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Industrial Health and Medical Programs

Margaret C. Klem
Margaret F. McKiever
Walter J. Lear, M. D.

P. H. S. Publication No. 15

FEDERAL SECURITY AGENCY

Public Health Service

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INDUSTRIAL HEALTH
and
MEDICAL PROGRAMS

*Statements, tables, and charts
selected and compiled*

by

Margaret C. Klem
Margaret F. McKiever
Walter J. Lear, M. D.

PUBLIC HEALTH SERVICE PUBLICATION No. 15



FEDERAL SECURITY AGENCY

Public Health Service

Division of Industrial Hygiene

WASHINGTON, D. C. • SEPTEMBER 1950

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. Price \$1.00

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Foreword

THE horizon of the field of industrial health has expanded in recent years from a circumscribed interest in the control of industrial health hazards to a comprehensive approach to the total health needs of the employed population.

This expanded concept has resulted from a growing recognition by management, labor, and the health professions of the great opportunities that the extension of all industrial health work offers for the prevention and early detection of illness, for the improvement of efficiency and productivity and for the reduction of losses caused by absenteeism for medical reasons.

To facilitate the work of the Public Health Service and that of other agencies and individuals working in this field, the Division of Industrial Hygiene has prepared this source book of information. It should be useful to all those concerned with any aspects of the health of working people.

Leonard A. Scheele
Surgeon General,
United States Public Health Service

Preface

ONE of the most important areas of the broad field of industrial health is the development, administration, and improvement of health and medical programs for industrial workers. Although much has been written about industrial health and medical programs, it is widely scattered in various journals, bulletins, and books. This reference book has been prepared to meet the need for a convenient compilation of published material on the subject.

The primary purpose of the compilation is to assist individuals either directly responsible for these programs or having a major interest in them, such as plant medical directors, company executives, industrial physicians and nurses, governmental industrial hygienists, trade union leaders, trade association officials, and public health officers.

The text consists entirely of direct quotations from the indicated sources. For ease in locating and using material, however, headings have been added to the text and some table forms have been rearranged. In selecting the material, statistical data were chosen wherever possible. Text appears where statistical data were not available. No original items are included in the book.

Limitations of space have permitted the selection of only that material which in general is Nation-wide in scope or is of Nation-wide interest because of its general application to the industrial field. For this reason, omission of a particular study or article should not be regarded as implying lack of importance or reliability. No information is included on the clinical aspects of occupational medicine or the technical aspects of industrial hygiene engineering and chemistry.

It is hoped that this compilation will bring into focus those important questions which do not have current reliable answers. The only available information in several areas is old, incomplete or primarily a matter of opinion. A more general recognition of these deficiencies should stimulate much needed research on this subject by all groups striving to improve the health of workers.

The material included in this source book was selected and compiled by Margaret C. Klem, Margaret F. McKiever, and Walter J.

▼

Lear, M. D., under the general supervision of J. J. Bloomfield, Assistant Chief, Division of Industrial Hygiene. They have asked me to express their appreciation to the many authors and publishers who have given permission to quote from their material as well as to individuals in the Division and elsewhere who made numerous constructive suggestions as to the contents and presentation of the material. They regret that time did not permit consultation with many other qualified individuals who would have been equally generous in their help. However, they will welcome all suggestions that will enhance the usefulness of this book if in the future a second edition is published.

A handwritten signature in cursive script, reading "J. G. Townsend". The letters are fluid and connected, with a prominent loop at the end of the last name.

*Medical Director,
Chief, Division of Industrial Hygiene*

Organization of Material

FOR the purpose of this reference book, data were selected from 260 books and publications. The tables and direct quotations from the text have been grouped in eight sections according to the character of the data presented.

The initial three sections provide background information about industry, the working population, the health of the worker, and the historical developments of the field of industrial health. The next three sections describe plant health and medical services—their type and extent, the professional personnel employed, and such other items as facilities and equipment, costs and savings. The two final sections concern other health and medical programs for industrial workers including general information on prepayment medical care plans, governmental industrial hygiene services, State disability insurance programs, and professional, research, and educational organizations engaged in industrial health activities.

Within each section, the material is arranged by subject matter. If there is both text and tabular material on a subject, the text comes first. Except for the addition of headings and the occasional insertion in brackets of a clarifying word or phrase, the text is made up entirely of direct quotations. The sources for the text follow immediately after each item. In some instances the tables have been rearranged or represent a combination of more than one table.

Considerable data have been taken from the several Nation-wide studies of general interest. In these instances the footnotes to the tables indicate the scope and period of the studies. In the case of studies of a more specialized character, only a few items have been selected as representative of the material available in these sources.

Contents

	Page
FOREWORD	III
PREFACE	V
ORGANIZATION OF MATERIAL	VII

Section I. NATIONAL INCOME, THE LABOR FORCE, TYPE AND SIZE OF INDUSTRIAL ESTABLISHMENTS

Income and Production

Recent Trends in Production.....	1
National Income by Industrial Classifications.....	2
Employee Earnings and Per Capita Income.....	2
Changing Living Standards.....	6

Total Population and the Labor Force

Population, Regional and Occupational Trends, 1900-1950.....	7
Urban-Rural Population Trends, 1930-1948.....	12
Civilian Labor Force.....	16
Factors Affecting the Employment of Women and Children.....	21
Older Workers.....	25
Workers in an Emergency Period.....	35

Work Establishments and Workers

Establishments and Workers by Size of Establishment..	38
Establishments by Type of Industry and Size of Establishment.....	39
Workers by Type of Industry and Size of Establishment..	41
Establishments and Workers by State and Region.....	44

Section II. INDUSTRIAL HEALTH AND MEDICINE IN THE U. S.—HISTORICAL DEVELOPMENT AND PRESENT SCOPE

Historical Development

Significant Events in Chronological Order.....	49
--	----

Definitions and Concepts

Selected Statements in Chronological Order.....	67
---	----

Section III. THE HEALTH STATUS OF THE WORKING POPULATION AND THE CLASSIFICATION OF INDUSTRIAL HEALTH HAZARDS

	Page
<i>Disability and Mortality in the General Population</i>	
Collection of Data on Illness and Disability	79
Factors Influencing the Disability Rate	80
National Estimates of Disability	82
Most Frequent Causes of Disabling Illness	90
Most Frequent Causes of Death	94
<i>Absenteeism and Mortality Among Industrial Workers</i>	
Factors Relating to Absenteeism	96
Number and Duration of Absences	99
Absences by Cause	102
Mortality in Occupational Groups	107
<i>Industrial Health Hazards</i>	
Classification of Hazards	111
Significant Materials to which Workers are Exposed	113
Occupational Disease Reporting	115

Section IV. TYPES AND EXTENT OF PLANT HEALTH AND MEDICAL SERVICES

<i>Plant Health and Medical Services</i>	
Basic Principles of Organization	119
Medical Services in the Small Plant	121
The Utilization of Services	139
Available Personnel and Services	143
In-Plant Medical Services by Prepayment Medical Care Plans	153
<i>Plant Environmental Health Services</i>	
Appraisal and Control of Industrial Health Hazards	155
Plant Industrial Hygiene Studies	157
Types of Plant Environmental Health Programs	159
<i>Plant Dental Services</i>	
Basic Principles of Plant Dental Services	167
Extent of Dental Programs in Industry	169
Dental Services in Small Plants	170
<i>Health Examinations and Job Placement Programs</i>	
Objectives of the Health Examination	172
Placement Physical Examination Program and Job Placement	172
Extent and Types of Health Examinations	179
Classification of Health Examination Findings	183
Labor-Management Aspects of Industrial Health Examinations	184

Section V. PROFESSIONAL PERSONNEL IN PLANT HEALTH AND MEDICAL SERVICES

Personnel and Relationships

	Page
Professional Personnel Employed	189
Professional Work-Time Experience	192
Relation to Top Management	194
Person in Direct Charge of Health Services	196
Interdepartmental Relationships	198
Relation to Workers	201

Physicians

Types of Industrial Physicians	207
Duties, Responsibilities, and Relationships	209
Qualifications	212
Ratio of Physicians to Employees	213
Industrial Physicians by State	215
Consultants in Medical Specialties	216

Nurses

Duties and Responsibilities	217
Qualifications	222
Industrial Nurses by Type of Experience	224
Ratio of Nurses to Employees	225
Industrial Nurses by State	227
Standing Orders	228

Industrial Hygiene Engineers, Chemists, Dentists, and Other Professional Personnel

Duties of Industrial Hygiene Engineers and Chemists . . .	229
Duties, Qualifications, and Relationships of Industrial Dentists	230
Ratio of Dental Personnel to Employees	233

Section VI. FACILITIES, EQUIPMENT, RECORDS, COSTS, AND VALUES OF PLANT HEALTH AND MEDICAL SERVICES

Facilities and Equipment

Location and Layout of Facilities	237
Establishments by Size and Type of Facilities	239
Examples of Floor Plans	241
Recommended Equipment	245

Records

Aims of Industrial Medical Records	249
Suggested Record and Report Forms	250
Establishments by Type of Records and Use of Data	252

<i>Costs and Values</i>	Page
Factors Influencing Costs	253
Per Capita Costs	254
Original Investment and Costs	265
Losses Due to Disability Among Workers	266
Benefits from Plant Health and Medical Services	268

Section VII. GENERAL MEDICAL CARE PLANS FOR INDUSTRIAL WORKERS

<i>General Medical Care Plans</i>	
Historical Basis	275
Types and Characteristics	277
Enrollment	282
Evaluation	284
<i>Medical Care and Other Employee-Benefit Plans</i>	
Health Provisions of Employee-Benefit Plans	288
Relationships between Industrial Health and Medical Care Plans	291
Characteristics of Industrial Medical Service Plans	293
Prepayment Industrial Dental Care Plans	296
Nursing Services in Prepayment Medical Care Plans	301
Health and Welfare Benefits Under Collective Bargaining	304

Section VIII. GOVERNMENTAL AND OTHER AGENCY INDUSTRIAL HEALTH, MEDICAL, AND DISABILITY PROGRAMS

<i>Governmental Industrial Hygiene Programs</i>	
History and Principles	321
Work of State and Local Industrial Hygiene Agencies	325
Duties and Qualifications of Governmental Industrial Hygiene Personnel	331
Legal Basis for State and Local Programs	339
Professional Personnel by States	343
State and Local Industrial Hygiene Agencies—Directors and Addresses	345
Federal Employee Health Program	348
<i>Governmental Disability Insurance Programs</i>	
Railroad Retirement Sickness Program	353
Relation of State Disability Programs to Occupational Health	359
Relation of State Disability Programs to Public Health	360
Statements of the American Medical Association on State Disability Programs	362
Comparison of State Temporary Disability Insurance Laws	364
Sick-Leave Provisions for Federal and State Employees	374

<i>Vocational Rehabilitation Program</i>	Page
Services Provided and Case Load.....	375
Expenditures and Savings.....	380
<i>Non-Governmental Agency Programs</i>	
Programs of Professional, Industrial, Research, and Educational Agencies.....	381
Professional and Health Organizations in the Industrial Health Field—Executive Officers and Addresses.....	385
Educational and Research Organizations in the Industrial Health Field—Executive Officers and Addresses.....	386
LIST OF REFERENCES.....	388

SECTION I

National Income, the Labor Force, Type and Size of Industrial Establishments

Income and Production

Recent Trends in Production

NINETEEN FORTY-NINE was another year of high production, income, and employment. The output of the economy was as large as in 1948 in real terms. . . .

GROSS national product—the market value of the Nation's output of goods and services—amounted to *\$256* billion in 1949, as compared with *\$259* billion in 1948. The national income, which measures output in terms of earnings accruing from current production, showed a similar movement, from *\$224* billion in 1948 to *\$217* billion in 1949. . . . Personal income, which measures all incomes received by persons, including transfers, [declined] from *\$210* billion to *\$206* billion.

Quoted from Department of Commerce, Office of Business Economics: "The Economy in Adjustment; A Review of 1949." *Survey of Current Business*, 30:1, 3 (February) 1950.

[Editor's Note: Figures in italics represent changes contained in the July 1950 Survey of Current Business.

GROSS national product—the Nation's total output of goods and services, valued at current market prices—rose to a rate of nearly \$270 billion annually in the second quarter of 1950, as compared with \$262½ billion in the first quarter. The advance was an extension of the upswing in economic activity already under way, and contrasted markedly with developments during the corresponding period a year ago. . . . Second-quarter economic developments did not, of course, reflect the new pressures introduced by our action to put down the aggression in Korea. . . .

The expansion of production during the quarter required additional employment sufficient both to absorb a considerable growth in the labor force and to cut back the numbers of unemployed by a substantial margin. This increase in employment was the principal factor underlying the second-quarter advance in earned personal income, although somewhat longer hours and higher wage rates, as well as larger nonfarm proprietors' incomes, also contributed.

Quoted from Department of Commerce, Office of Business Economics: "National Income and Product in the Second Quarter of 1950." *Survey of Current Business*, 30:6-7 (August) 1950.

National Income by Industrial Classifications

Table 1.—Distribution of national income, by major industrial division, United States, 1942-49

Industrial division	National income (in millions of dollars)							
	1942	1943	1944	1945	1946	1947	1948	1949
All industries, total.....	137, 119	169, 686	183, 838	182, 691	180, 286	198, 688	223, 466	216, 831
Agriculture, forestry, and fisheries.....	12, 875	14, 561	14, 830	15, 642	18, 251	19, 424	21, 825	17, 388
Mining.....	2, 599	2, 787	2, 950	2, 789	3, 071	4, 350	5, 277	4, 441
Contract construction.....	6, 625	5, 551	4, 375	4, 571	6, 851	8, 550	10, 458	10, 431
Manufacturing.....	45, 239	58, 104	60, 456	51, 918	48, 905	50, 459	67, 272	62, 870
Wholesale and retail trade.....	19, 055	22, 361	25, 137	27, 999	34, 137	37, 324	42, 870	42, 665
Finance, insurance, and real estate.....	11, 052	12, 237	13, 088	13, 278	14, 696	15, 666	17, 172	17, 678
Transportation.....	8, 462	10, 672	11, 197	10, 495	10, 182	11, 481	12, 751	11, 984
Communications and public utilities.....	3, 659	3, 852	4, 100	4, 283	4, 850	5, 157	5, 942	6, 601
Services.....	10, 870	11, 993	13, 268	14, 135	16, 614	18, 345	19, 823	20, 461
Government and Government enterprises.....	16, 445	27, 239	34, 211	37, 423	22, 647	18, 529	19, 629	21, 838
Rest of the world.....	238	259	226	158	282	403	447	464

Source: Department of Commerce: "Basic Data on the National Economy." Survey of Current Business, 30: 15 (July) 1960.

Employee Earnings

Table 2.—Distribution of wages and salaries and of supplements to wages and salaries, by major industrial division, United States, 1942-49

Industrial division	Amount for specified year (in millions of dollars)							
	1942	1943	1944	1945	1946	1947	1948	1949
Wages and salaries								
All industries, total.....	81, 887	105, 647	116, 924	117, 673	111, 227	122, 059	134, 357	134, 172
Agriculture, forestry, and fisheries.....	1, 786	2, 192	2, 398	2, 528	2, 798	3, 102	3, 354	3, 204
Mining.....	1, 769	1, 983	2, 197	2, 173	2, 368	2, 920	3, 340	2, 938
Contract construction.....	4, 670	3, 919	2, 888	2, 951	4, 412	5, 825	7, 093	6, 958
Manufacturing.....	30, 922	40, 883	42, 913	38, 229	36, 476	42, 500	46, 455	43, 885
Wholesale and retail trade.....	10, 958	11, 862	13, 016	14, 638	19, 529	22, 818	25, 318	25, 989
Finance, insurance, and real estate.....	2, 606	2, 725	2, 875	3, 141	3, 925	4, 292	4, 759	5, 058
Transportation.....	5, 260	6, 547	7, 525	7, 888	8, 478	9, 045	9, 664	9, 297
Communications and public utilities.....	1, 778	1, 886	1, 994	2, 209	2, 824	3, 286	3, 809	4, 043
Services.....	6, 039	6, 817	7, 643	8, 344	9, 767	11, 015	11, 867	12, 361
Government and Government enterprises.....	16, 089	26, 819	33, 463	35, 561	20, 633	17, 239	18, 683	20, 422
Rest of the world.....	10	14	12	11	17	17	15	17
Supplements to wages and salaries								
All industries, total.....	3, 008	3, 565	4, 239	5, 353	5, 871	5, 929	5, 830	6, 383
Employer contributions for social insurance.....	2, 302	2, 677	2, 937	3, 805	3, 970	3, 565	3, 061	3, 464
Other labor income.....	706	888	1, 302	1, 548	1, 901	2, 364	2, 769	2, 919
Agriculture, forestry, and fisheries.....	7	7	9	10	13	14	14	14
Mining.....	85	88	87	86	103	151	198	186
Contract construction.....	253	200	148	155	210	274	312	320
Manufacturing.....	1, 235	1, 662	1, 900	1, 791	1, 717	2, 069	2, 168	2, 169
Wholesale and retail trade.....	365	379	430	471	639	757	784	842
Finance, insurance, and real estate.....	126	138	155	154	210	222	259	287
Transportation.....	329	393	439	467	504	641	578	528
Communications and public utilities.....	118	130	159	184	245	279	322	355
Services.....	134	148	164	173	216	232	249	266
Government and Government enterprises.....	356	420	748	1, 862	2, 014	1, 290	946	1, 416
Rest of the world.....	0	0	0	0	0	0	0	0

Source: Department of Commerce: "Basic Data on the National Economy." Survey of Current Business, 30: 9, 15, 16 (July) 1950.

Table 3.—Average annual earnings per full-time employee, by major industrial division, United States, 1942-49

Industrial division	Average annual earnings (in dollars)							
	1942	1943	1944	1945	1946	1947	1948	1949
All industries, total.....	1,719	1,964	2,120	2,207	2,368	2,598	2,809	2,869
Agriculture, forestry, and fisheries...	670	863	1,013	1,138	1,223	1,311	1,375	1,341
Mining.....	1,796	2,162	2,499	2,621	2,719	3,113	3,387	3,204
Contract construction.....	2,191	2,503	2,602	2,600	2,537	2,828	3,119	3,239
Manufacturing.....	2,023	2,349	2,517	2,517	2,517	2,793	3,039	3,093
Wholesale and retail trade.....	1,620	1,796	1,965	2,135	2,403	2,661	2,867	2,941
Finance, insurance, and real estate.....	1,911	2,064	2,212	2,369	2,598	2,764	2,958	3,084
Transportation.....	2,180	2,489	2,678	2,733	2,948	3,147	3,442	3,555
Communications and public utilities.....	1,883	2,075	2,248	2,425	2,567	2,792	3,002	3,156
Services.....	1,131	1,337	1,519	1,669	1,870	2,002	2,111	2,174
Government and Government enterprises.....	1,653	1,813	1,958	2,097	2,364	2,568	2,786	2,892
Rest of the world.....	2,100	2,100	2,200	2,400	3,400	3,400	3,000	2,833

Sources: Department of Commerce: "Basic Data on National Economy." Survey of Current Business, 30; 22 (July) 1950.

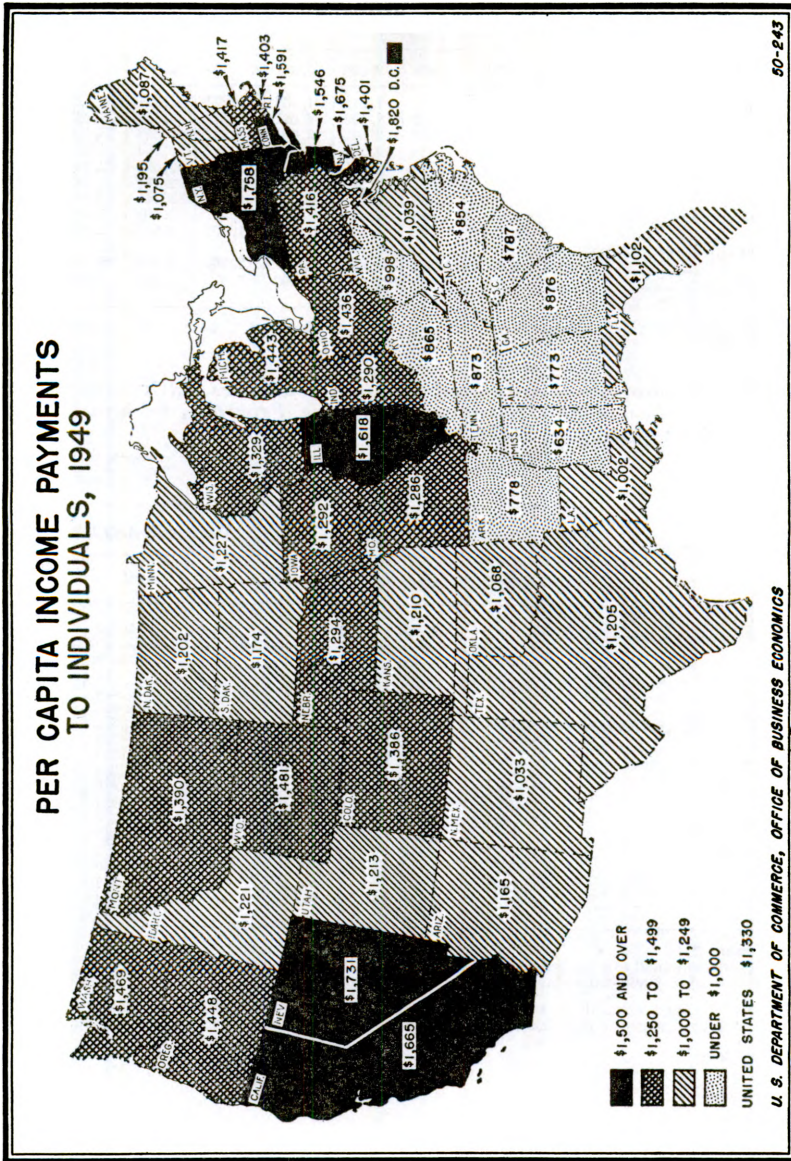
Table 4.—Distribution of estimated number of workers, with wage credits under the Old-age and Survivors Insurance Program, by annual wage credit and sex of worker, 1947¹

Amount of annual wage credit ²	Workers					
	Number (in thousands)			Percentage distribution		
	Both sexes	Male	Female	Both sexes	Male	Female
Total.....	48,900	32,800	16,100	100.0	100.0	100.0
\$1 to \$199.....	6,550	3,350	3,200	13.4	10.2	19.9
\$200 to \$399.....	3,850	2,000	1,850	7.9	6.1	11.5
\$400 to \$599.....	3,000	1,650	1,350	6.1	5.0	8.4
\$600 to \$799.....	2,500	1,400	1,100	5.1	4.3	6.8
\$800 to \$999.....	2,200	1,200	1,000	4.5	3.7	6.2
\$1,000 to \$1,199.....	2,200	1,150	1,050	4.5	3.5	6.5
\$1,200 to \$1,399.....	2,300	1,200	1,100	4.7	3.7	6.8
\$1,400 to \$1,599.....	2,300	1,250	1,050	4.7	3.8	6.5
\$1,600 to \$1,799.....	2,300	1,300	1,000	4.7	4.0	6.2
\$1,800 to \$1,999.....	2,350	1,450	900	4.8	4.4	5.6
\$2,000 to \$2,199.....	2,250	1,500	750	4.6	4.6	4.7
\$2,200 to \$2,399.....	2,100	1,550	550	4.3	4.7	3.4
\$2,400 to \$2,599.....	1,950	1,600	350	4.0	4.9	2.2
\$2,600 to \$2,799.....	1,900	1,650	250	3.9	5.0	1.6
\$2,800 to \$2,999.....	1,750	1,550	200	3.6	4.7	1.2
\$3,000.....	9,400	9,000	400	19.2	27.4	2.5

¹ Preliminary data.

² Taxable wages which can be included in computing a primary benefit amount; i. e., wages up to \$3,000 received by a worker during calendar year.

Source: Social Security Administration, Bureau of Old-Age and Survivors Insurance: Handbook of Old-Age and Survivors Insurance Statistics, 1947. Washington, Government Printing Office, 1950, pp. 47-49.



Source: Schwartz, Charles F., and Graham, R. E. Jr.: "State Income Payments in 1949." Survey of Current Business, 30:20 (August) 1950.

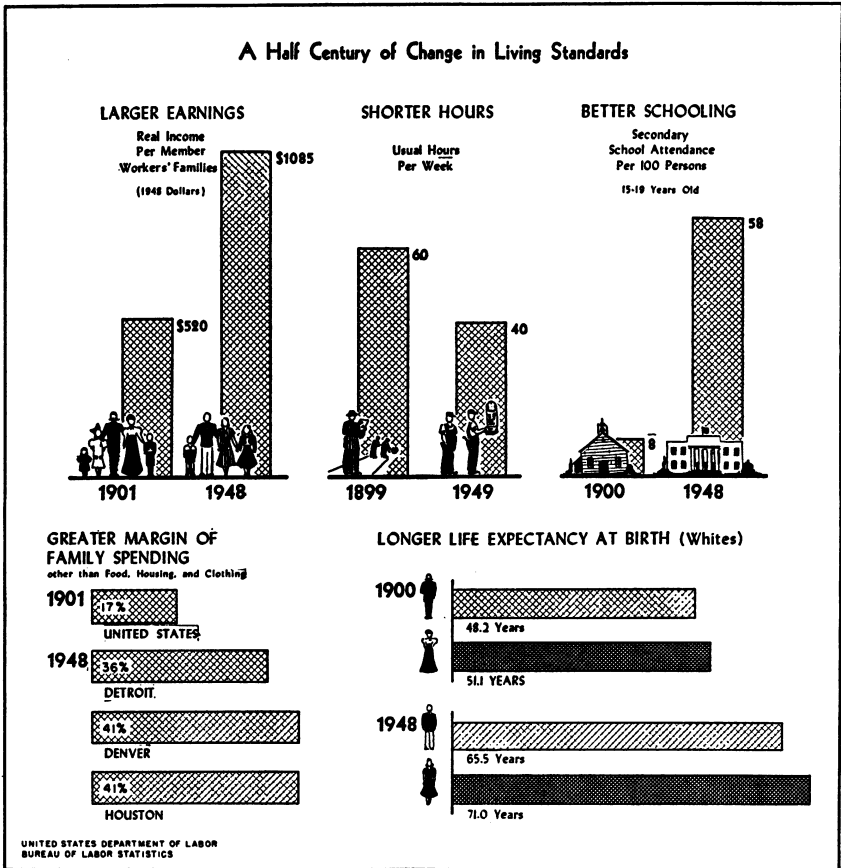
FIGURE 1.

Table 5.—Per capita income payments, by State and region, for specified years 1929–49

State and region	Amount for specified year (in dollars)											
	1929	1933	1937	1941	1942	1943	1944	1945	1946	1947	1948	1949
Continental United States	680	368	561	693	876	1,059	1,161	1,192	1,212	1,294	1,387	1,330
New England	628	514	704	872	1,059	1,222	1,299	1,309	1,312	1,371	1,456	1,395
Connecticut	918	540	808	1,069	1,312	1,496	1,538	1,495	1,468	1,594	1,680	1,591
Maine	566	364	490	575	777	1,021	1,040	1,040	1,043	1,096	1,162	1,087
Massachusetts	897	553	737	888	1,050	1,217	1,297	1,332	1,345	1,376	1,468	1,417
New Hampshire	652	420	562	670	803	948	1,048	1,085	1,115	1,151	1,254	1,195
Rhode Island	851	533	714	917	1,143	1,246	1,322	1,288	1,282	1,373	1,453	1,403
Vermont	601	351	493	620	738	884	956	1,018	1,048	1,072	1,163	1,075
Middle East	926	526	740	872	1,041	1,241	1,362	1,412	1,433	1,502	1,608	1,565
Delaware	919	513	795	1,007	1,184	1,367	1,409	1,400	1,450	1,523	1,618	1,675
District of Columbia	1,191	806	1,107	1,076	1,194	1,270	1,263	1,373	1,557	1,623	1,713	1,820
Maryland	703	441	635	845	1,087	1,297	1,348	1,340	1,316	1,392	1,485	1,401
New Jersey	947	535	750	924	1,130	1,336	1,439	1,451	1,448	1,524	1,694	1,546
New York	1,125	644	861	992	1,158	1,376	1,534	1,614	1,622	1,676	1,803	1,758
Pennsylvania	767	414	629	752	909	1,101	1,208	1,237	1,277	1,352	1,454	1,416
West Virginia	464	265	417	473	581	703	799	878	884	994	1,085	998
Southeast	344	195	310	403	537	674	767	811	806	863	923	882
Alabama	305	154	256	365	504	633	706	745	718	787	834	773
Arkansas	305	152	249	338	476	542	639	702	730	745	863	778
Florida	484	272	445	521	684	899	1,015	1,062	1,085	1,103	1,129	1,102
Georgia	329	200	301	387	510	673	762	805	794	873	919	876
Kentucky	371	199	325	371	482	621	701	769	772	830	910	865
Louisiana	415	222	346	432	565	741	822	837	790	864	961	1,002
Mississippi	273	123	207	278	392	479	572	596	589	676	763	634
North Carolina	309	205	312	392	513	619	709	759	796	857	887	854
South Carolina	252	167	262	358	478	589	671	699	735	768	844	787
Tennessee	349	190	311	410	521	674	808	876	827	869	906	873
Virginia	422	266	405	567	753	880	960	974	958	1,025	1,088	1,039
Southwest	464	247	397	486	666	833	950	956	946	1,068	1,112	1,166
Arizona	573	263	452	537	748	839	985	1,063	1,059	1,121	1,179	1,165
New Mexico	383	196	363	410	552	691	797	851	851	947	995	1,033
Oklahoma	455	226	358	462	645	728	906	862	852	958	1,035	1,068
Texas	465	257	409	495	674	877	971	985	973	1,107	1,137	1,205
Central	720	355	589	748	939	1,132	1,217	1,249	1,275	1,358	1,508	1,414
Illinois	932	431	691	871	1,042	1,226	1,341	1,417	1,463	1,527	1,722	1,618
Indiana	583	296	608	706	897	1,092	1,177	1,217	1,167	1,264	1,389	1,290
Iowa	546	258	434	611	827	1,019	1,017	1,067	1,202	1,158	1,607	1,292
Michigan	745	348	659	799	1,032	1,276	1,338	1,273	1,274	1,419	1,493	1,443
Minnesota	566	307	600	587	764	896	972	1,062	1,133	1,205	1,340	1,227
Missouri	612	337	458	619	763	910	1,026	1,085	1,141	1,179	1,339	1,286
Ohio	748	386	646	816	1,015	1,234	1,292	1,297	1,296	1,401	1,534	1,436
Wisconsin	634	312	510	654	847	1,007	1,131	1,189	1,203	1,299	1,400	1,329
Northwest	534	265	438	559	837	982	1,088	1,141	1,154	1,336	1,412	1,273
Colorado	616	336	532	602	862	963	1,025	1,172	1,185	1,420	1,459	1,386
Idaho	518	242	444	539	823	935	1,025	1,107	1,185	1,303	1,283	1,221
Kansas	532	258	430	546	839	1,025	1,129	1,111	1,075	1,268	1,270	1,210
Montana	602	290	541	670	889	1,075	1,208	1,270	1,349	1,578	1,696	1,390
Nebraska	557	275	412	514	844	977	1,110	1,142	1,167	1,231	1,468	1,294
North Dakota	389	190	333	536	742	938	1,079	1,120	1,130	1,588	1,528	1,202
South Dakota	417	172	306	491	823	830	1,050	1,156	1,203	1,315	1,592	1,174
Utah	537	275	459	576	868	1,068	1,061	1,089	1,066	1,184	1,220	1,213
Wyoming	687	369	560	654	783	929	1,071	1,175	1,269	1,438	1,493	1,481
Far West	865	465	714	903	1,164	1,441	1,536	1,496	1,570	1,642	1,669	1,610
California	946	511	769	951	1,180	1,470	1,564	1,516	1,653	1,719	1,743	1,665
Nevada	817	447	733	899	1,649	1,483	1,430	1,558	1,732	1,809	1,594	1,731
Oregon	640	337	552	722	1,035	1,269	1,375	1,396	1,414	1,516	1,662	1,448
Washington	713	369	597	824	1,150	1,423	1,518	1,407	1,321	1,398	1,441	1,469

Source: Schwartz, Charles F., and Graham, R. E. Jr.: "State Income Payments in 1949." Survey of Current Business, 30:20 (August) 1950.

Changing Living Standards



Source: Bowden Witt: "Changes in Modes of Living." Monthly Labor Review, 71:27 (July) 1950.

FIGURE 2.

Total Population and the Labor Force

The total population in continental United States was 150,500,000 on April 1, 1950, Secretary of Commerce Charles Sawyer announced in reporting the preliminary figures of the Seventeenth Decennial Census taken by the Bureau of the Census.

The preliminary 1950 total is almost 19 million greater than the 1940 census total of 131,669,275. This represents the greatest numerical gain for any decade in American history. The Nation's population approximately doubled in 50 years, the 1900 census having enumerated 75,995,575 persons. . . .

The combined population gain of the three Pacific Coast States, California, Oregon, and Washington, amounted to about 4.6 million and represents approximately one-fourth of the Nation's entire increase in an area with less than 10 percent of the country's total population. The most rapidly growing single State was California, which had a population increase of about 51.6 percent. Other States with increases of more than one-third were Arizona with a gain of 48.7 percent, Florida with 44.1 percent, Nevada with 43.7 percent, Oregon with 38.6 percent, and Washington with 36 percent. The leading States in numerical growth of population were California with a gain of about 3,565,000, New York with about 1,264,000, Texas with about 1,262,000, and Michigan with about 1,078,000. . . .

The very large national increase in population during the decade resulted largely from an increase in the birth rate, chiefly due to the great number of wartime marriages, and the decline in the death rate which has brought longer life span. Immigration was only a minor factor in the increase.

Regional movements of the population during the decade reflected plainly the effect of World War II, economic prosperity, migration of workers to industrial centers, and technological development in the great agriculture areas where mechanization has released farm population for jobs in the industrial areas.

Quoted from Bureau of the Census: 1950 Census Enumerated 150.5 Million Persons in the United States. Release (July 22) 1950.

Population, Regional and Occupational Trends, 1900-1950

Regional Shifts in Industry and Population

Shifts of economic activity and movements of population during the last 50 years have favored the South and West, broadly speaking, at the expense of older industrial areas north of the Ohio and Potomac Rivers. So much has been written about this trend, however, that

it is easy to exaggerate its importance. The most startling percentage increases have indeed occurred in the newer industrial areas. But, as shown in the chart and table, the numbers involved are not great as compared with the North. It is there that the big numerical rises have taken place.

As a result of rapid industrial growth, there were in 1947 some 84 manufacturing production workers per thousand of the population, compared with only 59 at the turn of the century. This greater emphasis on manufacturing was evident in every region except New England, although outside the North the actual numbers were not great (from 28 to 60 per thousand population). However, New England remains the region of greatest manufacturing concentration, with 137 production workers per thousand of the population—far more than elsewhere. . . .

Fifty years ago, well over half the country's manufacturing employment was located in New England and the Middle Atlantic States. The Central region had more than a fourth of the production workers, the Southeast had 12 percent. Across the other three regions, occupying three-fifths of the Nation's area, were scattered hardly more than a twentieth of the factory jobs. . . .

From 1899 to 1939, when manufacturing employment in the Nation rose by nearly 75 percent, the Southwest and the far West more than tripled their number of factory jobs, and the Southeast and the Central region nearly doubled theirs. The Middle Atlantic region gained 40 percent, New England comparatively little. . . .

Factory employment increased more than 50 percent between 1939 and 1947. Again the West gained most, proportionately. The Southeast with its emphasis on light manufactures, especially textiles, was not a big gainer. The Middle Atlantic States increased their number of jobs more in 8 years than over the previous 40, yet less than the national average. New England's 32-percent rise—a large number in the space of 8 years, and three times the 1899-1939 increase—still was smaller than that of any other region. By far the greatest gain, in actual number of jobs, took place in the Central States, the location of so much of the Nation's heavy industry.

By 1947, both the Central States and the Southeast had three times as many manufacturing production workers as in 1899. The Southwest and the Far West had no less than six times as many. Meanwhile employment doubled in the Middle Atlantic States, and increased by less than half in New England.

Since 1947, as before, the West has done better industrially than the East and North. . . . Thus, in each of the three periods considered, the Southwest and the Far West did better than other areas, and New England and to some extent the Middle Atlantic States did worse. . . .

Table 6.—Regional shifts in the population and in industry, United States, for specified periods, 1899–1949¹

Region	Population			Manufacturing								Manufacturing production workers per thousand population	
	Percent of total		Percent increase 1900–1949	Production workers ²						All employees		1899–1900	1947
	1900	1949		Number (in thousands)		Percent of total		Percent change ³		Percent of total September 1949	Percent change September 1947–September 1949 ³		
				1899	1947	1899	1947	1899–1939	1939–1947				
United States.....	100.0	100.0	95.7	4,502	11,916	100.0	100.0	73.4	52.6	100.0	-7.2	59	84
New England.....	7.4	6.3	66.3	852	1,248	18.1	10.5	11.2	31.8	9.4	-13.2	152	137
Middle Atlantic.....	23.8	23.7	94.8	1,759	3,583	37.3	30.1	40.8	44.6	29.6	-9.3	97	104
Central.....	30.4	26.7	72.0	1,290	4,093	27.4	34.3	93.7	63.7	34.0	-8.8	56	106
Southeast.....	23.8	20.5	68.4	654	1,736	11.8	14.6	115.9	45.1	14.2	-7.2	31	60
Southwest.....	5.5	7.5	168.7	47	304	1.0	2.5	247.4	87.7	3.0	.5	11	29
Northwest.....	6.0	5.2	70.2	88	205	1.9	1.7	30.2	79.6	2.1	.6	19	28
Far West.....	3.2	10.2	516.4	124	748	2.6	6.3	233.1	81.5	7.7	1.6	50	55

¹ Based on Bureau of Labor Statistics, Handbook of Regional Statistics.

² The national production worker figure for 1899 has been revised to exclude workers in railroad repair shops, the manufactured gas industry, and some other industries which are no longer counted as manufacturing. As similar adjustments could not be made in regional and State figures, regional data for 1899 are not entirely comparable to those for 1939 and 1947, and their sum is greater than the national total shown. Certain additional reasons for a lack of complete comparability are presented in the Handbook. None of these difficulties, however, are great enough to vitiate the kinds of comparisons being made here.

³ Increase, except as otherwise indicated.

Source: Hayes, Marlon: "Regional Shifts in Industry and Population, 1899–1949." Monthly Labor Review, 71:106–108 (July) 1950.

The net result of these differential changes in manufacturing employment has been to bring the three western regions up from 6 percent of the national total of factory jobs in 1899 to 13 percent in 1949. The Southeast has gained only slightly, from 12 percent to 14. The Central States by 1949 had 34 percent of the total as compared with 27 percent 50 years before. Meanwhile New England, despite a large absolute rise, had only 9 percent of the total, compared with 18 percent in 1899. The Middle Atlantic Region was down from 37 to 30 percent.

At the turn of the century, then, the industrial North had more than four-fifths of the jobs in manufacturing, the more recently industrialized South and West had less than a fifth. Fifty years later the South and West had climbed to more than a fourth. But the North still had nearly three-quarters of all manufacturing employment, and remained the area of most of the Nation's industrial activity. Two-thirds of the new jobs created between 1899 and 1947 were added in the older industrial regions. . . .

Despite differing trends—into and then out of agricultural States, from rural into urban areas, from South to North and from the East to the West—every region had more residents in 1949 than in 1900.

The population of the Southwest has nearly tripled, and that of the Far West has been multiplied by 6. By 1949, 1 in 10 Americans—15 million people—lived in the Far West. The Middle Atlantic region meanwhile has maintained its relative position. It still has a little less than a fourth of the Nation's population, just as it had at the turn of the century. Together, the three regions above the Ohio and Potomac Rivers hold a somewhat smaller share of the population than 50 years ago. But they still have nearly three-fifths of the total, concentrated in a fifth of the area of the country:

Quoted from Hayes, Marion: "Regional Shifts in Industry and Population, 1899-1949." Monthly Labor Review, 71:106-108 (July) 1950.

Table 7.—Percentage distribution of the labor force by age group, United States, for specified years 1890-1950

Year	Percentage distribution of the labor force				
	Total, 14 years and over	14-24	25-44	45-64	65 years and over
Adjusted decennial census data ¹					
1890 (June).....	100	30.9	44.6	20.2	4.3
1900 (June).....	100	30.9	44.7	20.4	4.0
1920 (January).....	100	25.9	46.3	23.8	3.9
1930 (April).....	100	23.9	46.7	25.1	4.3
1940 (April).....	100	22.0	46.8	27.2	4.0
Comparable to current MRLF ²					
1940 (April).....	100	22.3	46.6	27.1	4.1
1945 (April).....	100	25.2	43.3	27.1	4.4
1950 (April).....	100	19.7	45.6	29.9	4.8

¹ From John D. Durand, *The Labor Force in the United States, 1890-1960*, Social Science Research Council, 1948.

² Adapted from the U. S. Bureau of the Census, *Monthly Report on the Labor Force*.

Source: Department of Labor, Bureau of Labor Statistics: *Fact Book on Employment Problems of Older Workers*. Washington, The Department, 1950, p. 14. (Prepared for the National Conference on Aging, Aug. 13-15, 1950.)

Table 8.—Total population in continental United States, by State, 1900, 1940, and 1950¹

State	Number of persons		
	1950	1940	1900
Alabama.....	3,052,395	2,832,961	1,828,697
Arizona.....	742,364	499,261	122,931
Arkansas.....	1,900,246	1,949,387	1,311,564
California.....	10,472,348	6,907,387	1,485,053
Colorado.....	1,315,206	1,123,296	539,700
Connecticut.....	1,994,818	1,709,242	908,420
Delaware.....	316,709	266,505	184,735
District of Columbia.....	792,234	663,091	278,718
Florida.....	2,734,086	1,897,414	528,542
Georgia.....	3,418,120	3,123,723	2,216,331
Idaho.....	586,037	524,873	161,772
Illinois.....	8,696,490	7,897,241	4,821,550
Indiana.....	3,917,904	3,427,796	2,516,462
Iowa.....	2,609,748	2,538,268	2,231,853
Kansas.....	1,898,519	1,801,028	1,470,495

See footnote at end of table.

Table 8.—Total population in continental United States, by State, 1900, 1940, and 1950¹—Continued

State	Number of persons		
	1950	1940	1900
Kentucky.....	2,931,588	2,845,627	2,147,174
Louisiana.....	2,669,043	2,363,880	1,381,625
Maine.....	907,205	847,226	694,466
Maryland.....	2,322,657	1,821,244	1,188,044
Massachusetts.....	4,711,753	4,316,721	2,805,346
Michigan.....	6,334,172	5,256,106	2,420,982
Minnesota.....	2,967,210	2,792,300	1,751,394
Mississippi.....	2,171,806	2,183,796	1,551,270
Missouri.....	3,924,220	3,784,664	3,106,665
Montana.....	587,196	559,456	243,329
Nebraska.....	1,317,566	1,315,834	1,066,300
Nevada.....	158,378	110,247	42,335
New Hampshire.....	529,881	491,524	411,588
New Jersey.....	4,821,880	4,160,165	1,883,669
New Mexico.....	677,099	531,818	195,310
New York.....	14,743,210	13,479,142	7,268,894
North Carolina.....	4,034,858	3,571,623	1,863,810
North Dakota.....	616,185	641,935	319,146
Ohio.....	7,901,791	6,907,612	4,157,545
Oklahoma.....	2,230,253	2,336,434	790,391
Oregon.....	1,510,148	1,089,684	413,536
Pennsylvania.....	10,435,965	9,900,180	6,302,155
Rhode Island.....	786,324	713,346	428,556
South Carolina.....	2,107,813	1,899,804	1,340,316
South Dakota.....	650,025	642,961	401,570
Tennessee.....	3,280,575	2,915,841	2,020,616
Texas.....	7,677,060	6,414,824	3,048,710
Utah.....	686,842	550,310	276,749
Vermont.....	375,786	359,231	343,641
Virginia.....	3,247,781	2,677,773	1,854,184
Washington.....	2,361,261	1,736,191	518,103
West Virginia.....	1,998,536	1,901,974	958,800
Wisconsin.....	3,417,372	3,137,587	2,069,042
Wyoming.....	288,707	250,742	92,531

¹ 1950 figures are preliminary.

Source: Bureau of the Census: 1950 Census Enumerated 150.5 Million Persons in the United States. Release (July 22) 1950.

Occupational Trends

In a country such as ours, where freedom of occupational choice is implicit, there are, nevertheless, certain limits in the matter of occupational choice. These are determined by the industrial composition of the economy and the kinds of work that result from it. By 1900, the essential elements of mass production had already been developed and applied in various industries. Since 1900, there has been a growth and greater systematic application of mass production and a rationalization of labor processes. These, in turn, resulted in marked changes in the occupational composition of the Nation's employment opportunities.

While data regarding occupations are available on a comparable basis only since 1910, they indicate the major trends for the entire

half century. Broadly, these data show a substantial increase in the proportion of workers in semiskilled occupations; a sharp decline in the proportion engaged in farming; an increase in importance of the professional and clerical occupations; and a sharp decline in the proportion of the labor force engaged in laboring occupations. The number employed in skilled trades, on the other hand, showed only a slight relative increase. . . .

One of the outstanding changes in the labor supply since 1900 is that immigration, which was extensive in the early 1900's, was sharply reduced in recent years. At the turn of the century, each year brought a flood of immigrants to our shores—over 1¼ million in 1907 alone. Today, mainly as a result of legislative curbs, immigration has been reduced to a trickle. . . .

Important as immigration was in supplying labor, it was by no means the only source of potential new labor. During the past 50 years, women have increasingly sought gainful work. In 1900, for example, women 14 years old and over constituted 18 percent of the labor force and in 1947 about 28 percent. . . . The employment of women in industry, however, is still primarily confined to the semi-skilled and unskilled occupations. . . .

The past 50 years have witnessed extensive mechanization and improvements in farm methods. These have resulted in increased productivity and increased availability of farmers for industrial employment. In fact, because of the higher birth rate on farms and the continued decline in farm labor requirements, the farm population has become a major source of industrial labor supply. . . .

Improvements in schooling and in the general social outlook and material well-being of the population since 1900, on the other hand, have resulted in keeping children out of the labor market longer. . . . In 1900, there were 121 children per 1,000 of the ages 10 to 13 at work; in 1930, only 24 in 1,000. . . .

In 1948, the United States labor force of over 60 million persons included more than 2 million young persons 14 through 17 years of age actually employed. Agriculture is still the major single field of employment of young workers. Manufacturing provides few employment opportunities for children today. In general, the portion of the labor force supplied by the youth of our country is not as large today as it was in 1900.

Quoted from Ober, Harry: "The Worker and His Job." *Monthly Labor Review*, 71:13, 15-16 (July) 1950.

Urban-Rural Population Trends 1930-48

Proportional distribution of the total population of the United States remained fairly constant between 1930 and 1940. Significant internal shifts of population from relatively rural counties to urban counties occurred between 1940 and 1948, however. The percentage

of the population living in the least rural counties (under 10 percent) increased from 45.5 in 1940 to 48.1 in 1948. Furthermore, the percentage of the population living in counties whose population was half or more rural-farm decreased from 18.2 in 1940 to 15.5 in 1948.

This movement away from the farm was undoubtedly intensified by World War II and the processes of industrialization. Although the over-all total population of the United States increased considerably between 1930 and 1948, all rurality classes above 50 percent rural-farm had smaller population figures in 1948 than in 1930. This reflects clearly the internal movement of population from farm to cities.

Quoted from Flagg, Grace L. and Longmore, T. Wilson: Trends in Rural and Urban Levels of Living (Agricultural Information Bulletin No. 11). Washington, Department of Agriculture, Bureau of Agricultural Economics, 1949, page 6.

Table 9.—Percentage distribution of the population according to rural-farm county classification, for each region, United States, specified years 1930–48¹

Region and county classification	Percentage distribution of population			
	1930	1940	1943	1948
UNITED STATES				
Total population (in thousands).....	122, 775	131, 669	127, 308	143, 823
Total percent.....	100. 0	100. 0	100. 0	100. 0
County classification:				
Under 10 percent rural-farm.....	45. 3	45. 5	47. 8	48. 1
10 to 19 percent rural-farm.....	12. 4	12. 9	13. 4	13. 6
20 to 29 percent rural-farm.....	8. 0	8. 1	8. 0	8. 1
30 to 39 percent rural-farm.....	8. 1	8. 1	7. 9	8. 0
40 to 49 percent rural-farm.....	7. 3	7. 2	6. 7	6. 7
50 to 59 percent rural-farm.....	7. 1	6. 8	6. 2	6. 0
60 to 69 percent rural-farm.....	6. 3	6. 1	5. 3	5. 1
70 to 79 percent rural-farm.....	3. 9	3. 8	3. 4	3. 2
80 to 89 percent rural-farm.....	1. 5	1. 4	1. 2	1. 1
90 and over percent rural-farm.....	. 1	. 1	. 1	. 1
NEW ENGLAND				
Total population (in thousands).....	8, 166	8, 437	8, 088	9, 376
Total percent.....	100. 0	100. 0	100. 0	100. 0
County classification:				
Under 10 percent rural-farm.....	78. 8	78. 6	79. 4	79. 1
10 to 19 percent rural-farm.....	13. 8	14. 1	14. 0	14. 2
20 to 29 percent rural-farm.....	2. 7	2. 7	2. 4	2. 5
30 to 39 percent rural-farm.....	3. 4	3. 3	3. 1	3. 1
40 to 49 percent rural-farm.....	. 8	. 8	. 7	. 7
50 to 59 percent rural-farm.....	. 5	. 5	. 4	. 4
MIDDLE ATLANTIC				
Total population (in thousands).....	26, 261	27, 539	25, 797	28, 949
Total percent.....	100. 0	100. 0	100. 0	100. 0
County classification:				
Under 10 percent rural-farm.....	78. 2	78. 1	78. 2	78. 8
10 to 19 percent rural-farm.....	9. 6	9. 6	9. 9	9. 4
20 to 29 percent rural-farm.....	8. 7	8. 7	8. 5	8. 4
30 to 39 percent rural-farm.....	2. 7	2. 8	2. 7	2. 6
40 to 49 percent rural-farm.....	. 8	. 8	. 7	. 8
50 to 59 percent rural-farm.....				
60 to 69 percent rural-farm.....				
	(¹)	(²)	(³)	(⁴)

See footnotes at end of table.

Table 9.—Percentage distribution of the population according to rural-farm county classification, for each region, United States, specified years 1930-1948¹—Continued

Region and county classification	Percentage distribution of population			
	1930	1940	1943	1948
EAST NORTH CENTRAL				
Total population (in thousands).....	25,297	26,626	26,098	29,579
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	49.4	49.1	51.2	50.5
10 to 19 percent rural-farm.....	16.6	16.8	17.0	17.4
20 to 29 percent rural-farm.....	9.1	9.2	8.8	9.0
30 to 39 percent rural-farm.....	9.8	9.7	9.1	9.2
40 to 49 percent rural-farm.....	7.6	7.6	7.1	7.1
50 to 59 percent rural-farm.....	5.0	5.1	4.6	4.6
60 to 69 percent rural-farm.....	2.1	2.1	1.9	1.9
70 to 79 percent rural-farm.....	.4	.4	.3	.3
WEST NORTH CENTRAL				
Total population (in thousands).....	13,297	13,517	12,263	13,766
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	22.5	23.5	26.4	26.5
10 to 19 percent rural-farm.....	9.1	9.4	9.5	9.8
20 to 29 percent rural-farm.....	9.0	9.1	9.4	9.7
30 to 39 percent rural-farm.....	10.7	10.7	10.6	10.8
40 to 49 percent rural-farm.....	13.2	13.1	12.5	12.5
50 to 59 percent rural-farm.....	19.2	18.5	17.3	16.8
60 to 69 percent rural-farm.....	13.0	12.4	11.4	11.1
70 to 79 percent rural-farm.....	2.8	2.8	2.5	2.4
80 to 89 percent rural-farm.....	.5	.5	.4	.4
90 and over percent rural-farm.....	(?)	(?)	(?)	(?)
SOUTH ATLANTIC				
Total population (in thousands).....	15,794	17,823	17,701	19,462
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	23.8	25.7	29.8	31.5
10 to 19 percent rural-farm.....	14.6	15.3	16.0	15.1
20 to 29 percent rural-farm.....	7.9	8.0	7.8	7.8
30 to 39 percent rural-farm.....	9.6	9.5	9.2	9.3
40 to 49 percent rural-farm.....	10.2	9.9	9.2	9.1
50 to 59 percent rural-farm.....	10.0	9.5	8.6	8.4
60 to 69 percent rural-farm.....	10.8	10.0	8.9	8.6
70 to 79 percent rural-farm.....	9.3	8.6	7.6	7.4
80 to 89 percent rural-farm.....	3.7	3.4	2.8	2.7
90 and over percent rural-farm.....	.1	.1	.1	.1
EAST SOUTH CENTRAL				
Total population (in thousands).....	9,887	10,778	10,082	10,788
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	15.6	15.6	18.2	18.3
10 to 19 percent rural-farm.....	7.4	7.8	8.7	9.0
20 to 29 percent rural-farm.....	3.8	4.0	4.3	4.6
30 to 39 percent rural-farm.....	7.7	7.9	8.1	8.2
40 to 49 percent rural-farm.....	9.5	9.8	10.1	10.2
50 to 59 percent rural-farm.....	10.4	10.3	10.0	10.0
60 to 69 percent rural-farm.....	15.2	14.8	13.7	13.5
70 to 79 percent rural-farm.....	19.7	19.2	17.6	17.1
80 to 89 percent rural-farm.....	10.0	9.8	8.7	8.5
90 and over percent rural-farm.....	.7	.8	.6	.6

See footnotes at end of table.

Table 9.—Percentage distribution of the population according to rural-farm county, classification, for each region, United States, specified years 1930-1948¹—Continued

Region and county classification	Percentage distribution of population			
	1930	1940	1943	1948
WEST SOUTH CENTRAL				
Total population (in thousands).....	12,177	13,065	12,300	13,868
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	21.4	23.3	27.3	27.4
10 to 19 percent rural-farm.....	6.6	8.0	8.9	9.5
20 to 29 percent rural-farm.....	5.9	5.9	6.3	6.2
30 to 39 percent rural-farm.....	10.7	10.5	10.2	10.2
40 to 49 percent rural-farm.....	13.5	12.7	11.9	12.0
50 to 59 percent rural-farm.....	15.0	14.1	12.9	12.6
60 to 69 percent rural-farm.....	18.1	17.0	15.0	14.8
70 to 79 percent rural-farm.....	7.4	7.1	6.3	6.1
80 to 89 percent rural-farm.....	1.3	1.3	1.1	1.1
90 and over percent rural-farm.....	.1	.1	.1	.1
MOUNTAIN				
Total population (in thousands).....	3,702	4,150	4,020	4,402
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	22.9	22.7	25.1	25.3
10 to 19 percent rural-farm.....	17.5	17.7	18.2	18.4
20 to 29 percent rural-farm.....	17.8	18.6	19.0	20.2
30 to 39 percent rural-farm.....	13.8	14.1	13.6	13.1
40 to 49 percent rural-farm.....	14.6	14.3	12.9	12.6
50 to 59 percent rural-farm.....	9.7	9.3	8.5	7.8
60 to 69 percent rural-farm.....	2.5	2.3	2.0	1.9
70 to 79 percent rural-farm.....	1.2	1.0	.7	.7
PACIFIC				
Total population (in thousands).....	8,194	9,733	10,960	13,634
Total percent.....	100.0	100.0	100.0	100.0
County classification:				
Under 10 percent rural-farm.....	54.5	54.1	55.7	53.7
10 to 19 percent rural-farm.....	20.2	20.6	21.0	21.8
20 to 29 percent rural-farm.....	9.2	9.3	8.8	9.1
30 to 39 percent rural-farm.....	11.5	11.5	10.6	11.2
40 to 49 percent rural-farm.....	3.4	3.3	2.9	3.1
50 to 59 percent rural-farm.....	1.1	1.1	.9	1.0
60 to 69 percent rural-farm.....	.1	.1	.1	.1

¹ Base figures for 1930, 1940, and 1943 from Bureau of the Census; 1948 figures estimated by Sales Management.

² Less than 0.05 percent.

Source: Flagg, Grace L. and Longmore, T. Wilson: Trends in Rural and Urban Levels of Living (Agricultural Information Bulletin No. 11). Washington, Department of Agriculture, Bureau of Agricultural Economics, 1949, pp. 7-8.

Civilian Labor Force

Table 10.—Number of employed persons 14 years of age and over in the civilian labor force, by age, sex, and type of employment, United States, 1949

Age group (in years)	Annual average (in thousands) ¹		
	Both sexes	Male	Female
IN ALL CIVILIAN EMPLOYMENT			
All ages (14 and over).....	58,710	41,660	17,049
14 and 15.....	773	549	225
16 and 17.....	1,476	916	560
18 and 19.....	2,263	1,222	1,041
20 to 24.....	6,703	4,222	2,481
25 to 34.....	13,703	9,918	3,785
35 to 44.....	13,164	9,343	3,821
45 to 54.....	10,681	7,691	2,990
55 to 64.....	7,078	5,465	1,612
65 and over.....	2,871	2,335	536
IN NONAGRICULTURAL INDUSTRIES			
All ages (14 and over).....	50,684	35,023	15,661
14 and 15.....	414	262	152
16 and 17.....	1,058	599	459
18 and 19.....	1,915	927	988
20 to 24.....	5,994	3,626	2,368
25 to 34.....	12,347	8,803	3,543
35 to 44.....	11,661	8,161	3,500
45 to 54.....	9,333	6,631	2,702
55 to 64.....	5,872	4,418	1,454
65 and over.....	2,091	1,626	464
IN AGRICULTURAL EMPLOYMENT			
All ages (14 and over).....	8,026	6,638	1,388
14 and 15.....	359	237	72
16 and 17.....	419	348	71
18 and 19.....	348	295	52
20 to 24.....	709	596	113
25 to 34.....	1,356	1,115	241
35 to 44.....	1,503	1,182	321
45 to 54.....	1,347	1,060	288
55 to 64.....	1,206	1,047	158
65 and over.....	780	706	72

¹ Components will not necessarily add to total because of rounding.

Source: Bureau of the Census: Annual Report on the Labor Force 1949 (Series P-50, No. 19). Washington, The Bureau (Mar. 2) 1950, pp. 16-18.

Table 11.—Distribution of average noninstitutional population 14 years of age and over, by employment status and sex, United States, 1949

Employment status	Annual average (in thousands) ¹		
	Both sexes	Male	Female
Total noninstitutional population 14 years of age and over.....	109,623	53,878	55,745
Labor force.....	63,571	45,524	18,048
Armed forces.....	1,466	1,449	18
Civilian labor force:			
Employed.....	58,710	41,660	17,049
Unemployed.....	3,395	2,415	981
Persons not in labor force.....	46,051	8,354	37,697
Keeping house.....	33,068	62	33,005
Going to school.....	6,093	3,306	2,786
Other.....	6,892	4,986	1,906

¹ Components will not necessarily add to total because of rounding.

Source: Bureau of the Census: Annual Report on the Labor Force 1949 (Series P-50, No. 19). Washington, The Bureau (Mar. 2) 1950, p. 13.

Table 12.—Estimated total monthly labor force, by employment status and hours worked, United States, May 1949—April 1950

Labor force	Estimated number of persons 14 years of age and over (in thousands) ¹											
	1950						1949					
	April	March	February	January	December	November	October	September	August	July	June	May
Total labor force ²	63, 513	63, 021	63, 003	62, 835	63, 475	64, 363	64, 021	64, 222	65, 105	65, 278	64, 866	63, 452
Civilian labor force.....	62, 183	61, 675	61, 637	61, 427	62, 045	62, 927	62, 576	62, 763	63, 637	63, 815	63, 398	61, 983
Unemployment.....	3, 515	4, 123	4, 684	4, 490	3, 489	3, 409	3, 576	3, 351	3, 689	4, 095	3, 778	3, 289
Unemployed 4 weeks or less.....	1, 130	1, 229	1, 583	1, 956	1, 399	1, 586	1, 736	1, 327	1, 484	1, 805	1, 925	1, 601
Unemployed 5 to 10 weeks.....	686	1, 143	1, 456	1, 171	971	1, 771	719	757	1, 020	1, 104	808	763
Unemployed 11 to 14 weeks.....	521	580	547	418	302	257	300	385	299	361	299	316
Unemployed 15 to 25 weeks.....	705	722	650	542	456	460	471	473	483	439	483	490
Unemployed over 26 weeks.....	475	449	448	396	361	335	349	368	329	337	261	221
Employment.....	58, 668	57, 651	56, 963	56, 947	58, 556	59, 518	59, 001	59, 411	59, 947	59, 720	59, 619	58, 094
Nonagricultural.....	51, 473	50, 877	50, 730	50, 749	51, 783	51, 640	51, 290	51, 254	51, 441	50, 073	49, 924	49, 720
Worked 35 hours or more.....	41, 143	41, 834	41, 433	40, 839	42, 260	42, 766	41, 354	41, 354	40, 407	37, 696	40, 924	41, 315
Worked 15 to 34 hours ³	6, 522	5, 715	6, 271	6, 251	6, 126	11, 363	6, 056	5, 231	5, 231	14, 701	5, 425	5, 073
Worked 1 to 14 hours ⁴	2, 183	2, 102	2, 085	1, 974	2, 049	1, 991	2, 027	1, 867	1, 609	1, 438	1, 625	1, 778
With a job but not at work ⁵	1, 597	1, 725	1, 941	1, 696	1, 349	1, 501	1, 855	2, 339	4, 284	6, 247	2, 051	1, 694
Agricultural.....	7, 195	6, 875	6, 223	6, 188	6, 773	7, 878	7, 710	8, 158	8, 507	9, 647	9, 696	8, 974
Worked 35 hours or more.....	5, 125	4, 551	4, 334	3, 979	4, 778	6, 205	5, 462	6, 294	6, 724	7, 226	7, 400	7, 199
Worked 15 to 34 hours.....	1, 503	1, 575	1, 371	1, 459	1, 511	1, 256	1, 604	1, 455	1, 280	1, 571	1, 952	1, 474
Worked 1 to 14 hours ⁴	318	318	300	329	297	258	365	269	284	228	228	211
With a job but not at work ⁵	250	295	317	431	189	179	279	140	228	189	116	130

¹ Based on Bureau of the Census data. Estimates are subject to sampling variation which may be large in cases where the quantities shown are relatively small. Therefore, the smaller estimates should be used with caution. All data exclude persons in institutions. Because of rounding, the individual figures do not necessarily add to group totals.

² Census survey week contains legal holiday.

³ Total labor force consists of the civilian labor force and the Armed Forces.

⁴ Excludes persons engaged only in incidental unpaid family work (less than 15 hours); these persons are classified as not in the labor force.

⁵ Excludes persons who had a job or business, but who did not work during the census week because of illness, bad weather, vacation, labor dispute, or because of temporary lay-off with definite instructions to return to work within 30 days of layoff. Does not include unpaid family workers.

Source: Department of Labor, Bureau of Labor Statistics. "Current Labor Statistics." Monthly Labor Review, 70: 673 (June) 1950.

Table 13.—Number of persons in the civilian population 14 years of age and over, and number and percent in civilian labor force, by age, sex, and marital status, United States, April 1949

Age group (in years)	Civilian population (in thousands) ¹					
	Total male	In labor force		Total female	In labor force	
		Number	Percent		Number	Percent
	Total					
All ages (14 and over) ²	53, 448	44, 061	82. 4	56, 001	17, 167	30. 7
14 to 19.....	6, 110	2, 811	46. 0	6, 385	1, 767	27. 7
14 to 17.....	4, 211	1, 476	35. 1	4, 168	684	16. 4
18 and 19.....	1, 890	1, 333	70. 2	2, 217	1, 083	48. 8
20 to 24.....	5, 591	4, 713	84. 3	5, 952	2, 484	41. 7
25 to 34.....	11, 196	10, 604	94. 7	11, 982	3, 880	32. 4
35 to 44.....	10, 103	9, 783	96. 8	10, 498	3, 898	37. 1
45 to 64.....	15, 127	13, 723	90. 7	15, 307	4, 632	30. 3
65 and over.....	5, 321	2, 425	45. 6	5, 879	509	8. 7
Median age.....	38. 8	39. 0	-----	38. 5	36. 2	-----
	Single					
All ages (14 and over) ²	13, 952	8, 957	64. 2	11, 174	5, 682	50. 9
14 to 19.....	5, 996	2, 716	45. 3	5, 430	1, 565	28. 8
14 to 17.....	4, 192	1, 471	35. 1	3, 925	646	16. 5
18 and 19.....	1, 804	1, 245	69. 0	1, 505	919	61. 1
20 to 24.....	3, 113	2, 401	77. 1	1, 836	1, 392	75. 8
25 to 34.....	2, 147	1, 859	86. 6	1, 437	1, 186	81. 0
35 to 44.....	1, 003	854	85. 1	823	662	80. 4
45 to 64.....	1, 251	940	75. 1	1, 175	785	66. 8
65 and over.....	442	186	42. 1	474	115	24. 8
Median age.....	21. 6	23. 7	-----	20. 4	24. 6	-----
	Married, spouse present					
All ages (14 and over) ²	35, 323	32, 559	92. 2	35, 323	7, 959	22. 5
14 to 19.....	83	81	-----	840	156	18. 6
14 to 17.....	7	7	-----	190	26	13. 7
18 and 19.....	77	74	-----	649	130	20. 0
20 to 24.....	2, 315	2, 198	94. 9	3, 759	921	24. 5
25 to 34.....	8, 568	8, 370	97. 7	9, 658	2, 190	22. 7
35 to 44.....	8, 521	8, 512	98. 7	8, 471	2, 412	28. 5
45 to 64.....	12, 347	11, 638	94. 3	10, 550	2, 174	20. 6
65 and over.....	3, 388	1, 759	51. 9	2, 045	106	5. 2
Median age.....	42. 8	41. 6	-----	39. 0	38. 0	-----
	Other marital status					
All ages (14 and over) ²	4, 174	2, 544	60. 9	9, 505	3, 526	37. 1
14 to 19.....	31	14	-----	116	46	39. 7
14 to 17.....	12	-----	-----	53	12	-----
18 and 19.....	19	14	-----	63	34	-----
20 to 24.....	163	114	-----	357	170	47. 6
25 to 34.....	481	375	78. 0	887	525	59. 2
35 to 44.....	479	417	87. 1	1, 204	824	68. 4
45 to 64.....	1, 528	1, 145	74. 9	3, 582	1, 673	46. 7
65 and over.....	1, 491	480	32. 2	3, 359	288	8. 6
Median age.....	57. 2	51. 1	-----	57. 2	47. 4	-----

¹ Civilian population includes members of the Armed Forces living off post or on post with their families, but excludes all other members of the Armed Forces. The small number of armed-force members included in the civilian population are also included in the "civilian labor force."

² Components will not necessarily add to total because of rounding.

Sources: Bureau of the Census: Current Population Reports, Labor Force (Series P-50, No. 22), Washington, The Bureau (Apr. 19) 1950, p. 10.

Table 14.—Percentage distribution of estimated number of workers, classified by full-time or part-time status, by class of worker and type of industry, United States, Feb. 5-11, 1950¹

Class of worker and type of industry	Total persons at work	Worked full time during survey week	Worked part time during survey week						
			Usually worked full time			Usually worked part time			
			Total	Worked part time because of economic factors	Worked part time for other reasons	Total	Prefer and could accept full-time work	Do not prefer or could not accept full-time work	
									Total
All categories.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Private wage or salary workers.....	69.5	69.9	67.4	69.6	84.5	62.2	66.0	84.6	62.0
In agriculture.....	2.0	1.8	3.3	4.7	2.9	5.6	2.5	6.4	1.7
In nonagricultural industries.....	67.4	68.1	64.0	64.9	81.6	56.7	63.5	78.2	60.3
Government workers.....	10.4	11.3	5.6	4.3	1.3	5.7	6.4	2.7	7.2
Self-employed workers.....	18.0	17.6	19.9	24.5	14.0	29.7	17.2	10.8	18.6
In agriculture.....	7.2	6.8	9.3	16.3	5.9	21.4	5.1	.6	6.1
In nonagricultural industries.....	10.7	10.8	10.6	8.2	8.0	8.3	12.1	10.2	12.5
Unpaid family workers.....	2.2	1.2	7.2	1.7	.4	2.3	10.4	2.0	12.2
In agriculture.....	1.5	.9	5.0	1.5	.4	2.1	7.1	1.2	8.3
In nonagricultural industries.....	.7	.4	2.2	.2	-----	.3	3.3	.8	3.9

¹ Based on the Census Bureau's monthly population sample survey, covering 25,000 households located in 68 areas in 42 States and the District of Columbia.

Source: Bureau of the Census: Current Population Reports Labor Force (Series P-50, No. 26). Washington, The Bureau (July 10) 1950, p. 7.

Table 15.—Distribution of persons engaged in production, by major industrial division and employment status, United States, 1949

Industrial division	Persons engaged in production					
	Number (in thousands)			Percentage distribution		
	Total	Full-time equivalent employees	Active proprietors	Total	Full-time equivalent employees	Active proprietors
All industries, total.....	57, 588	46, 767	10, 821	100.0	100.0	100.0
Agriculture, forestry, and fisheries.....	7, 270	2, 389	4, 881	12.6	5.1	45.1
Mining.....	963	917	46	1.7	2.0	.4
Contract construction.....	3, 269	2, 148	1, 121	5.7	4.6	10.4
Manufacturing.....	14, 351	14, 187	164	24.9	30.3	1.5
Wholesale and retail trade.....	11, 185	8, 836	2, 349	19.4	18.9	21.7
Finance, insurance, and real estate.....	1, 999	1, 640	359	3.5	3.5	3.3
Transportation.....	2, 850	2, 615	235	4.9	5.6	2.2
Communications and public utilities.....	1, 289	1, 281	8	2.2	2.6	.1
Services.....	7, 344	5, 686	1, 658	12.8	12.2	15.3
Government and Government enterprises.....	7, 062	7, 062	-----	12.3	15.1	-----
Rest of the world.....	6	6	-----	-----	-----	-----

Source: Department of Commerce: "Basic Data on the National Economy." Survey of Current Business, 30: 21-23 (July) 1950.

Table 16.—Distribution by major occupation group of employed persons 14 years of age and over, classified according to sex and marital status, United States, April 1949 ¹

Major occupation group	Male				Female			
	Total	Single	Married with spouse present	Other marital status	Total	Single	Married with spouse present	Other marital status
Number (in thousands)								
All employed persons ²	41,463	8,048	31,101	2,314	16,356	5,395	7,637	3,324
Professional and semiprofessional workers.....	2,564	445	2,018	101	1,477	637	635	205
Farmers and farm managers.....	4,565	541	3,826	198	230	27	116	98
Proprietors, managers, and officials, except farm.....	5,398	384	4,769	244	867	129	525	213
Clerical, sales and kindred workers.....	5,172	1,323	3,654	195	5,928	2,672	2,474	782
Craftsmen, foremen and kindred workers.....	7,524	833	6,286	405	165	61	81	23
Operatives and kindred workers.....	8,432	1,751	6,241	440	3,199	811	1,682	706
Service workers.....	2,574	610	1,651	313	3,577	895	1,427	1,255
Farm laborers and foremen.....	1,994	1,238	614	142	821	130	660	31
Laborers, except farm and mine.....	3,242	923	2,043	276	85	32	37	16
Percent								
All employed persons.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Professional and semiprofessional workers.....	6.2	5.5	6.5	4.4	9.0	11.8	8.3	6.2
Farmers and farm managers.....	11.0	6.7	12.3	8.6	1.4	.5	1.5	2.8
Proprietors, managers, and officials, except farm.....	13.0	4.8	15.3	10.5	5.3	2.4	6.9	6.4
Clerical, sales and kindred workers.....	12.5	16.4	11.7	8.4	36.2	49.5	32.4	23.5
Craftsmen, foremen and kindred workers.....	18.1	10.4	20.2	17.5	1.0	1.1	1.1	.7
Operatives and kindred workers.....	20.3	21.8	20.1	19.0	19.6	15.0	22.0	21.2
Service workers.....	6.2	7.6	5.3	13.5	21.9	16.6	18.7	37.8
Farm laborers and foremen.....	4.8	15.4	2.0	6.1	5.0	2.4	8.6	.9
Laborers, except farm and mine.....	7.8	11.5	6.6	11.9	.5	.6	.5	.5

¹ Excludes members of the armed forces living off post or on post with their families. Figures for this portion of the population are included in other tables in the same report.

² Components will not necessarily add to total because of rounding.

Source: Bureau of the Census: Current Population Reports, Labor Force. (Series P-50, No. 22). Washington, The Bureau (Apr. 19) 1950, p. 11.

Table 17.—Number of full-time equivalent employees and average number of full-time and part-time employees, by major industrial division, United States, for specified years, 1942-49

Industrial division	Full-time equivalent employees (in thousands)				Full-time and part-time employees (in thousands)			
	1942	1944	1947	1949	1942	1944	1947	1949
All industries, total.....	47,630	55,154	46,977	46,767	49,926	57,064	49,265	49,122
Agriculture, forestry, and fisheries.....	2,666	2,367	2,366	2,389	2,698	2,399	2,401	2,424
Mining.....	985	879	938	917	985	879	938	917
Contract construction.....	2,131	1,110	2,060	2,148	2,131	1,110	2,060	2,148
Manufacturing.....	15,284	17,050	15,215	14,187	15,284	17,050	15,215	14,187
Wholesale and retail trade.....	6,763	6,625	8,574	8,836	7,617	7,366	9,524	9,813
Finance, insurance, and real estate.....	1,364	1,300	1,553	1,640	1,456	1,383	1,657	1,748
Transportation.....	2,413	2,810	2,874	2,615	2,516	2,925	3,000	2,742
Communications and public utilities.....	944	887	1,177	1,281	946	890	1,181	1,286
Services.....	5,340	5,033	5,503	5,686	5,913	5,570	6,104	6,301
Government and Government enterprises.....	9,735	17,088	6,712	7,062	10,475	17,487	7,180	7,550
Rest of the world.....	5	5	5	6	5	5	5	6

Source: Department of Commerce: "Basic Data on the National Economy," Survey of Current Business, 80: 21 (July) 1950.

Factors Affecting the Employment of Women and Children

Child Labor

In our system of labor law, regulation of child labor is among the measures to protect physical health and safety of workers and the common welfare: It is based essentially on the idea of protecting the weak. The virtual abolition of the paid labor of children that has accompanied the development of legislation over more than a century is perhaps the most impressive evidence of economic and social progress in the United States. . . . In the regulation or abolition of child labor, laws requiring school attendance have complemented legislation directly concerned with child labor. . . .

To some extent, the development of modern industrial technology has contributed to the elimination of children from the labor force. Modern machine tools are too complicated for a child to wield.

Regulation of child labor, like other institutions of the labor market, is thus a social device whereby certain specific objectives have been and are being accomplished and also a bench mark of economic developments that has made this device possible and facilitated its use.

Regulation of child labor lies essentially within the jurisdiction of the States and is supplemented by Federal laws relating either to definite industries (Public Contracts Act and Sugar Act) or to the whole field of interstate commerce (Fair Labor Standards Act).

Women Employees

Like the child labor laws, regulation of the employment of women was undertaken for the welfare of the race. The immediate aim has been to protect the health of working women, who often combine the function of wage earner with that of mother. Unlike the child labor laws, which aim at curtailment and abolition of child labor, the laws for women workers have not been directed against employment of women as such; the purpose was rather to improve conditions of women without prejudice to their opportunity to work.

Regulation of the employment of women is effectuated by an almost chaotic agglomeration of State laws enacted at different dates and in different circumstances, repeatedly changed and amended and in many cases only loosely adjusted to one another. . . . Since most women are engaged in intrastate fields of employment . . . State laws are still of primary importance in regulation of this sector of the labor market.

The main objectives of State laws protecting women workers are limitation of hours of work, requirement of a day of rest, prohibition of night work and regulation of homework. Each of these types of regulation has a long history, but progress was slow before the turn of

the century and some of the most important regulations have become effective only in the past two decades.

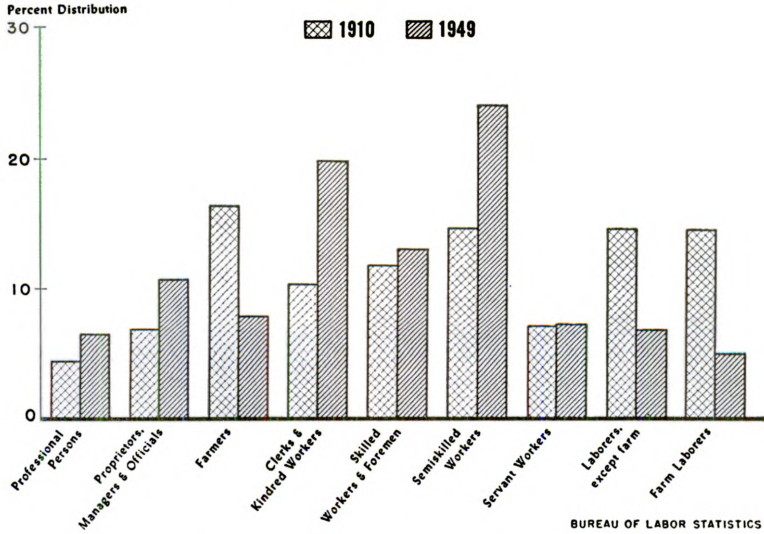
Quoted from Grunfel, Judith: In a volume dealing with employment and wages prepared for the Twentieth Century Fund, by W. S. Woytinsky and Associates, to be published in 1951.

Table 18.—Major standards recommended for State child-labor legislation and the extent to which existing State child-labor laws meet these standards

Recommended standards	Extent to which State child-labor laws meet recommended standards
<p>Minimum age: <i>16 years</i>, in any employment in a factory; 16 in any employment during school hours; 14 in nonfactory employment outside school hours.</p>	<p>23 States, Alaska, and Puerto Rico approximate this standard in whole or in part (Alabama, Connecticut, Florida, Georgia, Illinois, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Montana, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Virginia, West Virginia, Wisconsin).</p>
<p>Hazardous occupations: <i>Minimum age 18</i> for employment in a considerable number of hazardous occupations.</p>	<p>Few, if any, States extend full protection in this respect to minors up to 18 years of age, though many State laws prohibit employment under 18 in a varying number of specified hazardous occupations.</p>
<p>State administrative agency authorized to determine occupations hazardous for minors <i>under 18</i>.</p>	<p>21 States, District of Columbia, Alaska, Hawaii, and Puerto Rico, have a State administrative agency with such authority (Arizona, Colorado, Connecticut, Florida, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Utah, Washington, West Virginia, Wisconsin).</p>
<p>Maximum daily hours: 8-hour day for minors <i>under 18</i> in any gainful occupation.</p>	<p>15 States, Alaska, District of Columbia, and Puerto Rico have an 8-hour day for minors of <i>both sexes</i> under 18 in most occupations (California, Kentucky, Louisiana, Montana, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Utah, Virginia, Washington, Wisconsin).</p>
<p>Maximum weekly hours: 40-hour week for minors <i>under 18</i> in any gainful occupation.</p>	<p>7 other States have this standard for <i>girls</i> up to 18 (Arizona, Colorado, Illinois, Indiana, Nevada, New Mexico, Wyoming).</p>
<p>Maximum weekly hours: 40-hour week for minors <i>under 18</i> in any gainful occupation.</p>	<p>5 States (Kentucky, New Jersey, Tennessee, Virginia, Wisconsin). Alaska and Puerto Rico have a 40-hour week for minors <i>under 18</i> in most occupations; 4 States (Louisiana, Oregon, Pennsylvania, Utah) a 44-hour week for such minors.</p>
<p>7 other States (Alabama, Florida, Georgia, Maryland, North Carolina, Rhode Island, West Virginia) and Hawaii have a 40-hour week for minors <i>under 16</i> in most occupations, and 3 States (Mississippi, New Mexico, New York) a 44-hour week for such minors.</p>	<p>10 States, Hawaii, and Puerto Rico meet or exceed this standard, at least for most occupations (Iowa, Kansas, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Utah, Virginia).</p>
<p>Work during specified night hours prohibited: 13 hours of night work prohibited for minors of both sexes <i>under 16</i> in any gainful occupation.</p>	<p>13 States and District of Columbia prohibit 12 or 12½ hours of night work for minors <i>under 16</i> (Alabama, Arizona, Illinois, Maryland, Massachusetts—12½ hours; Minnesota, Missouri, New Mexico, North Dakota, Pennsylvania, Rhode Island, Tennessee, Wyoming. The Alabama law prohibits such work for 12 night hours during the regular school term, and "after 7 p. m." at other times).</p>
<p>8 hours of night work prohibited for minors of both sexes <i>between 16 and 18</i> in any gainful occupation.</p>	<p>13 States, District of Columbia, and Puerto Rico meet or exceed this standard at least for most occupations (Arkansas, California, Connecticut, Florida, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, New Jersey, Ohio, Tennessee, Washington).</p>
<p>Employment certificates: Required for minors <i>under 18</i> in any gainful occupation.</p>	<p>22 States, District of Columbia, Hawaii, and Puerto Rico require employment or age certificates for minors <i>under 18</i> in most occupations (California, Connecticut, Florida, Georgia, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Montana, Nevada, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Utah, Virginia, Wisconsin, and, where continuation schools are established, Oklahoma.) 1 other State (Alabama) requires such certificates for minors <i>under 17</i>.</p>

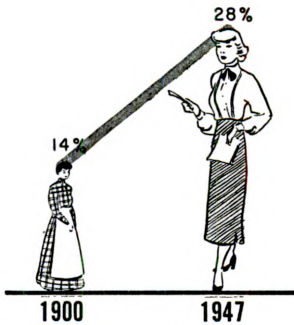
Source: Department of Labor, Bureau of Labor Standards: Major Standards Recommended for State Child-Labor Legislation and the Extent to Which Existing State Child-Labor Laws Meet These Standards. Washington, The Bureau (July 1) 1950. (Mimeographed.)

Socio-Economic Groups in the Labor Force



Women in the Labor Force

Percent Of Total Labor Force

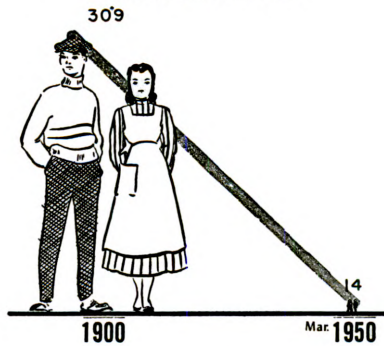


UNITED STATES DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

Children in the Labor Force

14 AND 15 YEARS OLD

Number Per 1000 In Population



Source: U.S. BUREAU OF THE CENSUS

Source Ober, Harry: "The Worker and His Job." Monthly Labor Review, 71: 17 (July) 1950.

FIGURE 3.

Table 19.—Changes in number of women workers in each age group, United States, 1940, 1947¹

Age group	Number of women workers		Change, 1940, 1947	
	1940	1947	Number	Percent
All ages.....	13,840,000	16,320,000	+2,480,000	+17.9
14 to 19.....	1,460,000	1,820,000	+360,000	+24.7
20 to 24.....	2,820,000	2,690,000	-130,000	-4.6
25 to 34.....	² 3,840,000	3,640,000	-200,000	-5.2
35 to 44.....	² 2,660,000	3,580,000	+920,000	+34.6
45 to 54.....	1,830,000	2,690,000	+860,000	+47.0
55 to 64.....	920,000	1,460,000	+540,000	+58.7
65 and over.....	310,000	440,000	+130,000	+41.9

¹ Based on Bureau of the Census data.

² Estimated for adjusted figures on basis of distribution of unadjusted census figures for 1940.

Source: Department of Labor, Women's Bureau: Handbook of Facts on Women Workers (Bulletin No. 225). Washington, Government Printing Office, 1948, p. 9.

Table 20.—Employment of women production workers in chief manufacturing industries, United States, prewar and postwar¹

Industry	October 1939		October 1946		Increase October 1939 to October 1946	
	Number of women (in thousands)	Percent women were of all workers	Number of women (in thousands)	Percent women were of all workers	Number (in thousands)	Percent
All manufacturing.....	2,268	26	3,262	27	994	44
Nondurable goods.....	² 1,928	40	² 2,433	41	505	26
Apparel.....	626.0	74	819.0	77	193.0	31
Textile mill products.....	527.7	43	567.4	47	39.7	8
Food.....	263.8	28	291.3	27	27.5	10
Leather.....	139.6	40	161.5	46	21.9	16
Paper.....	69.4	24	95.1	25	25.7	37
Tobacco.....	64.9	67	55.6	63	³ 9.3	³ 14
Printing and publishing.....	59.3	18	100.0	24	40.7	69
Chemicals.....	46.0	15	110.5	21	64.5	140
Rubber.....	33.0	25	56.4	24	23.4	71
Durable goods.....	340	9	829	13	489	144
Electrical machinery.....	100.3	34	226.4	39	126.1	126
Iron and steel.....	68.8	6	141.0	9	72.2	105
Furniture.....	36.9	10	63.3	15	26.4	72
Stone, clay, glass.....	35.3	11	79.3	19	44.0	125
Nonferrous metals and products.....	34.9	14	74.6	18	39.7	114
Automobiles.....	29.5	7	68.9	9	39.4	134
Machinery (except electrical).....	28.4	5	109.7	10	81.3	286
Lumber.....	4.1	1	36.0	6	31.9	778
Transportation equipment (except auto).....	1.8	1	29.7	7	27.9	1,550

¹ Based on data from Department of Labor, Bureau of Labor Statistics, Women in Factories, October 1939–May 1947.

² Total exceeds details, as details not shown for smaller individual industries.

³ In this industry, a decline.

Source: Department of Labor, Women's Bureau: Handbook of Facts on Women Workers (Bulletin No. 225). Washington, Government Printing Office, 1948, p. 8.

Older Workers

Long-term factors affecting the demand for older workers include the decline in the proportion of skilled labor, and the smaller proportion of persons in the population employed in agriculture, and a decline in the number of self-employed. The substitution of machinery and utilization of growing numbers of unskilled and semiskilled workers in industry has lessened opportunities for utilization of the older worker, one of whose chief competitive advantages lay in the skill of craftsmanship which he had acquired over the years.

The increased concentration of industrial and commercial activity in large-scale establishments has reduced opportunity for self-employment of all workers. It has appreciably affected job opportunities for the older worker, who, though relatively inefficient, may be able to earn his own living in a family-owned small-business unit thus remaining in the labor force longer than he could as a wage earner subject to dismissal.

The proportion of workers in the civilian labor force in agriculture has declined from 21 percent in 1929 to 13 per cent in 1948. The effect of the decline in agricultural employment and in the percent of the population who are rural farm residents upon the employment opportunities of older workers is shown by a comparison of the proportion of older rural workers who consider themselves members of the labor force with urban groups of similar age. Among urban white men between 65 and 75 years of age, only 47 percent considered themselves within the labor force in 1940, whereas almost 70 percent of the rural males of this age group classified themselves as members of the labor force.

As with other groups of intermittent workers, the proportion of persons in the age groups 45 to 64 and over 65 in the labor force increased rapidly during the war. The number of men over 65 years of age in the labor force increased from 1.9 million in 1940 to 2.4 million in 1944. The number of women over 65 in the labor force increased from 310,000 in 1940 to 500,000—a total of over 600,000 persons over 65 became members of the labor force in response to wartime demand for workers.

More significantly the number of employed workers in the higher age groups increased rapidly in the period between 1940 and 1944. Rates of unemployment among workers over 45 were higher during the depression; in 1940 the unemployment rate for workers 55 to 64 years of age averaged over 14 percent. The following table [based on U. S. Bureau of the Census, Labor Force Bulletin (Series P-50)] shows the increase in the numbers of older workers employed between 1940 and 1944 as well as net changes between 1945 and 1948 in the employment of those aged 45 to 64 and those over 65 years of age.

Net change in levels of employment for workers 45 to 64 and those over 65 years of age, 1940-44 and 1945-48

[In thousands]

Year	45 to 64 years		65 and over		Total of both age and sex groups
	Male	Female	Male	Female	
1940.....	10,300	2,410	1,720	300	14,730
1944.....	13,080	4,280	2,400	490	20,250
Net change.....	+2,780	+1,870	+680	+190	+5,520
1945.....	13,090	4,360	2,430	490	20,370
1948.....	13,365	4,420	2,312	503	20,600
Net change.....	+275	+60	-118	+13	+230

During 1948 unemployment for workers over 45 varied only slightly from the average for younger workers and averaged only between 2.3 and 2.8 percent. The number of males over 65 in the labor force declined after 1945.

As the number of older persons within the population increases their status in our social and economic structure becomes more important. Is leisure to come to the older worker through retirement or be concentrated upon older workers through higher rates and longer periods of unemployment among them? Is the older worker to be retired at a specific calendar age regardless of his fitness for continued labor force participation? If so what provision for useful and constructive activity as well as for his economic security are to be made? Are pension and social security schemes adequate to prevent the older person's becoming an economic burden upon those about him, or will the eventual increase in the proportion of the population over 65 make this too great a burden upon the active members of the labor force?

The answer to these questions will partially shape the size and extent of the problem of maintaining full employment.

Quoted from U. S. Congress, Subcommittee on Unemployment: Employment and Unemployment: Report of the Subcommittee (S. Doc. No. 140). Washington, Government Printing Office, 1950, pages 63-64.

The long-time trend in the relative number of workers among older persons has been downward.

Between 1900 and 1940 the proportion of men 65 years of age and over in the labor force dropped from almost two-thirds to less than one-half. It has risen somewhat since 1940 because of full or nearly full employment in the war and postwar years, and at the present time is about 45 percent.

Unemployment tends to be less severe a problem among older workers than in the labor force as a whole, in part because older workers who find it difficult to obtain work tend to drop out of the labor force.

In the second quarter of 1950, for instance, unemployed men workers 65 years and over comprised 4.5 percent of the men in that

age group in the labor force, as compared with a ratio of about 5 percent in the male labor force as a whole.

Quoted from Federal Security Agency: *Some Facts About Our Aging Population*. Washington, The Agency, 1950, page 10. (Prepared for the National Conference on Aging, August 13-15, 1950.)

Throughout the Western World a new phenomenon in human experience has appeared—the rapidly growing numbers of older people with an accompanying host of economic, social, and personal problems. So far as is known no culture throughout history has ever had such a high proportion of people past middle age as has our Western civilization at midcentury. The chief reasons for this condition are the advances in medical science and the decrease in number of young immigrants. Here is the trend of those aged 65 and above in the United States, according to census data and predictions based on medium birth rate and medium mortality rate, disregarding the influence of immigration.

Year of census or prediction	Persons 65 years of age and above		Year of census or prediction	Persons 65 years of age and above	
	Number	Percent of total population		Number	Percent of total population
1900.....	3,080,000	4.1	1950 ¹	11,193,000	7.7
1910.....	3,950,000	4.3	1955 ¹	12,583,000	8.4
1920.....	4,933,000	4.7	1960 ¹	13,978,000	9.1
1930.....	6,634,000	5.4	1965 ¹	15,157,000	9.7
1940.....	8,964,000	6.8	1970 ¹	16,370,000	10.2
1945.....	10,110,000	7.2	1975 ¹	17,646,000	10.9

¹ Prediction.

Here is an 88-percent increase from 1900 to 1950 in the percentage of older people in the total population with another 42-percent growth predicted within the next quarter century. Immigration will tend to lower the proportion of older people slightly, and any reduction in mortality will raise it. . . .

In past generations *unemployment* problems among older people hardly existed. With the change from a rural to an urban civilization and the rise of large industrial establishments, most men now leave the labor force by age 65 and have years, if not decades, of free time. Whether they are supported by pensions, old-age assistance, relatives, or their own savings, only a minor fraction of men past this age contributes significantly to our economy. In times of economic stress the unemployed older ages become a major social concern. Likewise, the lightening of home duties releases many women for paying work. Many married women past the child-bearing years present special problems; they have plenty of time but often have neither work experience nor salable skill.

Conflicts between trends and needs present serious issues. On the one hand longer life gives older people years of potential economic

usefulness in a world that needs their production. On the other hand there is heavy pressure to reduce the retirement age partly to insure full employment to younger workers. Among the specific issues are these:

1. Shall the usual retirement ages be lowered and maintained with assured minimum income through pension plans and other forms of social security?
2. Shall a working population aged 20 or 25 to 55 or 60 support both the young and a growing older population or shall the potential productivity of all ages be used?
3. Shall arbitrary retirement ages be abandoned in favor of individually applied criteria for retirement?

If the working life of men and women is to be geared to the developmental needs of people instead of to the demands of the economic world, it will require education in three respects: (1) Teaching society to accept the productive and useful labor of all throughout their lives; (2) developing individual attitudes of expecting to work as long as able; and (3) retraining of older workers for work in line with their changing capabilities. . . .

Older men and women must regain their chance to be useful people once again, to earn a living, to have financial security, to live in adequate housing, to receive educational, medical, psychiatric, and social services when necessary, and to take part in the ongoing social and spiritual life of their community. Most of all they must regain the chance to live as free human beings with dignity and respect in harmony with our American democratic principles. . . .

Considerable evidence shows that a very great loss in our human resources occurs at the mature end of life. A wealth of wisdom, energy, and potentially constructive work is allowed to waste away because we have not yet become wise enough to use it to the maximum.

Quoted from Kempfer, Homer: Education for a Long and Useful Life (Federal Security Agency, Bulletin 1950 No. 6). Washington, Government Printing Office, 1950, pages 1-6.

Local employment offices of State employment security agencies, affiliated with the Labor Department's Bureau of Employment Security, are responsible for furnishing free job placement services to all job seekers regardless of age. In carrying out this responsibility, local offices come face to face with the more difficult job-finding problems of older workers. To determine the extent and nature of those problems, the Bureau has undertaken special surveys of job applicants registered at public employment offices. Such surveys were conducted in February 1949 and April 1950. Another more intensive study is now in progress in five selected areas.

The surveys have clearly shown that the extent to which workers become "older" in terms of job placement possibilities varies widely, depending upon such factors as labor market conditions, the workers'

occupational qualifications, and the nature of the employers' hiring specifications. As in World War II, prospective tightening of the labor market as a result of the Korean action appears likely to transform older job seekers from an unemployment problem into an important labor supply reserve.

Experience since World War II, however, has revealed the fact that unemployment generally hits older persons harder and longer than other workers. Recognizing the growing seriousness of this problem, especially in the light of the gradual aging of the nation's population, the current surveys sponsored by the Bureau are directed not only to the collection and analysis of useful information but also to the development and testing of specialized counseling, placement, and related techniques designed to assist older workers in making a successful job adjustment.

Quoted from Department of Labor, Bureau of Employment Security, U. S. Employment Service: *Older Workers at the Public Employment Office*. Washington, The Department, 1950, page 1. (Prepared for the National Conference on Aging, August 13-15, 1950.)

Employment Characteristics of Older Workers

The relative proportions of older workers in various industries and occupations, offer a guide as to the types of work for which they may be best suited. Differences in age distribution by industry or occupation may also be due, however, to a wide range of other factors, such as past employment trends, the proportion of women employed, and the amount of training or experience required in the given field of work.

OCCUPATION. The largest proportion of employed older workers are found among farmers, and—in lesser degree—among service workers and nonfarm proprietors and managers. Relatively low percentages of older workers are found among farm laborers (a group including many unpaid family workers), among clerical and sales workers and among the operatives. The latter group, however, accounts for the largest *number* of employed workers, 45 years and over, among the major occupational fields.

INDUSTRY. [There are] wide variations in the age distribution of workers employed, in 1947, in industries covered by OASI. The proportion of employed workers 45 years and over ranged from a high of about 50 percent in real-estate firms, and 44 percent in anthracite coal mining, to one-fifth or less in the telephone and telegraph, automobile repair, and trucking industries. Among major manufacturing industries, the highest proportions of older workers were found in iron and steel, leather and leather products, lumber, and apparel.

CLASS OF WORKER. The relative importance of self-employment rises sharply with age. While only one out of eight employed persons under age 45 was classed as self-employed in April 1950, over two-fifths of those past 65 were in this group. Many workers tend to

open their own business, or work on their own account, after they acquire the requisite experience or capital. In part, however, this pattern is also the result of curtailed opportunities for wage or salaried employment at advanced ages.

Industry Practices Affecting Hiring, Utilization, and Separation of Older Workers

AGE LIMITS IN HIRING. Comprehensive data are not available on the actual extent of specific age restrictions in hiring. A study of job orders placed by employers with public employment offices in six cities in February 1949 provides some indication of the prevalence of these restrictions. Maximum age restrictions were specified in a high proportion of jobs referred by employers to local public employment offices, ranging from about 50 percent in Dallas to about 90 percent in Birmingham.

OLDER WORKER PROTECTIVE CLAUSES IN COLLECTIVE BARGAINING AGREEMENTS. Of a total of 2,425 collective bargaining contracts analyzed in the Bureau of Labor Statistics, 247 contained some specific protective provision applying to older workers. In addition, nearly all the agreements included seniority provisions, which, by linking job security with length of service, offer a substantial measure of protection to older employees in many industries.

Absence of a specific "older worker" provision in a collective bargaining agreement does not necessarily mean that an employer has no program for transferring or retraining workers who have grown old in the company's service and who are no longer able to carry on their regular duties. It is known that such programs do exist on a formal or informal basis, but data are not available on their nature and extent. . . .

Quoted from Department of Labor, Bureau of Labor Statistics: *Fact Book on the Employment Problems of Older Workers*. Washington, The Department, 1950, pages 11, 17. (Prepared for the National Conference on Aging, August 13-15, 1950.)

The Challenge of Utilizing Our Older Workers

Traditionally, the beginning of a new century or a new half century is a time for taking stock, for assessing past achievements, and for determining what our needs will be in the future. In the field of health and welfare, the middle of the twentieth century finds few factors more significant than this: For our country this is an era of an aging population. The increasing proportion of older people today undoubtedly presents the Nation with one of its foremost problems in the conservation of human resources . . . If we go back to the year 1900, for example, we find that it was a time of youth—the median age was just under 23 years. Today, however, the median age is just over 30 and in 1975 it is expected to be 34.

Even more striking are the proportionate shifts toward the older ages. Less than one-fifth of the population was 45 years or older in

1900, but by 1960 almost one-third probably will have attained that age. Those who are generally lumped together in the old-age bracket, the group 65 years or over, constituted about 4 percent of the total in 1900. This group has now almost doubled, and 10 years from now almost 10 percent of the population is likely to be 65 years or over.

As a people, we have not given much thought to the problems of the aging because we never had to. Industry had enough young men to man the machines; those who were too old or unable to work were cared for by their families . . . If we accept the basic premise that the greatest asset of a Nation is its people, then ignoring the health and social needs of the 11,000,000 people who are 65 or over comes close to being criminally negligent. Aside from all humanitarian considerations, however, society has a very real stake in insuring that as many of this group as possible remain productive and independent. Otherwise, there will remain a group of people who are not only nonproductive but who are dependent on others for their livelihood and care. The effects on our ability to produce and on our standard of living cannot be anything but harmful.

There is another purely economic factor which must be considered in relation to the aging. Society has the right to expect a full measure of return from the investment, in terms of training and education, it puts into its citizens. This is impossible if older people are shunted out of industry, are permitted to fall victims of disability and chronic disease, and are forced out of productive employment because of hiring prejudices or arbitrary retirement ages. . . .

Our attention must be turned increasingly to the hygiene of aging. This calls for developing techniques and programs which will sustain productivity, maintain health, and meet the basic emotional and social needs of the aging group in the population . . . It is obvious, too, that physiological as well as psychological age differs markedly in various individuals with the same chronological age. How many of us "youngsters" have envied the buoyancy and vigor of a George Bernard Shaw and a Bernard Baruch? One of the lessons from this for health agencies is that health services will have to focus attention on the individual and on individual needs in dealing with the aging, while at the same time seeking to develop and apply more general measures to groups.

Rehabilitation and retraining are among the most important, albeit largely undeveloped, techniques in a program for dealing with the needs of the aging. Even when a chronic disease is not detected early, rehabilitation can mean a return to active, productive work by the sufferer . . . But retraining has even broader and more basic implications for the aging group in the population . . . Training for new and perhaps less strenuous types of work should begin well in advance of the ages when occupational changes may be desirable or necessary. Industry has a tremendous opportunity to retain the loyalty and

experience of its older workers through a process of retraining and gradual change-over to jobs that will suit individual ages and capabilities. . . .

We tend to put a premium on youth and to scrap a tremendous portion of our human resources. We accept too readily such arbitrary and unfounded ideas that older people are unfit because of their age and are subject to more work accidents and greater absenteeism. A few studies which have been made, in fact, tend to prove that the exact opposite is true—that older workers have fewer accidents and spend less time away from their jobs. And while it is true that more specific measurements of the work capacities and abilities of older people are needed, it is also true that there are few jobs for which the mature citizen cannot be trained or conditioned. . . .

The first half of the twentieth century can rightfully be termed the age of the child. Without diminishing our efforts to make the period of childhood healthier and happier we should, in the second half of the twentieth century, attempt to equal those efforts for adults. During this half century we should increasingly direct our thoughts and energies to make the period of maturity more useful and beneficial. I can think of few more lasting contributions to our Nation's ultimate health and welfare.

Quoted from Moutin, Joseph W.: "Public Health and the Aging." Public Health Reports, 65: 795-802 (June 23) 1950.

Table 21.—Distribution of employed persons 14 years of age and over in the civilian labor force, by age and work classification, United States, April 1950¹

Age group (in years)	Total	Wage or salary workers	Self-employed workers	Unpaid family workers
	Number (in thousands) ²			
All ages (14 and over).....	58,688	46,381	10,614	1,675
14 to 44.....	37,800	31,705	4,840	1,258
45 and over.....	20,872	14,679	5,776	422
45 to 64.....	17,981	13,092	4,534	358
65 and over.....	2,891	1,587	1,242	64
	Percentage distribution ²			
All ages (14 and over).....	100.0	79.0	18.1	2.9
14 to 44.....	100.0	83.9	12.8	3.3
45 and over.....	100.0	70.3	27.7	2.0
45 to 64.....	100.0	72.8	25.2	2.0
65 and over.....	100.0	54.8	43.0	2.2

¹ Based on Bureau of the Census data.

² Detail does not necessarily add to group totals due to rounding.

Source: Department of Labor, Bureau of Labor Statistics: Fact Book on the Employment Problems of Older Workers. Washington, The Department, 1950, p. 14. (Prepared for the National Conference on Aging, August 13-15, 1950.)

Table 22.—Population of the United States, at ages of dependency and productive ages, for specified years 1900–1950¹

Year	Number (in thousands)				Ratio, each year to 1900				Ratio ages 45-64 to ages 20-64
	All ages	Ages of dependency		Productive ages 20-64	All ages	Ages of dependency		Productive ages 20-64	
		Under 18	65 or over			Under 18	65 or over		
1900.....	75,995	30,709	3,080	39,032	1.00	1.00	1.00	1.00	0.266
1910.....	91,972	34,871	3,950	49,291	1.21	1.14	1.28	1.26	.272
1920.....	105,711	39,302	4,933	57,586	1.39	1.28	1.60	1.48	.296
1930.....	122,775	43,016	6,634	68,438	1.62	1.40	2.15	1.75	.313
1940.....	131,669	40,287	9,019	77,344	1.73	1.31	2.93	1.98	.337
1949.....	149,215	46,701	11,270	86,774	1.96	1.52	3.66	2.22	.353
1950 ²	151,773	47,575	11,514	87,450	2.00	1.55	3.74	2.24	.355

¹ Based on various reports by the Bureau of the Census on population, including armed forces overseas.

² Estimated by the Statistical Bureau of the Metropolitan Life Insurance Co.

Source: Metropolitan Life Insurance Co. "Trends in the Dependent Population." Statistical Bulletin 31: 2 (June) 1950.

Table 23.—Distribution of employed persons 14 years of age and over in the civilian labor force, by occupation and age, United States, April 1948¹

Occupational group	Employed persons				
	Total, aged 14 and over ²	Aged 14-44	Aged 45 years and over		
			Total	45-64	65 years and over
	Number (in thousands)				
Total employed.....	58,330	37,909	20,424	17,681	2,743
Professional and semiprofessional workers.....	4,097	2,748	1,349	1,176	173
Farmers and farm managers.....	4,662	2,119	2,543	1,926	617
Proprietors, managers, and officials except farm.....	6,381	3,428	2,953	2,574	379
Clerical, sales and kindred workers.....	10,958	8,235	2,723	2,499	224
Craftsmen, foremen, and kindred workers.....	8,111	4,907	3,204	2,899	305
Operatives and kindred workers.....	12,262	9,031	3,231	2,950	281
Service workers.....	6,013	3,313	2,700	2,239	461
Farm laborers and foremen.....	2,572	1,966	606	478	128
Laborers, except farm and mine.....	3,277	2,162	1,115	940	175
	Percentage distribution				
Total employed.....	100.0	65.0	35.0	30.3	4.7
Professional and semiprofessional workers.....	100.0	67.1	32.9	28.7	4.2
Farmers and farm managers.....	100.0	45.5	54.5	41.3	13.2
Proprietors, managers, and officials except farm.....	100.0	53.7	46.3	40.3	5.9
Clerical, sales, and kindred workers.....	100.0	75.2	24.8	22.8	2.0
Craftsmen, foremen, and kindred workers.....	100.0	60.5	39.5	35.7	3.8
Operatives and kindred workers.....	100.0	73.6	26.3	24.1	2.3
Service workers.....	100.0	55.1	44.9	37.2	7.7
Farm laborers and foremen.....	100.0	76.4	23.6	18.6	5.0
Laborers, except farm and mine.....	100.0	66.0	34.0	28.7	5.3

¹ Based on Bureau of the Census data.

² Detail does not necessarily add to group totals due to rounding.

Source: Department of Labor. Bureau of Labor Statistics: Fact Book on the Employment Problem of Older Workers. Washington, The Department, 1950, p. 12 (Prepared for the National Conference on Aging, August 13-15, 1950).

Table 24.—Percentage distribution by age group, of workers with wage credits under the Old-age and Survivors Insurance Program, classified according to last industry in which worker was employed, 1947¹

Industry	Percentage distribution of workers				
	Total, all ages ²	Under 45 years	45 years and over		
			Total	45-64 years	65 years and over
Total ³	100	73.3	26.8	23.7	3.1
Mining	100	66.7	33.3	30.2	3.1
Metal mining.....	100	67.0	33.0	29.4	3.6
Anthracite mining.....	100	55.6	44.5	40.2	4.3
Bituminous and other soft-coal mining.....	100	64.3	35.7	32.3	3.4
Crude petroleum and natural-gas production.....	100	72.7	27.1	25.4	1.7
Nonmetallic mining and quarrying.....	100	71.2	28.7	25.2	3.5
Contract construction	100	70.6	29.5	26.4	3.1
Manufacturing	100	72.2	27.7	24.6	3.1
Ordnance and accessories.....	100	71.6	28.4	25.9	2.5
Food and kindred products.....	100	74.6	25.4	22.6	2.8
Tobacco manufactures.....	100	73.8	26.2	23.1	3.1
Textile-mill products.....	100	71.8	28.1	24.9	3.2
Apparel and other finished products.....	100	70.1	30.0	26.6	3.4
Lumber and timber basic products.....	100	69.9	30.1	26.1	4.0
Furniture and finished lumber products.....	100	72.4	27.5	22.9	4.6
Paper and allied products.....	100	73.9	26.1	23.0	3.1
Printing, publishing, and allied industries.....	100	72.4	27.6	23.5	4.1
Chemicals and allied products.....	100	74.0	26.1	23.6	2.5
Products of petroleum and coal.....	100	72.8	27.3	26.4	.9
Rubber products.....	100	75.4	24.7	22.8	1.9
Leather and leather products.....	100	69.9	30.1	26.0	4.1
Stone, clay, and glass products.....	100	72.8	27.2	24.1	3.1
Iron and steel and their products.....	100	68.4	31.6	28.5	3.1
Transportation equipment (except automobiles).....	100	73.4	26.5	23.3	3.2
Nonferrous metals and their products.....	100	70.8	29.2	25.8	3.4
Electrical machinery.....	100	79.0	21.0	19.3	1.7
Machinery (except electrical).....	100	70.3	29.6	26.8	2.8
Automobiles and automobile equipment.....	100	75.4	24.6	21.8	2.8
Miscellaneous manufacturing.....	100	71.4	28.5	25.0	3.5
Transportation, communication, and public utilities	100	76.4	23.5	21.6	1.9
Local railways and bus lines.....	100	65.0	34.9	31.3	3.6
Trucking and warehousing for hire.....	100	78.6	21.4	19.2	2.2
Water transportation.....	100	73.8	26.2	23.0	3.2
Other transportation and allied services.....	100	77.3	22.7	21.0	1.7
Communications—telephone, telegraph, and related services.....	100	83.1	17.0	16.1	.9
Utilities and other public services.....	100	68.4	31.6	29.5	2.1
Wholesale and retail trade	100	76.5	23.6	20.8	2.8
Wholesale trade.....	100	73.9	26.2	23.3	2.9
Retail trade ⁴	100	77.3	22.7	20.0	2.7
Finance, insurance, and real estate	100	65.5	34.6	29.0	5.6
Banks and other finance agencies, and holding companies.....	100	70.0	30.0	25.0	5.0
Insurance.....	100	76.1	23.8	21.7	2.1
Real estate.....	100	49.1	50.9	40.9	10.0
Service industries	100	73.1	26.8	23.8	3.5
Hotels, rooming houses, camps, and other lodging places.....	100	63.6	36.3	30.7	5.6
Personal and business services.....	100	75.3	24.7	22.0	2.7
Automobile and miscellaneous repair services.....	100	79.4	20.6	18.1	2.5
Motion pictures.....	100	77.2	22.7	19.4	3.3
Amusement, recreation, and related services.....	100	76.2	23.8	20.0	3.8
Other service industries.....	100	71.1	28.8	25.0	3.8

¹ Based on tabulation of 1-percent sample.

² Percentages do not necessarily add to 100.0 percent, due to rounding.

³ Includes workers covered under OASI in agriculture, forestry, and fishing; interstate railroads; establishments not elsewhere classified; and industry not reported. Excludes workers with ages not reported.

⁴ Includes combined wholesale and retail trade establishments.

Source: Department of Labor, Bureau of Labor Statistics: Fact Book on the Employment Problems of Older Workers. Washington, The Department, 1950, p. 13. (Prepared for the National Conference on Aging, August 13-15, 1950.)

Table 25.—Percent of persons 45 years and over in the labor force: United States, selected periods, 1890-1950

Age and sex	1950 (April) †	1940 (April)	1930 (April)	1920 (January)	1920 (June)	1890 (June)
Males:						
45 years and over	78.5	77.7	82.5	83.2	84.3	86.7
45 to 54	94.6	92.7	93.8	93.5	92.8	93.9
55 to 64	85.1	84.6	86.5	86.3	86.1	89.0
65 years and over	45.0	42.2	54.0	55.6	63.2	68.2
Females:						
45 years and over	26.2	16.3	15.4	14.3	12.3	11.1
45 to 54	36.9	22.4	19.7	17.9	14.2	12.5
55 to 64	27.3	16.6	15.3	14.3	12.6	11.5
65 years and over	9.5	6.0	7.3	7.3	8.3	7.6

† 1950 data not entirely comparable with data for earlier periods.

Source: Federal Security Agency: Some Facts About Our Aging Population. Washington, The Agency, 1950, p. 10. (Prepared for the National Conference on Aging, August 13-15, 1950.)

Workers in an Emergency Period

As we approach a total manpower shortage, one question looms large: What reserves of manpower remain that can be drawn upon? . . . Broadly speaking, this total manpower reserve may be divided into four parts:

First, there are those people who are not in the labor force, the bulk being made up of women who are not now employed. It includes also students, part-time workers, retired workers who could be called back into the labor force, the handicapped, those in institutions, and workers who might be imported from foreign countries. These groups, especially women now at home, may be counted upon to extend our total labor supply.

The second reserve consists of unused or partially used manpower in the labor force. In this second category are the employed and partly employed, and the Negroes, aliens, and other religious, racial, and national minorities who have suffered from discrimination in employment. The various groups in this category are already part of the labor force, but their full skills and abilities are used poorly or not at all.

The third category consists of workers already employed at the top of their skills, but working in industries not essential to the war effort. Millions of war workers have already been drawn from this group, as plants have been converted to war work, or curtailed by lack of critical materials. Yet in the face of an urgent need for more manpower it is necessary that ways be found for transferring additional millions from less essential industry.

The fourth category might be called the "invisible labor reserve," for it consists of workers already employed on war work and in essential civilian industry. Literally millions of such workers are not, however, employed at the top of their skill. Poor management has seriously cut their productivity. They are not trained to bring out their highest potential skill. Absenteeism, labor turnover, hoarding

of skilled labor, industrial accidents, disease, waste of labor, a too-short work week, and the like are the flaws which must be repaired to unlock this reserve.

It should be remembered, however, that neither our population nor our total labor force remains constant. Our annual increase of population provides us with about 700,000 more workers per year during peacetime, 600,000 men and 100,000 women. In war years, as young people who ordinarily stay in school or college go into the army or into war industry, the annual net gain may approximate a million.

Quoted from Corson, John J. *Manpower for Victory*. New York, Farrar & Rinehart, Inc., 1943, pp. 115-117.

The manpower situation in this country has passed through very definite phases. Each was easily discernible while we were in it. Each was, and still can be, clearly defined. . . .

A. The War Manpower Commission came into existence in the midst of a manpower situation which may be described as the period of *mobilization and allocation of an adequate supply of manpower*. This period extended from April 1942 to April 1943. It contained certain fundamental characteristics.

1. The war production schedule was all green lights. Full speed ahead was the signal. Anybody who could produce anything in the way of finished products, component parts, or basic materials, was urged and helped to do so. Goals were unlimited. Incentives were high. . . .

2. The armed forces were growing in leaps and bounds. There was much confused thinking as to what the maximum goals should be. . . .

3. The manpower pool was large and appeared to some to be inexhaustible. There were millions of unemployed. There were hundreds of thousands of physically handicapped, minority groups, women, youngsters, oldsters, and other available and willing groups of potential manpower. . . .

B. In May of 1943 the manpower situation quickly shifted into a new phase which we now identify as a period of *mobilization and allocation of an inadequate supply of qualified manpower*. This period extended to the end of 1943.

1. During this time the war production program was still full speed ahead. The incentive scheduling techniques of the procurement agencies were still in operation. . . .

2. The demands of the armed forces for men had now become very specific and definite goals had been set and accepted. . . .

3. The pool of potential manpower had been fairly well consumed. Certainly those who were willing and anxious to enter the war program had been mobilized to a large degree. Serious shortages continued and increased in critical skills and in critical industries. . . .

C. The current phase . . . started in January of '44 and will extend until the course of events in Europe becomes more clear. . . .

1. Total war production has reached a peak. Red lights are now flashing on many schedules. There is even a slight decrease in totals. . . .

2. The goals of the armed services in terms of net strength either have or will have been reached within the next few months. The Army is at its peak, the Navy will be shortly. . . .

3. National statistics alone are no longer significant. . . . Unemployment is developing in some communities while serious labor shortages are increasing in others.

D. To anticipate the future is difficult. . . . We are safe in naming the next phase of manpower . . . *partial demobilization*.

Quoted from: Appley, Lawrence A.: Memorandum to Chairman on Annual Report. Washington, War Manpower Commission (Apr. 20) 1944, pp. 1-3.

Under the pressure of war's imperative, we were able to produce a much larger volume of goods and services than would have been possible at the hours of work prevailing at the time the defense program began—even if we had had relatively full employment of the normal labor force. This great expansion of output was made possible largely by (1) employing most of the unemployed workers, (2) adding several million emergency workers to the labor force, and (3) increasing hours of work. These three methods of expanding our capacity to produce would be available to us in any future emergency. In fact, the "reserve labor force" would be somewhat larger in the 1950 decade, not only because of the increased population but because the projections used in this survey assume that with longer school attendance and earlier retirement a smaller proportion of the youngest and of the oldest age classes will be in the normal labor force. . . .

At the high point of war employment in the winter of 1944-1945, the normal labor force was augmented by 12 percent through the addition of about 7 million emergency workers.

In another national emergency, mobilization of the labor force along the same lines as during the war could be expected to add at least 12.5 percent to the normal labor force in 1950 and—because of the assumed growth of the reserve labor force during the next decade—perhaps as much as 14 percent in 1960. This would mean about 7.5 million additional workers in 1950 and 8.9 million in 1960.

If these admittedly speculative—but not extravagant—assumptions are correct, it would be possible to expand employment from the assumed normal of 57 million to 66.9 million under the stress of an emergency in 1950; and in 1960, from 60.2 million to 71.7 million. Since even the peak war effort had not completely exhausted the labor supply, adequate incentives might produce enough workers to fill 67 million jobs in 1950 and 72 million in 1960. These estimates are in terms of yearly averages. At the midsummer peak in 1950, employment would rise to 70 million or more, and in 1960 to at least 75 million.

Quoted from Dewhurst, J. Frederic & Associates.: *America's Needs and Resources*. New York, The Twentieth Century Fund, 1947, pp. 569-570.

Work Establishments and Workers

Establishments and Workers by Size of Establishment

Table 26.—Distribution of reporting units with wages taxable under the Old-age and Survivors Insurance Program and of the estimated number of workers employed therein, by size of industry, March 1948

Size class (number of employees)	Reporting units ¹		Workers ²	
	Number (in thousands)	Percent	Number (in thousands)	Percent
All units.....	2,734.2	100.00	35,805	100.00
1 to 49.....	2,637.9	96.48	14,219	39.71
50 to 499.....	88.9	3.25	11,085	30.98
500 to 999.....	4.4	.16	3,012	8.41
1,000 and over.....	3.0	.11	7,489	20.91

¹ A reporting unit is an establishment or a group of establishments of the same firm engaged in the same activity and located in the same area, generally the same county. Size of reporting unit is measured by the number of persons employed in the unit during the pay period ending nearest middle of March 1948.

² Represents estimated employment during pay period ending nearest middle of March 1948 for employers who reported taxable wages under the OASI program for January-March 1948.

Source: Social Security Administration, Bureau of Old-Age and Survivors Insurance. Unpublished data. (Based on employer's reports of taxable wages, first quarter 1948.)

Table 27.—Distribution of manufacturing establishments and of workers employed therein, by size of industry, United States, 1947 ¹

Size class (number of employees)	Establishments		Workers	
	Number (in thousands)	Percent	Average number (in thousands)	Percent
All units.....	240.9	100.00	14,294	100.00
1 to 49.....	197.7	82.07	2,278	15.94
50 to 249.....	33.0	13.70	3,529	24.69
250 to 499.....	5.6	2.32	1,932	13.52
500 to 999.....	2.7	1.12	1,883	13.17
1,000 to 2,499.....	1.4	.58	2,156	15.08
2,500 and over.....	.5	.21	2,516	17.60

¹ Includes establishments in the following groups: Food and kindred products; tobacco manufactures; textile mill products; apparel and related products; lumber and products (except furniture); furniture and fixtures; paper and allied products; printing and publishing industries; chemicals and allied products; petroleum and coal products; rubber products; leather and leather products; stone, clay, and glass products; primary metal industries; fabricated metal products; machinery (except electrical); electrical machinery; transportation equipment; instruments and related products; and miscellaneous manufactures.

Source: Bureau of the Census: Census of Manufactures: 1947 (Preliminary Report—Series MC 100-6). Washington, The Bureau (Aug. 1) 1949, pp. 2-3.

Establishments by Type of Industry and Size of Establishment

Table 28.—Distribution of estimated number of reporting units with taxable wages for January–March 1948 under Old-age and Survivors Insurance Program, by industry and size of reporting unit¹

Type of industry ²	Number of reporting units of specified size						1,000 and over
	All units	1-19	20-49	50-99	100-499	500-999	
Total	2,734,152	2,488,865	149,030	50,536	38,351	4,391	2,979
Agriculture, forestry, and fishing	13,488	12,940	434	79	35	0	0
Farms (01).....	3,822	3,676	113	23	10	0	0
Agricultural and similar services.....	7,228	6,956	211	39	22	0	0
Forestry (08).....	189	174	11	4	0	0	0
Fishing (09).....	2,249	2,134	99	13	3	0	0
Mining	28,602	22,291	3,240	1,373	1,365	234	99
Metal mining (10).....	1,735	1,842	154	75	125	23	16
Anthracite mining (11).....	803	532	99	52	75	29	16
Bituminous and other soft coal (12).....	8,785	6,146	1,184	529	735	140	51
Crude petroleum and natural gas (13).....	13,068	11,066	1,175	484	318	30	15
Nonmetallic mining and quarrying (14).....	4,191	3,205	628	233	112	12	1
Contract construction	216,186	198,016	12,229	3,666	2,089	142	44
Building—general contractors (15).....	57,922	51,432	4,166	1,356	882	64	22
General contractors, not building (16).....	16,929	13,351	1,954	898	643	64	19
Special-trade contractors (17).....	141,335	133,233	6,109	1,412	564	14	3
Manufacturing	271,107	185,718	40,922	19,558	20,076	2,788	2,047
Ordnance and accessories (19).....	113	66	22	9	4	3	9
Food and kindred products (20).....	37,414	26,258	5,825	2,643	2,345	221	119
Tobacco manufactures (21).....	1,067	741	91	61	131	23	20
Textile mill products (22).....	9,185	3,750	1,641	1,153	1,974	415	255
Apparel, fabric products, etc. (23).....	32,731	19,060	7,694	3,410	2,410	133	24
Lumber and wood products (24).....	42,392	34,367	4,723	1,908	1,302	80	12
Furniture and fixtures (25).....	9,947	7,010	1,473	686	663	57	28
Paper and allied products (26).....	4,150	1,563	826	604	859	137	61
Printing, publishing, etc. (27).....	30,924	25,291	3,238	1,229	981	109	76
Chemicals and allied products (28).....	11,063	7,154	1,741	970	956	126	106
Products of petroleum and coal (29).....	1,415	661	246	176	234	41	57
Rubber products (30).....	1,030	625	137	88	168	56	56
Leather and leather products (31).....	5,695	3,074	999	612	868	114	28
Stone, clay, and glass products (32).....	11,379	8,218	1,465	709	826	99	62
Primary metal industries (33):							
Blast furnaces, steel works, etc. (331).....	355	43	24	31	94	42	121
Iron and steel foundries (332).....	1,968	572	449	370	467	72	38
Nonferrous metals—smelting, refining, rolling foundries, etc. (333-336).....	2,518	1,531	433	194	241	58	61
Other primary metals (330, 339).....	1,120	542	202	120	196	37	23
Fabricated metals products, except ordnance, machinery, and transportation equipment (34).....	17,166	11,225	2,666	1,362	1,533	258	122
Machinery, except electrical (35).....	19,457	13,112	2,760	1,345	1,651	311	278
Electrical machinery, equipment, supplies (36).....	4,560	2,460	715	408	662	154	161
Transportation equipment (37):							
Motor vehicles and equipment (371).....	2,107	1,114	355	168	241	75	154
Aircraft and parts (372).....	396	208	60	43	43	14	28
Ship and boat building, repairing (373).....	1,494	1,052	176	93	121	17	35
Railroad equipment (374).....	317	163	69	19	34	8	24
Other transportation equipment (370, 376).....	447	308	67	42	19	6	5
Instruments, professional, scientific, and controlling; photographic and optical goods; watches and clocks (38).....	3,412	2,340	476	227	277	41	51
Miscellaneous manufacturing industries (39).....	17,282	13,308	2,249	868	743	81	33
Public utilities	102,791	87,175	8,643	3,423	2,852	377	321
Interstate railroads (40).....	20	18	1	0	1	0	0
Local and interurban railways and bus lines (41).....	1,974	1,296	287	158	179	25	29
Trucking and warehousing (42).....	59,692	53,653	3,972	1,357	687	21	2
Other transportation, except water (43).....	16,188	13,823	1,376	518	389	50	32
Water transportation (44).....	2,022	1,311	283	141	213	36	38
Services allied to transportation (45).....	7,378	6,347	508	213	240	50	20
Telecommunications (46).....	8,868	6,504	1,110	481	552	103	118
Utilities—electricity and gas (48).....	4,504	2,283	977	510	563	90	81
Local utilities and sanitary services (49).....	2,145	1,940	129	45	28	2	1

See footnotes at end of table.

Table 28.—Distribution of estimated number of reporting units with taxable wages for January–March 1948 under Old-age and Survivors Insurance Program, by industry and size of reporting unit—Continued

Type of industry ¹	Number of reporting units of specified size						
	All units	1-19	20-49	50-99	100-499	500-999	1,000 and over
Wholesale trade.....	248,066	218,422	20,608	5,937	2,883	161	55
Merchant wholesalers (50).....	131,175	114,433	11,961	3,287	1,440	49	5
Other than merchant wholesalers (51).....	88,641	79,448	5,844	1,948	1,250	103	48
Wholesale and retail trade combined, not elsewhere classified (520, 521, 529).....	28,250	24,541	2,803	702	193	9	2
Retail trade.....	944,009	896,411	34,345	8,325	4,253	388	13 287
General merchandise (53).....	62,214	52,012	6,024	2,322	1,490	183	173
Food and liquor stores (54).....	212,254	205,990	4,134	1,095	851	107	77
Automotive dealers (55).....	58,839	51,335	6,072	1,159	265	7	1
Apparel and accessories (56).....	71,943	66,950	3,586	907	450	35	15
Retail trade, not elsewhere classified (57).....	233,280	224,391	6,886	1,266	589	35	13
Eating and drinking places (58).....	222,619	213,376	7,247	1,393	576	20	7
Retail filling stations (59).....	82,860	82,357	396	73	32	1	1
Finance, insurance, and real estate.....	226,181	213,125	8,432	2,550	1,846	147	81
Banking and trust companies (60).....	16,280	13,374	1,788	581	459	47	31
Security dealers and investment banking (61).....	4,698	4,072	381	165	78	1	1
Finance agencies, not elsewhere classified (62).....	17,137	16,255	627	164	87	3	1
Insurance carriers (63).....	15,552	11,493	2,421	754	752	85	47
Insurance agents, brokers, and service (64).....	28,181	27,317	593	163	107	1	0
Real estate (65).....	125,030	121,761	2,279	647	332	10	1
Combination office (66).....	18,375	17,990	313	57	15	0	0
Holding companies, except real estate (67).....	928	863	30	19	16	0	0
Service industries.....	631,668	603,371	19,632	5,534	2,933	153	45
Hotels, rooming houses, camps, and other lodging places (70).....	37,516	34,008	1,877	774	762	76	19
Personal services (72):.....							
Cleaning and dyeing plants (722).....	11,843	10,075	1,365	302	100	1	9
Other personal services (except 722).....	150,334	144,262	3,742	1,647	772	7	4
Business services, not elsewhere classified (73).....	53,955	49,788	2,865	792	467	34	9
Employment agencies, commercial schools, etc. (74).....	4,805	4,427	276	71	30	1	0
Automobile repair service and garage (75).....	65,164	64,067	961	115	30	1	0
Miscellaneous repair services and hand trades (76).....	35,111	34,361	616	101	29	3	1
Motion pictures (78).....	14,155	11,186	2,284	494	169	13	9
Amusement and recreation services, not elsewhere classified (79).....	35,143	32,010	2,433	526	171	3	0
Medical and other health services (80).....	111,536	110,255	904	252	121	3	1
Legal services (81).....	45,505	45,202	222	55	26	0	0
Educational services (82).....	3,626	3,360	189	57	19	1	0
Other professional and social services (83).....	13,143	12,285	607	143	101	6	1
Nonprofit membership organizations (86).....	49,480	47,736	1,296	305	136	4	1
Private households (90).....	352	349	3	0	0	0	0
Not elsewhere classified.....	8,923	8,802	86	18	16	1	0
Unclassified.....	43,131	42,596	459	73	3	0	0

¹ A reporting unit is an establishment or a group of establishments of the same firm engaged in the same activity and located in the same area, generally the same county. Size of reporting unit is measured by the number of persons employed in the unit during the pay period ending nearest the middle of March 1948. Although figures are shown to the last digit for tabulating purposes, they should not be considered accurate to the last digit. Figures in this table may differ slightly from similar data in other tables, because of computing procedures.

² Data for the manufacturing industries are classified according to the Standard Industrial Classification Manual prepared by the Bureau of the Budget in 1945. Data for the nonmanufacturing industries are classified according to the Social Security Industrial Classification Code, prepared by the Federal Security Agency, 1942.

³ Includes 74 units each employing 10,000 or more persons (1,161,488 persons employed).

⁴ Includes 57 units each employing 10,000 or more persons (908,343 persons employed).

⁵ Includes 14 units each employing 10,000 or more persons (201,892 persons employed).

⁶ Includes 5 units each employing 10,000 or more persons (80,092 persons employed).

⁷ Includes 9 units each employing 10,000 or more persons (160,390 persons employed).

⁸ Includes 15 units each employing 10,000 or more persons (265,407 persons employed).

⁹ Includes 7 units each employing 10,000 or more persons (97,100 persons employed).

¹⁰ Includes 11 units each employing 10,000 or more persons (181,420 persons employed).

¹¹ Includes 7 units each employing 10,000 or more persons (122,848 persons employed).

¹² Includes 4 units each employing 10,000 or more persons (44,940 persons employed).

Source: Social Security Administration, Bureau of Old-Age and Survivors Insurance. Unpublished data. Based on employers' reports of taxable wages, first quarter 1948.)

Table 29.—Distribution of manufacturing establishments by industry and size of establishment, United States, 1947

Type of industry	Number of establishments of specified size						
	All establishments	1-19	20-49	50-99	100-499	500-999	1,000 and over
Total	240,881	157,651	40,016	18,672	19,878	2,729	1,935
Food and kindred products.....	39,933	27,441	6,720	2,934	2,515	216	107
Tobacco manufactures.....	1,086	700	106	85	147	27	21
Textile mill products.....	8,185	3,124	1,448	1,091	1,914	399	209
Apparel and related products.....	30,960	18,500	7,219	2,979	2,122	114	26
Lumber and products (except furniture).....	26,231	19,543	3,909	1,570	1,132	63	14
Furniture and fixtures.....	7,687	4,999	1,388	667	658	63	22
Paper and allied products.....	4,103	1,248	966	687	1,051	124	37
Printing and publishing industries.....	28,986	23,415	3,258	1,138	990	103	82
Chemicals and allied products.....	10,073	6,261	1,816	928	844	110	94
Petroleum and coal products.....	1,387	875	222	156	258	42	37
Rubber products.....	875	388	182	89	147	43	56
Leather and leather products.....	5,308	2,779	994	561	845	111	18
Stone, clay, and glass products.....	11,650	8,708	1,382	624	787	88	61
Primary metal industries.....	5,363	2,210	1,007	640	1,059	219	228
Fabricated metal products.....	16,734	10,487	2,940	1,364	1,553	254	116
Machinery (except electrical).....	17,906	11,469	2,788	1,341	1,696	322	290
Electrical machinery.....	3,973	1,817	670	448	698	178	162
Transportation equipment.....	3,711	1,959	577	307	464	146	258
Instruments and related products.....	2,599	1,687	378	195	249	40	50
Miscellaneous manufactures.....	14,131	10,321	2,086	846	764	77	47

Source: Bureau of the Census. Census of Manufactures: 1947 (Preliminary Report—Series MC 100-6) Washington, The Bureau (Aug. 1) 1949, pp. 2-3.

Workers by Type of Industry and Size of Establishment

Table 30.—Distribution of estimated employment in reporting units with wages taxable under the Old-age and Survivors Insurance Program, by industry, and size of unit, March 1948¹

[In thousands]

Type of industry ¹	Employment in reporting units of specified size ²						
	All units	1-19	20-49	50-99	100-499	500-999	1,000 and over
Total	35,805	9,725	4,493	3,466	7,619	3,012	47,489
Agriculture, forestry and fishing	70	47	12	6	6	0	0
Farms (01).....	19	12	3	2	2	0	0
Agricultural and similar services (07).....	36	23	6	3	4	0	0
Forestry (08).....	1	(³)	(¹)	(⁰)	0	0	0
Fishing (09).....	14	10	3	(⁰)	(⁰)	0	0
Mining	955	123	100	95	295	162	181
Metal mining (10).....	94	6	5	5	29	14	35
Anthracite mining (11).....	76	4	3	4	19	22	25
Bituminous and other soft coal (12).....	464	41	36	37	162	97	91
Crude petroleum and natural gas (13).....	235	52	36	33	64	21	28
Nonmetallic mining and quarrying (14).....	86	20	19	16	21	8	1
Contract construction	2,030	862	367	251	381	98	72
Building—general contractors (15).....	726	266	126	94	166	45	38
General contractors, not building (16).....	388	69	61	61	123	44	30
Special-trade contractors (17).....	918	537	180	96	93	0	3
Manufacturing	15,198	1,152	1,275	1,360	4,182	1,921	65,308
Ordnance and accessories (19).....	30	(¹)	(¹)	(⁰)	2	2	25
Food and kindred products (20).....	1,384	171	180	185	459	149	240
Tobacco manufactures (21).....	103	3	3	4	32	16	44
Textile mill products (22).....	1,396	30	52	82	452	283	497
Apparel, fabric products, etc. (23).....	1,190	135	242	234	451	86	42
Lumber and wood products (24).....	801	210	144	131	244	63	19
Furniture and fixtures (25).....	356	42	46	42	138	27	44
Paper and allied products (26).....	463	13	30	42	177	93	104
Printing, publishing, etc. (27).....	721	134	99	84	193	76	135
Chemicals and allied products (28).....	708	44	55	67	200	88	248
Products of petroleum and coal (29).....	250	5	(⁰)	13	55	28	142

See footnotes at end of table.

Table 30.—Distribution of estimated employment in reporting units with wages taxable under the Old-age and Survivors Insurance Program, by industry, and size of unit, March 1948¹—Continued.

[In thousands]

Type of industry ²	Employment in reporting units of specified size ³						
	All units	1-19	20-49	50-99	100-499	500-999	1,000 and over
Manufacturing—Continued							
Rubber products (30).....	252	3	4	6	37	40	161
Leather and leather products (31).....	416	21	32	43	192	77	51
Stone, clay, and glass products (32).....	506	47	45	50	178	67	119
Primary metal industries (33):							
Blast furnaces, steel works, etc. (331).....	597	(¹)	(¹)	2	26	29	7 640
Iron and steel foundries (332).....	264	5	15	26	104	50	64
Nonferrous metals—smelting, refining, rolling foundries, etc. (333-336).....	253	10	13	13	52	41	123
Other primary metals (330, 339).....	127	4	7	8	45	26	37
Fabricated metal products, except ordnance, machinery, and transportation equipment (34).....	995	70	83	95	318	179	250
Machinery, except electrical (35).....	1,550	81	87	94	361	218	708
Electrical machinery, equipment, supplies (36).....	858	16	23	29	152	108	531
Transportation equipment (37):							
Motor vehicles and equipment (371).....	781	7	11	12	55	55	10 640
Aircraft and parts (372).....	204	1	2	3	10	11	11 177
Ship and boat building, repairing (373).....	165	5	5	6	26	12	110
Railroad equipment (374).....	87	1	2	1	9	6	67
Other transportation equipment (370, 375, 379).....	24	2	2	3	4	5	9
Instruments, professional, scientific, and controlling; photographic and optical goods; watches and clocks (38).....	264	14	14	16	61	30	128
Miscellaneous manufacturing industries (39).....	457	76	69	60	148	56	49
Public utilities.....	2,617	392	265	236	577	280	13 886
Interstate railroads (40).....	(¹)	(¹)	(¹)	0	(¹)	0	0
Local and interurban railways and bus lines (41).....	157	8	9	11	41	17	71
Trucking and warehousing (42).....	564	219	121	92	116	14	2
Other transportation, except water (43).....	322	65	41	36	78	35	67
Water transportation (44).....	185	7	9	10	48	26	84
Services allied to transportation (45).....	187	29	16	15	50	33	44
Telecommunications (46).....	687	36	35	33	116	69	13 396
Utilities—electricity and gas (48).....	491	19	31	36	121	64	220
Local utilities and sanitary services (49).....	24	9	4	3	5	2	1
Wholesale trade.....	2,800	1,069	618	402	510	104	96
Merchant wholesalers (50).....	1,449	590	358	222	240	31	7
Other than merchant wholesalers (51).....	1,035	333	177	134	239	66	86
Wholesale and retail trade combined, not elsewhere classified (520, 521, 529).....	316	146	83	46	31	6	3
Retail trade.....	6,722	3,424	1,009	562	791	266	14 671
General merchandise (53).....	1,409	219	187	159	283	124	437
Food and liquor stores (54).....	1,230	624	122	75	169	74	165
Automotive dealers (55).....	606	305	176	76	42	5	1
Apparel and accessories (56).....	584	287	104	62	84	24	22
Retail trade, not elsewhere classified (57).....	1,326	880	199	91	109	24	22
Eating and drinking places (58).....	1,327	893	208	94	98	13	21
Retail filling stations (59).....	240	214	11	5	6	(¹)	4
Finance, insurance, and real estate.....	1,741	672	252	174	354	100	189
Banking and trust companies (60).....	389	96	53	40	92	33	75
Security dealers and investment banking (61).....	58	18	12	11	14	(¹)	1
Finance agencies, not elsewhere classified (62).....	114	66	19	11	14	2	2
Insurance carriers (63).....	504	61	74	51	150	57	110
Insurance agents, brokers, and service (64).....	127	77	17	11	21	(¹)	0
Real estate (65).....	473	297	67	44	57	7	2
Combination officer (66).....	69	54	9	4	3	0	0
Holding companies, except real estate (67).....	8	3	(¹)	1	3	0	0
Service industries.....	3,527	1,859	584	375	521	102	85
Hotels, rooming houses, camps, and other lodging places (70).....	466	127	56	54	149	51	28
Personal services (72):							
Cleaning and dyeing plants (722).....	144	67	40	20	16	(¹)	0
Other personal services (except 722).....	752	393	116	106	128	4	4
Business services, not elsewhere classified (73).....	458	193	85	54	82	23	20
Employment agencies, commercial schools, etc. (74).....	40	21	8	5	6	(¹)	0
Automobile repair services and garage (75).....	242	202	27	8	5	(¹)	0

See footnotes at end of table.

Table 30.—Distribution of estimated employment in reporting units with wages taxable under the Old-age and Survivors Insurance Program, by industry, and size of unit, March 1948¹—Continued.

[In thousands]

Type of industry ²	Employment in reporting units of specified size ³						
	All units	1-19	20-49	50-99	100-499	500-999	1,000 and over
Service industries—Continued							
Miscellaneous repair services and hand trades (76).....	137	105	17	7	5	2	1
Motion pictures (78).....	251	84	67	33	33	8	26
Amusement and recreation services, not elsewhere classified (79).....	291	151	72	35	30	2	0
Medical and other health services (80).....	276	209	27	17	19	2	2
Legal services (81).....	99	85	6	4	4	0	0
Educational services (82).....	27	13	6	4	3	(⁴)	0
Other professional and social services (83).....	98	46	18	10	19	4	1
Nonprofit membership organizations (86).....	248	162	38	20	24	2	1
Private households (90).....	(⁵)	(⁵)	(⁵)	0	0	0	0
Not elsewhere classified.....	27	20	3	1	3	(⁶)	0
Unclassified.....	117	103	9	5	(⁷)	0	0

¹ Represents estimated employment during pay period ending nearest middle of March 1948 for employers who reported taxable wages under the OASI program for January-March 1948.

² Data for manufacturing industries are classified according to the Standard Industrial Classification Manual prepared by the Bureau of the Budget in 1945. Data for nonmanufacturing industries are classified according to the Social Security Industrial Classification Codes, prepared by the Federal Security Agency in 1942.

³ A reporting unit is an establishment or a group of establishments of the same firm engaged in the same activity and located in the same area, generally the same county. Size of reporting unit is measured by the number of persons employed in the unit during the pay period ending nearest middle of March 1948. Employment figures for specified unit groups do not necessarily add to total because of rounding.

⁴ Includes 1,161,488 persons in 74 units, each employing 10,000 or more persons.

⁵ Less than 1,000 persons.

⁶ Includes 908,343 persons in 57 units, each employing 10,000 or more persons.

⁷ Includes 201,892 persons in 14 units, each employing 10,000 or more persons.

⁸ Includes 80,092 persons in 5 units, each employing 10,000 or more persons.

⁹ Includes 160,390 persons in 9 units, each employing 10,000 or more persons.

¹⁰ Includes 266,407 persons in 15 units, each employing 10,000 or more persons.

¹¹ Includes 97,100 persons in 7 units, each employing 10,000 or more persons.

¹² Includes 181,420 persons in 11 units, each employing 10,000 or more persons.

¹³ Includes 122,848 persons in 7 units, each employing 10,000 or more persons.

¹⁴ Includes 44,940 persons in 4 units, each employing 10,000 or more persons.

Source: Social Security Administration, Bureau of Old-Age and Survivors Insurance. Unpublished data. (Based on employers' reports of taxable wages, first quarter 1948.)

Table 31.—Distribution of average annual employment in manufacturing establishments, by industry and size of establishment, United States, 1947

[In thousands]

Type of industry	Employment in establishments of specified size						
	All establishments	1-19	20-49	50-99	100-499	500-999	1,000 and over
Total¹.....	14,294	1,034	1,244	1,301	4,161	1,883	4,671
Food and kindred products.....	1,442	184	208	205	487	143	214
Tobacco manufactures.....	112	3	3	6	36	18	46
Textile mill products.....	1,233	25	46	78	437	273	375
Apparel and related products.....	1,082	133	225	205	396	76	46
Lumber and products (exc. furniture).....	636	139	118	108	208	43	19
Furniture and fixtures.....	322	34	43	46	129	36	33
Paper and allied products.....	450	11	31	49	225	85	49
Printing and publishing industries.....	715	127	99	78	197	71	143
Chemicals and allied products.....	632	42	57	64	174	76	220
Petroleum and coal products.....	212	5	7	11	60	28	101
Rubber products.....	259	3	5	6	34	31	180
Leather and leather products.....	383	20	31	40	194	77	22
Stone, clay and glass products.....	462	47	43	43	166	62	101
Primary metal industries.....	1,157	16	32	45	245	152	667
Fabricated metal products.....	971	69	92	97	327	172	215
Machinery (except electrical).....	1,545	76	87	94	370	226	692
Electrical machinery.....	801	13	21	32	166	133	436
Transportation equipment.....	1,182	13	18	22	103	104	923
Instruments and related products.....	232	11	12	13	54	29	113
Miscellaneous manufactures.....	464	62	66	59	152	50	75

¹ Components will not necessarily add to total because of rounding.

Source: Bureau of the Census. Census of Manufactures: 1947 (Preliminary Report—Series MC 100-6). Washington, The Bureau (Aug. 1), 1949, pp. 2-3.

Establishments and Workers by State and Region

Table 32.—Estimated employment in all reporting units with taxable wages for January–March 1948 under Old-age and Survivors Insurance Program and number of reporting units, by State and region and size of reporting unit¹

State and region	Employment ²	Number of reporting units of specified size						
		All units	1-19	20-49	50-99	100-499	500-999	1,000 and over ³
United States and Territories.....	35,805,786	2,734,162	2,488,865	149,080	50,536	38,351	4,391	2,979
New England.....	2,788,786	187,710	169,573	10,615	3,654	3,165	418	285
Connecticut.....	677,722	41,971	38,147	2,235	749	658	91	91
Maine.....	205,440	18,358	17,042	785	279	207	27	18
Massachusetts.....	1,428,620	92,891	83,251	5,625	1,997	1,672	204	142
New Hampshire.....	140,859	11,525	10,552	555	189	197	23	9
Rhode Island.....	261,310	15,380	13,639	998	322	335	64	22
Vermont.....	74,835	7,585	6,942	417	118	96	9	3
Middle East.....	10,363,206	718,069	646,581	42,441	15,183	11,668	1,269	927
Delaware.....	91,562	6,582	5,965	337	124	103	14	9
District of Columbia.....	228,901	17,626	15,759	1,186	405	244	16	18
Maryland.....	547,161	35,663	31,950	2,213	722	600	63	45
New Jersey.....	1,396,415	97,364	88,334	5,135	1,980	1,697	185	133
New York.....	4,645,984	358,145	323,016	21,810	7,396	5,042	500	381
Pennsylvania.....	3,018,504	174,755	156,288	10,221	3,968	3,563	420	296
West Virginia.....	446,669	27,934	25,239	1,539	518	519	71	48
Central.....	10,539,217	749,223	684,781	38,070	13,238	10,749	1,392	993
Illinois.....	2,664,452	186,466	169,407	9,832	3,655	2,960	372	240
Indiana.....	1,026,716	68,630	62,745	3,438	1,186	1,030	125	106
Iowa.....	439,281	51,965	48,843	1,994	670	398	35	25
Michigan.....	1,802,591	108,351	99,332	5,346	1,813	1,470	209	181
Minnesota.....	589,391	55,925	51,621	2,745	851	623	60	45
Missouri.....	924,444	74,894	68,224	3,963	1,416	1,100	122	69
Ohio.....	2,271,879	137,286	123,896	7,798	2,617	2,378	365	238
Wisconsin.....	820,463	65,697	60,713	2,964	1,080	790	101	59
Southeast.....	5,238,877	412,718	373,572	24,236	7,962	5,893	660	395
Alabama.....	497,915	34,628	31,184	2,155	660	509	67	53
Arkansas.....	211,458	23,877	22,044	1,190	380	241	17	5
Florida.....	536,677	55,708	51,027	3,057	958	698	52	16
Georgia.....	613,085	44,790	40,261	2,772	937	688	85	47
Kentucky.....	436,222	35,539	32,307	1,978	632	534	58	30
Louisiana.....	477,532	36,776	33,009	2,277	827	576	49	38
Mississippi.....	217,843	22,237	20,272	1,325	404	208	22	6
North Carolina.....	727,872	48,608	43,577	3,007	966	879	111	63
South Carolina.....	355,503	23,698	21,493	1,245	440	308	60	52
Tennessee.....	583,268	41,606	37,396	2,493	872	725	78	43
Virginia.....	581,502	45,356	41,003	2,737	886	627	61	42
Southwest.....	1,998,570	197,573	181,739	10,277	3,136	2,130	178	113
Arizona.....	122,891	13,680	12,652	700	186	126	8	8
New Mexico.....	84,993	10,426	9,693	534	130	57	10	2
Oklahoma.....	334,802	36,917	34,238	1,770	535	330	26	18
Texas.....	1,455,884	136,550	125,156	7,273	2,285	1,617	134	85
Northwest.....	1,222,567	152,437	142,714	6,509	1,987	1,092	83	52
Colorado.....	246,653	26,188	24,184	1,280	428	248	17	11
Idaho.....	81,393	10,665	9,973	482	129	73	5	3
Kansas.....	299,131	37,653	35,374	1,488	494	263	18	16
Montana.....	91,249	12,676	11,944	528	126	71	4	3
Nebraska.....	209,629	26,118	24,626	1,025	342	198	17	10
North Dakota.....	58,929	10,047	9,519	395	96	35	2	0
South Dakota.....	71,834	11,813	11,250	414	107	38	2	2
Utah.....	116,075	11,323	10,847	650	180	128	11	7
Wyoming.....	47,674	5,974	5,697	247	85	38	7	0

See footnotes at end of table.

Table 32.—Estimated employment in all reporting units with taxable wages for January–March 1948 under Old-age and Survivors Insurance Program and number of reporting units, by State and region and size of reporting unit¹—Continued

State and region	Employment ²	Number of reporting units of specified size						
		All units	1-19	20-49	50-99	100-499	500-999	1,000 and over ³
Far West.....	3,341,673	307,258	281,574	16,393	5,224	3,515	361	191
California.....	2,475,658	222,992	204,199	11,970	3,820	2,598	251	154
Nevada.....	36,226	4,156	3,843	223	43	4	4	0
Oregon.....	325,043	33,365	30,551	1,797	617	351	38	11
Washington.....	504,746	46,745	42,981	2,403	744	523	68	26
Territories.....	102,890	9,098	8,326	480	147	120	18	7
Alaska.....	14,451	1,872	1,749	83	25	14	0	1
Hawaii.....	88,439	7,226	6,577	397	122	106	18	6
Maritime ⁴		66	5	9	5	19	12	16

¹ A reporting unit is an establishment or a group of establishments of the same firm engaged in the same activity and located in the same area, generally the same county. Size of reporting unit is measured by the number of persons employed in the unit during the pay period ending nearest the middle of March 1947. Although figures are shown to the last digit for tabulating purposes, they should not be considered accurate to the last digit.

² March 1948 employment represents the total number of persons employed during the pay period ending nearest middle of March 1948. Taxable wages are wages paid by employers for covered employment during January–March 1948, including wages over \$3,000 paid by any 1 employer to any 1 employee in a calendar year. Figures in this table may differ slightly from similar data in other tables because of processing procedures. Although figures are shown to the last digit for processing purposes, they should not be considered as accurate to the last digit. Totals for U. S. and Territories have been adjusted.

³ Includes 74 units employing 10,000 or more persons. States with 5 or more such units were: Michigan, 16; New York, 10; Pennsylvania, 9; Ohio, 8; Illinois, 7; California, 6; Indiana, 5. The 74 units employed 1,161,488 persons.

⁴ Includes data for employment on vessels not classified by State.

Source: Social Security Administration, Bureau of Old-Age and Survivors Insurance. Unpublished data. (Based on employers' reports of taxable wages, first quarter 1948.)

Table 33.—Distribution of manufacturing establishments and of workers employed therein, by State and region, 1947

State and region	Number of establishments	Average number of workers	State and region	Number of establishments	Average number of workers
United States.....	240,884	14,293,855	Florida.....	2,809	78,673
New England.....	20,274	1,474,682	Georgia.....	4,752	249,832
Connecticut.....	3,947	399,586	Kentucky.....	2,244	132,504
Maine.....	1,635	100,181	Louisiana.....	2,389	132,464
Massachusetts.....	10,524	718,441	Mississippi.....	1,982	76,663
New Hampshire.....	1,124	74,752	North Carolina.....	5,322	381,480
Rhode Island.....	2,214	146,850	South Carolina.....	2,137	188,675
Vermont.....	830	34,872	Tennessee.....	3,346	221,454
Middle East.....	80,699	4,361,924	Virginia.....	3,644	216,637
Delaware.....	482	34,465	Southwest.....	9,847	374,236
District of Columbia.....	428	17,815	Arizona.....	545	14,188
Maryland.....	2,824	228,552	New Mexico.....	432	7,590
New Jersey.....	10,755	738,229	Oklahoma.....	1,741	55,406
New York.....	47,819	1,775,975	Texas.....	7,129	297,052
Pennsylvania.....	16,789	1,439,535	Northwest.....	8,092	254,331
West Virginia.....	1,602	127,353	Colorado.....	1,602	54,071
Central.....	63,827	4,965,401	Idaho.....	664	16,907
Illinois.....	15,988	1,184,403	Kansas.....	1,946	74,624
Indiana.....	5,408	548,366	Montana.....	652	16,092
Iowa.....	2,965	140,406	Nebraska.....	1,344	47,031
Michigan.....	9,892	973,675	North Dakota.....	362	5,218
Minnesota.....	4,567	179,986	South Dakota.....	494	10,265
Missouri.....	5,725	327,514	Utah.....	772	24,516
Ohio.....	12,303	1,194,603	Wyoming.....	256	5,607
Wisconsin.....	6,979	416,448	Far West.....	24,261	916,442
Southeast.....	33,884	1,946,839	California.....	17,648	663,879
Alabama.....	3,335	206,136	Nevada.....	126	2,667
Arkansas.....	1,924	65,321	Oregon.....	3,075	105,591
			Washington.....	3,412	144,305

Source: Bureau of the Census; Census of Manufacturers: 1947, vol. III. Washington, Government Printing Office, 1950, p. 30.

SECTION II

Industrial Health and Medicine in the U. S.— Historical Development and Present Scope

Historical Development

Significant Events in Chronological Order

- 1607 First industrial workplace in the Colonies, a glass bottle factory, was established in Jamestown, Va. It manufactured glass baubles and trinkets for trade with the Indians.
- 1776 Benjamin Franklin claimed that the "West India gripes" was lead colic due to drinking Jamaica rum which was distilled from stills in which the still heads and worms were made of lead. As a result, the Massachusetts Legislature prohibited the use of lead still heads and worms.
- 1780 Petersburg, Va., was the first locality to establish a board of health; New York had one of some sort in 1796, Baltimore in 1798, and the town of Boston in 1799.
- 1798 Predecessor of the United States Public Health Service, the Marine Hospital Service was established by the Federal Government for care of American seamen.
- 1836 Massachusetts passed the first child-labor law which provided that every child employed under the age of 15 receive at least 3 months schooling during the working year. This was amended in 1842 to forbid children under 12 years of age from working more than 10 hours a day in manufacturing establishments; in this same year Connecticut enacted a 10-hour law for children under 14 working in cotton and woolen mills.
- 1837 First paper to appear in the United States on the problems of industrial medicine was the prize essay *On the Influence of Trades, Professions, and Occupations in the United States in the Production of Disease*, written for the Medical Society of the State of New York by Benjamin W. McCready, later one of the founders of Bellevue Hospital Medical College and of the New York Academy of Medicine. He relied heavily on English authorities, principally Charles T. Thackrah.
- 1840 First legal action to regulate working hours in the United States was President Van Buren's Executive Order stipulating a 10-hour day in Government navy yards.
- 1847 New Hampshire passed the first law of its kind in this country setting 10 hours of work a day as the general standard for all workers in the absence of "an express contract requiring greater time." It also passed the first law limiting hours of work for women in manufacturing establishments.

- 1848 Pennsylvania was the first State to pass a law forbidding child labor. It applied only to the employment in textile establishments of children under 12 years of age, a standard which, in the following year, was raised to age 13. In 1851 New Jersey forbade the employment of children under 10 in manufacturing establishments.
- 1850 A most significant single document in the history of public health, the *Report of the Sanitary Commission of Massachusetts*, by Lemuel Shattuck, was published.
- 1852 Massachusetts passed the first safety law which applied to steam machines; in 1866 a deputy from the police department was detailed to enforce this law.
- 1855 Louisiana established first State board of health as a result of recurrent yellow-fever epidemics, but the board became quiescent and practically nonexistent. Massachusetts in 1869 established the first State board of health which remained effectively in existence from the time of its original organization.
- 1857 First municipal pension fund was established, providing disability and death benefits for New York City policemen.
- 1860 One of the earliest published papers on industrial toxicology was a study of mercurialism in the hatters' trade by J. Addison Freeman of Orange, N. J.
- 1867 Massachusetts was the first State to provide a special police officer to enforce the State law prohibiting the employment of children under 10 years of age in manufacturing establishments. First national union to institute a benefit system was the Cigar Makers' Union. Another early national benefit program was started by the Iron Molders' Union in 1870. The benefit program of the Granite Cutters' Union, established in 1877, was the first of the national union sick benefit programs. The Barbers' Union sick benefit system, established in 1895, was the oldest still paying sick benefits in 1943.
- 1868 First Federal law regarding hours of work was enacted; it stated: "Eight hours shall constitute a day's work for all laborers, workmen, and mechanics who may be employed by or on behalf of the Government of the United States." A more effective law was passed in 1892, but it did not apply to work done on a large class of goods and materials. In 1912 a law was passed requiring that an 8-hour provision be inserted in all contracts which involved employment of laborers and mechanics when made by, for, or on behalf of the Federal Government, its Territories, or the District of Columbia.
- First major industrial medical care prepayment program, the hospital department of the Southern Pacific Railroad Co., was

organized in Sacramento, Calif. It opened its hospital there in 1869. Financed jointly by the employer and employees, the program now renders complete service through a full-time staff in the Southern Pacific Hospital, in San Francisco, and through arrangements with physicians along the line. Other early railroad programs still in operation are the Missouri Pacific Hospital Association, established in 1872, and the Northern Pacific Beneficial Association, in 1882.

First major fraternal beneficiary society was the Ancient Order of United Workmen. This and other early fraternal organizations had as a primary purpose assistance to members when sick and when totally disabled.

- 1869 Massachusetts established the first State Bureau of Labor Statistics which was followed by similar State bureaus in the years 1872-84. These bureaus, in most cases, developed into State labor departments.

First account of the payroll checkoff for medical care of coal miners was given in a report of a trip to the Cumberland fields of western Maryland by James M'Killop of Scotland.

- 1874 Massachusetts was the first State to enact a law limiting the length of the working day for women without the nullifying clause exempting those under contract; the limits specified were 10 hours daily and 60 weekly. This law was further strengthened in 1879 by deleting the willful-violation requirement, thus becoming the first enforceable law regarding hours of women's employment.

- 1877 Massachusetts was the first State to pass a law requiring factory safeguards.

- 1879 A chapter entitled "Hygiene and Occupation," by Roger S. Tracy, sanitary inspector of the New York City Board of Health, appeared in *Hygiene and Public Health*, volume XIX of the *Cyclopaedia of the Practice of Medicine*. Other early general works were: "Diseases Incident to Some Occupations," by Dr. J. T. Wilson, 1879-80; *School and Industrial Hygiene*, by Dr. D. F. Lincoln, 1880; "Hygiene of the Laboring Classes," by William J. Scott, 1881; "Hygiene of Occupations," by Dr. George H. Rohé, 1884; and "The Preventable Causes of Disease, Injury, and Death in American Manufacture and Workshops and the Best Means for Preventing and Avoiding Them," by Dr. J. H. Ireland, 1886.

- 1880 Massachusetts enacted a law stipulating that printed notices containing the daily hours of work should be posted in a conspicuous place in every room where employees coming under the 10-hour law were at work. Two amendments in 1886 and

1887 provided that the notices must be put on forms approved by the attorney general and supplied by the enforcing authority, and must contain the hours of beginning and ending work and of meal times, as well as the number of hours worked each day.

Federal census included a question as to the number of persons sick and unable to work on the day of the census. This was the first known attempt to collect data on sickness from all causes in the United States by the questioning of housewives.

- 1882 First major employee-sponsored mutual benefit association was the Northern Pacific Railway Beneficial Association, which developed a program of complete medical care and other benefits financed by employer-employee payments. Medical services were provided through group practice in the Northern Pacific Hospital in St. Paul, Minn., and through arrangements with physicians along the line. In 1885 the Macy Mutual Aid Association was established, which in 1886 appointed a part-time physician to advise on sick-benefit claims and give service for minor ailments.
- 1884 Bureau of Labor was created in the Department of Interior; in 1888 it became an independent Department of Labor without executive rank. In 1903 Congress created the Department of Commerce and Labor, and in 1913 the U. S. Department of Labor.
- 1885 Alabama enacted the first Employers' Liability law, followed by Massachusetts in 1887.
- 1886 Massachusetts was the first State to place an accident-reporting law upon its statute books.
- 1887 Homestake Mining Co. of Lead, S. Dak., established a company-financed medical department with full-time staff providing complete medical service to employees and their families.
- 1888 American Association of Railroad Surgeons was founded.
- 1890 Massachusetts enacted the first State law prohibiting employment of women after 10 p. m.
- 1890 First industry with a dental program was the Barber Match Co. Another pioneer in this field was the Armstrong Cork Co. One of the oldest continuous programs is that of the Metropolitan Life Insurance Co. which was established in 1915.
- 1893 California passed the first law requiring a weekly day of rest for women workers.
- 1895 Vermont Marble Co., of Proctor, Vt., was the first company in the United States to hire a nurse, Ada Mayo Stewart, to

guard the health of an employed group, followed in 1897 by the Benefit Association of the John Wanamaker Co. of New York, in 1899 by the Brooklyn department store of Frederick Loeser, in 1900 by the Emporium in San Francisco, in 1901 by the Plymouth Cordage Co. in Massachusetts and the Anaconda Mining Co. in Montana, in 1902 by the Chase Metal Works of Connecticut and the Broadway Store in Los Angeles. In 1900 Dr. R. T. Legge introduced graduate nurses into the lumber industry in McCloud, Calif.

1898 United States Supreme Court made the first broad statement that the health of the laborer as a producer is considered to be as much a public benefit as the health of the consumer and that the protection of labor becomes a public purpose.

1902 First official industrial-hygiene survey in the United States was made for the Department of Labor by Dr. C. F. L. Doehring, a former student of Dr. George M. Kober.

Connecticut enacted a law requiring the absence of contagious disease in workers in bake shops.

Maryland passed the first State legislation providing for stated benefits to workmen injured in course of employment without suit or proof of negligence in form of a cooperative insurance law. Law was declared unconstitutional by a Baltimore court in 1904.

1903 Illinois enacted an 8-hour day for children under 16. This standard existed in 23 jurisdictions by 1915.

1904 National Child Labor Committee was formed to act as a clearing house of information on child labor, to investigate conditions, to educate public opinion, and to promote legislation. It was incorporated by an act of Congress in 1906.

1905 Massachusetts State Board of Health issued a brief report on the conditions affecting the health and safety of employees in factories and other establishments in the State. This report was supplemented in 1907 by an extensive study of dusty trades made by Dr. William C. Hanson. The 90 photographs from this study, together with charts and a collection of dust and other materials, were put on display in Boston—the first industrial hygiene exhibit in the country.

First instruction in industrial hygiene was given in the Department of Biology and Public Health of the Massachusetts Institute of Technology by Dr. C.-E. A. Winslow. In 1906 the Medical Department of the University of Pennsylvania, in connection with its courses leading to a doctorate in public health, placed considerable emphasis upon industrial hygiene, including inspection of industrial plants, service in first-aid

stations and emergency hospitals in some of the larger plants, and in the occupational disease clinic of the University Hospital.

- 1906 American Association of Labor Legislation was organized with John B. Andrews as secretary, to conduct investigations, hold national conferences, publish reports, draft bills, and secure the enactment into law of progressive standards.

First Federal law relating to compensation for injuries sustained in the course of employment in interstate commerce was enacted for railroad workers but was declared unconstitutional in 1908; a revised law was enacted and declared constitutional in 1912.

Massachusetts passed the first State law requiring a physical examination of all children applying for employment certificates.

One of the first recorded examples of giving physical examinations to a group of workers was done by Dr. Frank T. Fulton, of Providence, R. I., in a large saw works for the purpose of finding tuberculosis. For the same reason Dr. Harry Mock instituted the examination of employees of Sears, Roebuck & Co. of Chicago in 1909.

- 1907 Hours of Service Act was approved by the President, limiting service of train employees and telegraph and signal operators.

- 1908 Congress enacted a law granting to certain employees of the United States the right of compensation for injuries sustained in the course of employment; in 1916 Congress replaced this act with one covering all Federal civilian employees.

United States Supreme Court settled the question of restricting hours of work for women when it upheld the constitutionality of the Oregon 10-hour law as a health measure.

State of Illinois appointed a Commission on Occupational Disease; Dr. Alice Hamilton did the investigations of lead poisoning, Dr. Emery R. Hayhurst, copper, and Dr. Peter Bassoe, caisson sickness. The final report was published in 1911.

As Chairman of the Committee on Social and Industrial Betterment of the President's Homes Commission, Dr. George M. Kober submitted a *Report on Industrial and Personal Hygiene*. Census mortality reports contained the first useful tables, including essential facts for selected groups of occupations.

Mortality From Consumption in the Dusty Trades by Frederick L. Hoffman was published by the Bureau of Labor.

- 1909 First White House Conference on Child Welfare was held. Montana passed a law providing for a State cooperative insurance fund for workers in and around coal mines which was declared unconstitutional in 1911.

New York was the first State to pass a law specifying that applicants for work in compressed air must be found physically qualified by a physician paid by the employer; a similar law was enacted in New Jersey in 1914.

Milwaukee Visiting Nurse Association placed the first nurse in a local industrial plant to demonstrate to the employer the economic value of a public health nursing service.

Metropolitan Life Insurance Co., at the suggestion of Lillian Wald, began using Henry Street visiting nurses in an experiment in home nursing as a service to holders of industrial policies in a section of Manhattan.

- 1910 New York Employers' Liability Commission reported its findings to the legislature as a result of which two types of workmen's compensation laws were enacted, one voluntary and one compulsory. The compulsory law was the first which was broad enough in scope to be truly effective, but there was no requirement as to insurance of the compensation risk. The statute was held invalid by the New York Court of Appeals in 1911 in *Ives v. South Buffalo Railway Company*. An amendment to the constitution made possible the enactment of a compulsory law in 1914.

Department of Labor issued a report on "Phosphorus Poisoning in the Match Industry in the United States" by John B Andrews. This led to the first major public act to control occupational disease in the United States—the imposition of a prohibitive Federal tax on yellow (white) phosphorus matches.

Dr. Alice Hamilton was requested by the United States Commissioner of Labor to investigate the lead industry throughout the country. Her report (Bureau of Labor Bull. No. 95) was published in 1911. She continued making studies of industrial poisons for the Federal labor agency until 1921.

United States Bureau of Mines was created in the Department of Interior.

First national conference on industrial diseases was held under the sponsorship of the American Association for Labor Legislation.

First occupational-disease clinic in the United States was started at the Cornell Medical School Outpatient Department in New York City by Dr. W. Gilman Thompson; it was discontinued in 1916.

- 1911 Illinois passed a law requiring monthly examinations of workers in industries using or processing lead, zinc, arsenic, brass, mercury, and phosphorus but did not require the removal from danger of workmen who showed symptoms of the resultant diseases. Missouri enacted a similar law in 1913.

Washington was the first State to adopt a compulsory workmen's compensation law in the face of the Ives decision. The Washington Act created a State insurance fund which was liable for compensation payments and which was maintained by compulsory contributions from employers. New Jersey was the first State to adopt the elective type of workmen's compensation law, with certain penalties attached for non-election. Eight other States also enacted workmen's compensation laws in 1911—California, Nevada, Ohio, Illinois, Wisconsin, Kansas, Massachusetts, and New Hampshire.

Second occupational disease clinic in the United States was started at the Sprague Memorial Institute of the University of Chicago and the Rush Medical College by Dr. Emery R. Hayhurst.

Massachusetts was the first State to forbid the industrial employment of women within 2 weeks before or 4 weeks after childbirth; New York followed in 1912 and Connecticut and Vermont in 1913.

First American law for compulsory reporting of occupational diseases was drafted by the American Association for Labor Legislation and enacted in California in March. Similar laws were passed by Connecticut, Illinois, Michigan, New York, and Wisconsin.

Massachusetts enacted a law intended to protect textile mill operatives from tuberculosis by preventing the use of any form of shuttle in the use of which any part of the shuttle or any thread is put in the mouth or touched by the lips of the operator.

Triangle Waist Co. fire in New York City led to the establishment of the New York Factory Investigating Commission which appointed Dr. George Price to direct its studies of health and safety problems.

Montgomery Ward purchased the first group life insurance contract from the Equitable Life Assurance Society.

First psychological tests for the selection of streetcar motor-men were conducted by Prof. Hugo Münsterberg of Harvard on the Boston Elevated Railway employees.

American Museum of Safety, later to be known as Safety Institute of America, was established in New York City; it had a Department of Industrial Hygiene.

1912 Massachusetts courts deemed the phraseology of the workmen's compensation act sufficiently broad to embrace diseases growing out of employment.

XV International Congress on Hygiene and Demography was held in Washington, D. C., with a large section devoted to industrial hygiene.

Louisiana established the first Division of Child Hygiene in a State Department of Health.

United States Children's Bureau was established to investigate and report on all matters pertaining to the welfare of children and child life.

Fatigue and Efficiency: A Study in Industry by Josephine Goldmark was published.

1913 First State industrial hygiene agencies were established in New York and Ohio, staffed with physicians and engineers.

Ohio and Pennsylvania "lead laws" required monthly examinations of workers employed in the manufacture of certain of the more poisonous lead salts; a physician who discovered a case of lead poisoning was required to report it to the State department of labor and of health and also to the employer who after 5 days must not continue the "leaded" employee in a dangerous process nor return him thereto without a physician's written permit.

National Council for Industrial Safety, name changed to National Safety Council in 1915, was organized to collect information on accidents both within and without industry and to promote accident prevention programs. A Health Service Section was established in 1914.

First union-sponsored service type of medical care plan was started by the International Ladies' Garment Workers' Union as a result of studies by the Joint Board of Sanitary Control in the Cloak, Suit and Shirt, and Dress and Shirt Waist Industries of Greater New York. In 1917 the Union Health Center was incorporated.

First registry for industrial nurses was opened in Boston for the purpose of supplying suitable nurses for the emergency rooms of factories.

First State-wide survey of industrial hygiene problems was begun in Ohio by Dr. Emery R. Hayhurst for the Ohio State Board of Health. His report *Industrial Health Hazards and Occupational Diseases in Ohio* was published in 1915.

Health activities of the United States Bureau of Mines were begun with the loan of Dr. S. C. Hotchkiss from the United States Public Health Service for special studies. Dr. A. J. Lanza also from the Service was Chief Surgeon from 1913 to 1920. The Bureau formalized its health work in 1920 with Dr. R. R. Sayers in charge. In 1926 a Safety and Health Branch was created with Dr. Sayers continuing as its first Chief.

1914 Office of Industrial Hygiene and Sanitation was established in the Division of Scientific Research of the United States Public Health Service.

Section on Industrial Hygiene was organized in American Public Health Association as its fifth section.

First United States Public Health Service studies of industrial hygiene problems were made. Pulmonary diseases in miners in Joplin, Mo. (the Tri-State District) were studied by Dr. A. J. Lanza and Edwin Higgins of the United States Bureau of Mines. Group chest X-rays were used for the first time in this study. An intensive follow-up study was made at a special clinic in Picher, Okla. in 1927 sponsored by the same Federal agencies and the Metropolitan Life Insurance Co. and Tri-State Mine Operators. Another early Public Health Service study was made of the health of garment workers in New York City by Dr. J. W. Schereschewsky at the request and with the cooperation of the Joint Board of Sanitary Control (Public Health Bull. No. 71).

Conference Board of Physicians in Industry was established as the medical advisory committee to the National Industrial Conference Board.

Office of Industrial Hygiene and Sanitation of the United States Public Health Service began to receive periodic reports from about 250 industrial sick benefit associations on the number of cases and number of days of disability among plant population. The first reports based on this data, written by Dean K. Brundage and Bernard J. Newman, were issued in 1919 and 1920.

First modern American texts in the field were published: *The Occupational Diseases* by Dr. W. G. Thompson; *The Modern Factory* by Dr. George M. Price. Other early texts were: *Diseases of Occupation and Vocational Hygiene* edited by Drs. George M. Kober and William C. Hanson, 1916, and *Industrial Medicine and Surgery* by Dr. Harry E. Mock, 1919.

1915 United States Supreme Court upheld the constitutionality of California law which fixed an 8-hour day as the maximum for women workers

First scientific symposium on industrial hygiene and medicine was held at the annual meeting of the American Medical Association.

American Association of Industrial Physicians and Surgeons was organized to raise the standards of industrial medical practice

United States (Walsh) Commission on Industrial Relations issued its 11-volume report on its investigation of industrial unrest and labor-management relations. This included a survey of the sickness prevalent among approximately a million workers of representative occupations.

1916 Child Labor Act was approved but was declared unconstitutional in 1918; the second act passed in 1919 was declared unconstitutional in 1922; this was followed by Child Labor Amendment to the Constitution which thus far has been ratified by 28 of the necessary 36 States

1917 United States Supreme Court held that both compulsory and elective types of State workmen's compensation statutes are valid.

Hawaii was the first jurisdiction of the United States to enact occupational disease compensation legislation, followed by California in 1918, and Connecticut and Wisconsin in 1919.

College of Business Administration of Boston University offered the first course in this country designed particularly for industrial nurses.

Vocational Education (Smith-Hughes) Act became effective, followed by the Vocational Rehabilitation Act in 1918.

Working Conditions Service of the Department of Labor was established as a cooperative activity with the United States Public Health Service Office of Industrial Hygiene and Sanitation.

Causes of Death by Occupation by Louis I. Dublin was published by the Bureau of Labor Statistics; it analyzed the occupational mortality experience of the Metropolitan Life Insurance Co. for the 3 years 1911-13.

1918 Harvard University was the first institution to establish a course of instruction and research leading to degrees in industrial hygiene. This included work in the occupational disease clinic at the Massachusetts General Hospital for students with a medical degree. In 1919 the Medical School of the University of Cincinnati established a 1-year course leading to a certificate of public health in industrial medicine. Yale and Johns Hopkins also provided courses in industrial health to graduate public health students at this time.

Saranac Laboratories of the Trudeau Foundation began its extensive studies on tuberculosis and lung diseases under Dr. L. U. Gardner

1919 First professional periodical dealing with the field of industrial health was the *Journal of Industrial Hygiene*, which in 1936 changed its name to the *Journal of Industrial Hygiene and Toxicology*.

Two of the earliest Nation-wide surveys of medical and surgical services in industrial establishments were published. One was made by Dr. C. D. Selby of the U. S. Public Health Service (Public Health Bulletin No. 99) and the other by the Bureau

of Labor Statistics, U. S. Department of Labor (Bureau of Labor Statistics Bulletin No. 250).

Industrial Nursing by Florence Swift Wright, first book written especially for nurses in industry, was published. A chapter entitled "Nurse in Industry" by Mae Middleton, an industrial nurse of Chicago, appeared in Mock's *Industrial Medicine and Surgery*.

New Jersey established six rehabilitation clinics for industrial workers; those in Newark and Jersey City were under the direction of Dr. H. H. Kessler.

- 1920 Civil Service Retirement and Disability Fund was established for Federal employees.

National Organization of Public Health Nurses established an industrial nursing section

First temporary disability benefits for nonoccupational accident or sickness were provided under group contracts from private insurance companies.

Women's Bureau was established in the United States Department of Labor to study the health and welfare of women in industry.

- 1921 Sheppard-Towner Act was passed; it provided Federal grants to States to promote maternal and infant welfare and hygiene.

Occupation Hazards and [Diagnostic Signs by Louis I. Dublin and Philip Loiboff was published by the Bureau of Labor Statistics; because of its great usefulness as a ready reference it has been revised several times.

Safety Code for Lighting of Factories, Mills and Work Places, sponsored by the Illuminating Engineering Society, and Safety Code for the Protection of Industrial Workers in Foundries, sponsored by the National Foundrymen's Association, were issued by the American Standards Association. Safety Code for the Protection of Head and Eyes of workers was published by the United States Bureau of Standards; the following year it was revised and issued by the American Standards Association. Protection of respiratory organs was added in 1938.

- 1924 Following 18 to 20 deaths among the watch dial painters in New Jersey extensive studies into the health hazards of the radium watch dial industry were made including one by the United States Public Health Service which outlined the methods of control.

- 1925 First American text on industrial toxicology, *Industrial Poisons in the United States*, was written by Dr. Alice Hamilton.

Surgeon General, United States Public Health Service, upon the completion of studies by the Bureau of Mines, several uni-

versities and the oil industry held a conference on the health aspects of the manufacture, distribution, and use of tetraethyl lead gasoline (Public Health Bull. No. 158). As a result, the Public Health Service investigated the hazard and drafted a set of suggested recommendations for adoption by the States.

- 1926 American College of Surgeons appointed its Committee on Industrial Medicine and Traumatic Surgery and adopted the Minimum Standard for Medical Service in Industry.

National Safety Council's Committee on Benzol, C.-E. A. Winslow, chairman, published its final report of studies done by Dr. Leonard A. Greenburg and associates of the United States Public Health Service.

First collective bargaining agreement with a health and welfare clause was between the Public Service Corp. of Newburgh, N. Y., and the Amalgamated Association of Street & Electric Railway Employees. It provided for life insurance and weekly sick benefits.

First city-wide survey of industrial hygiene problems was begun in Nashville, Tenn., in connection with a public-health survey conducted jointly by the City Health Department, the State Health Department, the United States Public Health Service, and the Metropolitan Life Insurance Co.

- 1929 Forerunner of Blue Cross hospital plans was a contract made between school teachers in Dallas, Tex., and Baylor University Hospital. In 1933 the American Hospital Association endorsed the principle of group prepayment for hospital bills and established a list of essentials which should characterize such plans. In 1934 the American College of Surgeons gave its approval to prepayment plans for medical and hospital service.

Psychiatry in Industry by Dr. V. V. Anderson was the report of a 4-year study of the mental health problems of the employees of the R. H. Macy & Co., N. Y., conducted by a psychiatric team employed by the company.

- 1932 Publication of the magazine *Industrial Medicine* was begun; the name was changed to *Industrial Medicine and Surgery* in 1949.

- 1933 National Industrial Recovery Act's industrial codes of fair competition included regulations on hours and on safe and healthful working conditions; they were declared unconstitutional in May 1935.

Committee on the Costs of Medical Care issued its final reports based on a 5-year study of all types of medical services; 4 of the 28 reports dealt with industrial prepayment medical-care plans.

1934 Division of Labor Standards was established in the Department of Labor; it was changed to the Bureau of Labor Standards in 1948.

First National Conference on Labor Legislation was held under the sponsorship of the Department of Labor to obtain closer Federal-State cooperation.

Insurance against the costs of hospitalization was first offered by private insurance companies; group surgical expense insurance was started in 1938, and group medical expense insurance in 1943.

1935 Social Security Act was passed making, among other provisions, Federal funds available to United States Public Health Service for extending research investigations and for making grants-in-aid to the States for public-health work including industrial hygiene. This stimulated the development of State industrial hygiene units.

Safety Code for Industrial Sanitation in Manufacturing Establishments, sponsored by the United States Public Health Service, was issued by the American Standards Association.

First major study of *Anthraco-Silicosis Among Hard Coal Miners* was made in Pennsylvania by the United States Public Health Service at the request of the governor and with the joint support of the anthracite coal operators and the United Mine Workers of America.

1936 Congress passed the Public Contracts Act (Walsh-Healey) which established labor standards on Government contracts; these included requirements for the safety and health of workers.

National Silicosis Conference was called by the Secretary of Labor to discuss the silicosis problem from the viewpoint of the medical man, of the employer, and of the employee. Four committees were appointed: The Committee on the Prevention of Silicosis Through Medical Control, the Committee on the Prevention of Silicosis Through Engineering Control, the Committee on the Economic, Legal, and Insurance Phases of the Silicosis Problem and the Committee on the Regulatory and Administrative Phases of the Silicosis Problem. The final committee reports were published in 1938.

Air Hygiene Foundation, which later changed its name to the Industrial Hygiene Foundation, was organized by some of the largest industrial concerns in the country, the United States Public Health Service, United States Bureau of Mines, and the Mellon Institute.

Seminars were initiated by the Office of Industrial Hygiene and Sanitation, United States Public Health Service, to train

official personnel to implement the grant-in-aid program under the Social Security Act.

United States Public Health Service published a report on the nature and incidence of air pollution in 14 of the largest cities in the country (Public Health Bull. No. 244).

- 1937 American Medical Association created the Council on Industrial Health to coordinate all medical efforts in the industrial health field. In 1939 the Council sponsored its first Annual Congress on Industrial Health.

Industrial Hygiene was established as a Division of the National Institute of Health, United States Public Health Service, to supersede the Office of Industrial Hygiene and Sanitation.

Railroad Retirement Act, which included provisions for sickness and maternity benefits, was passed.

- 1938 American Conference of Governmental Industrial Hygienists was organized to promote sound administration of governmental industrial hygiene activities.

Federal Fair Labor Standards Act was passed; it extended the principals of maximum hours and minimum wages to all workers in industries engaged in interstate commerce.

- 1939 Indiana State Health Department was the first to employ an industrial nursing consultant, followed by Michigan in 1940. American Industrial Hygiene Association was organized to provide a means for exchanging and increasing knowledge of industrial hygiene.

In California and Michigan the first State-wide prepayment medical care plans sponsored by State medical societies were organized; California Physicians' Service began operations in this same year, but Michigan Medical Service did not offer contracts until 1940.

- 1940 National Defense Council, with approval of the President, designated the Federal Security Administrator as coordinator of all health, medical, welfare, nutrition, recreation, and related fields of activity affecting the national defense.

First comprehensive report on the industrial hygiene problems of the Nation based on surveys made in the States under the guidance of J. J. Bloomfield of the Division of Industrial Hygiene, United States Public Health Service, was issued (Public Health Bull. No. 259).

- 1941 A conference of the industries processing hatters' fur, the labor union, and State health officials, held in Connecticut at the request of the Surgeon General of the United States Public

Health Service, reached an agreement to use only nonmercurial compounds in the felt-carroting industry.

Federal Mine Inspection Act was passed, authorizing the United States Bureau of Mines to inspect coal mines and make investigations and recommendations relating to health and safety conditions.

First institute for State industrial nursing consultants was held at the National Institute of Health under the auspices of the Industrial Hygiene Division of the United States Public Health Service.

- 1942 Rhode Island enacted the first State law providing cash sickness benefits to workers for nonoccupational illness and injury covered by its unemployment insurance law. Payments began in April 1943.

War Manpower Commission, with the Federal Security Administrator as Chairman, was created by the President. The United States Employment Service, National Youth Administration, apprenticeship training service, and training-within-industry service was transferred to the War Manpower Commission by Executive order, thus consolidating all authority over employment and employment training within the Commission.

American Association of Industrial Nurses was formed to improve the standards of nursing practice in industry.

United States Army and Navy established occupational health services for the civilian employees in plants and shipyards owned and operated by the armed services.

- 1943 Present structure of the United States Public Health Service was defined and in the following year all laws relating to the United States Public Health Service were consolidated.

First medical benefits, other than weekly sick benefits, provided under a collective-bargaining agreement, became effective for members of the Philadelphia Waist and Dress Joint Board of the International Ladies' Garment Workers' Union.

American Association of Industrial Dentists was founded to promote and improve industrial dental programs.

National Safety Council organized its own industrial nursing section (from 1930-43 NOPHN's section on industrial nursing filled this role).

Federal grants to State health departments were authorized for emergency maternity and infant care for wives and infants of enlisted men in specified grades of the Armed Forces; administrative responsibility for the program was carried by the Children's Bureau.

- 1946 California was the second State to enact a law for cash sickness benefits for nonoccupational illness and injury to workers covered by the State unemployment insurance law. Payments began in December 1946.
 Publication of the magazine *Occupational Medicine* by the American Medical Association was started. This was merged with the *Journal of Industrial Hygiene and Toxicology* in 1950 to form the *Archives of Industrial Hygiene and Occupational Medicine*.
 Congress enacted Public Law 658, the Federal Employees Health Service Act which authorized Federal departments and agencies to provide their employees with health-service programs limited to treatment of on-the-job illness, preemployment examinations, and preventive health programs.
- 1947 First medical services of the United Mine Workers Welfare and Retirement Fund were provided to paraplegic miners.
- 1948 National Labor Relations Board ruled that pension, health, and welfare plans were within the scope of collective bargaining. These rulings were sustained by action of the higher courts in 1949.
 Workmen's compensation legislation became Nation-wide with Mississippi's enactment of such a law.
 New Jersey was the third State to enact a law for cash sickness benefits for nonoccupational illness and injury to workers covered by the State unemployment insurance law. Payments began in January 1949.
 The Federal Government's first national conference on industrial safety met in Washington, D. C.
- 1949 First major study in the United States of the effects of air pollution on health was made by United States Public Health Service in Donora, Pa. (Public Health Bull. No. 306).
 New York was the fourth State to enact a law for cash sickness benefits for nonoccupational illness and injury to employed workers; coverage is slightly different from unemployment insurance. Payments began in July 1950.
 Presidential Board of Inquiry into the labor dispute in the basic steel industry concluded that social insurance and pensions should be considered a part of normal business costs to take care of temporary and permanent depreciation in the human "machine."
 Washington enacted a law for cash sickness benefits for non-occupational illness and injury to workers covered by the State unemployment insurance law; it is subject to referendum on December 7, 1950. Payments were to have been begun in January 1950.

1950 First Technical Conference on Air Pollution was held under the auspices of several Federal agencies including the United States Public Health Service and the United States Bureau of Mines.

The Security Council of the United Nations took official action on the invasion of the Republic of Korea.

The Social Security Act Amendments of 1950, Public Law 734, include among other provisions: the extension of coverage and an increase in benefits under old-age and survivors insurance; an increase in the contribution rate for both employer and employee; Federal grants-in-aid for assistance to needy persons who are permanently and totally disabled.

The Conference on Aging and the Midcentury White House Conference on Children and Youth were held in Washington, D. C.

The Sixteenth National Conference on Labor Legislation recommended an over-all Federal temporary disability law, and stated that if federalization of disability insurance were not feasible immediately the States should adopt disability insurance laws to provide for State funds to be financed wholly by employer contributions.

The National Conference on Workmen's Compensation and Rehabilitation met in Washington, D. C., to consider ways of facilitating the rehabilitation of injured workers.

Definitions and Concepts

Selected Statements in Chronological Order

The problem of the industrial surgeon of today is therefore a far greater one than the relatively simple matter of the handling of trauma, for he should be prepared to handle sanitary, medical, and social problems as well, with at least the following aims in mind: The employee must be physically fit; working conditions must be made safe as possible; proper sanitation, including ventilation, illumination, and temperature control, as well as facilities for bodily cleanliness, must be provided. Furthermore, it must be realized that contentment and efficiency also depend on living conditions in the home and on the health of the worker's family.

Quoted from Noland, Lloyd: "Problems of Administration in Industrial Surgery." *Journal of the American Medical Association*, 99: 1215 (October 8) 1932.

Industrial hygiene is one of the most important topics in preventive medicine and hygiene, as it deals with the health, the welfare and the human rights of the vast majority of the adult population. . . . The object of industrial hygiene is to protect the health of the worker, whether in mines, ditches, factories, stores, ships, farms, banks or houses. The object of industrial hygiene is also to prevent industrial diseases, but the control of special health hazards does not solve the problems of the health of the worker. Industrial hygiene is nearly as broad as adult hygiene itself—indeed, industrial hygiene runs the whole gamut of hygiene and sanitation. It deals with the problems of industrial poisons and dust; ventilation, temperature and humidity; light, noise and nuisances; cleanliness, plant sanitation, overcrowding; hours of labor, rest periods and fatigue; child labor; women in industry; workmen's compensation; medical and nursing service, physical examinations, communicable diseases in the factory, mental health, personal hygiene.

Quoted from Rosenau, M. J.: *Preventive Medicine and Hygiene*, 6th ed. New York, Appleton Century, 1935, p. 1261.

Industrial medicine provides the only social orientation in American medicine. . . . There are two aspects of social medicine: first the study of social factors as the cause of disease, and second, the use of social methods in the control of disease. . . . [Industrial medicine] recapitulates all the elements of social medicine, both theoretical and practical. On the theoretical side it studies the industrial environment as a causative factor in disease. On the practical side it employs all the measures of control found in social medicine.

In industrial hygiene we see the application of measures to control the industrial environment in order to prevent disease and maintain the health of the worker. Socialized medicine . . . the distribution of medical service, so as to care for large numbers of people . . . is noted in the furnishing of partial and sometimes complete medical service by industry to its employees. Social insurance medicine has its counterpart in American workmen's compensation schemes. . . . Medical social work is well-developed in industry, with and without organized social welfare departments.

Quoted from Kessler, Henry H.: "Social Significance of Industrial Medicine." *American Journal of Public Health*, 158-164 (February) 1936.

Industrial hygiene is the science of the preservation of the health of workers. It therefore involves primarily a program for conservation of health and prevention of accidents and occupational disease. Such a program necessarily extends beyond prevention of accidents and occupational diseases; it includes also the broad subject of the health of the worker. It is obvious that some of the problems arise from the nature of the industrial environment itself; namely, the control of poisons, dusts, excessive temperature and humidity, defective lighting, noise, overcrowding, and general plant sanitation. Some of them obviously involve such factors as hours of work, fatigue, communicable diseases in the factory, mental health, and personal hygiene.

Quoted from Sayers, R. R., and Bloomfield, J. J. "Public Health Aspects of Industrial Hygiene." *Journal of the American Medical Association*. 111: 679 (August 20) 1938.

When we take into account the wide difference between the few millions of dollars spent on industrial hygiene by industry and government, and the billions lost due to accidents, occupational diseases and sickness in industry, we are forcefully brought face to face with the meager efforts of our present attempts in the direction of the protection and improvement of the health of our workers.

It would seem, therefore, that if we are to improve the general health status of the most important and numerous group in our population, it will be necessary to control not only unhealthful conditions in the working environment, but also to give consideration to such factors as proper living conditions, nutrition, elimination of strain and hurry, communicable diseases—in fact, a general adult health program for our workers. In order to promote a broad and effective industrial health program of this type, it will be necessary to integrate it closely with existing public health activities.

Quoted from Bloomfield, J. J. "Development of Industrial Hygiene in the United States." *American Journal of Public Health*, 28: 1394 (December) 1938.

The purpose of Industrial Medicine has been and always will be fundamentally the same, namely, "the adequate care of the health of the industrial worker." . . . Obviously [this] requires further elucidation as to indications, application, and limitations. One employer, for instance, may interpret the words "adequate care"

to include only the repair of industrial injuries required by workmen's compensation law. Another employer who is socially minded may interpret the same terms to include complete medical and hospital care of the worker and his family in order to attain "adequate health."

Quoted from Newquist, M. N. *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1938, page 1.

Industrial hygiene is the science of the preservation of the health of the workers. It is concerned with adult hygiene and the elimination of causes of morbidity and mortality whether caused by factors inside or outside of the working environment. Industrial hygiene provides a means through which all the facilities of the health department may be integrated to lower the incidence of morbidity and prolong the life of a large and important section of our population.

Quoted from Gray, Albert S., and Osborn, Stanley H. "The Integration of Industrial Hygiene and Public Health." *Transactions of the Second Annual Conference of Governmental Industrial Hygienists*. Washington, The Conference, 1939, page 11.

Although occupational diseases and accidents still constitute your major activities, . . . there has gradually come about a realization that, in order to bring positive health to the large gainfully employed population, it will be necessary to concern yourselves with other adult health problems. This, as you know, may be accomplished by integrating industrial hygiene with all public health functions, employing the work place as the scene of action.

Quoted from Farran, Thomas. In *Transactions of the Second Annual Conference of Governmental Industrial Hygienists*. Washington, The Conference, 1939, page 2.

Industrial health service as exemplified by [full-time industrial physicians] . . . is fundamentally preventive medicine. Its object is to furnish the employed population the best possible health protection consistent with: (1) The purpose of industry, which is to carry on its business; (2) the employer's responsibilities as fixed by law, which are the prevention, care of, and compensation for occupational injuries and diseases; (3) the duties and objectives of official and non-official health agencies, which are distinctively in the field of preventive medicine; and (4) the employee's rights as to free choice of a physician in the care of sicknesses and injuries, not legally related to occupation. . . . from the standpoint of . . . the foregoing, health service in industry is found to comprise several functions . . . industrial hygiene, physical supervision, therapy, rehabilitation, diagnostic tests, health instruction, records, and research.

The scope of industrial health service may be summarized as follows: It is responsible for the protection of working people against possible sources of disease in the plants, their safe placement, the subsequent supervision of their health in relation to employment and the treatment of conditions that result from occupation. It is the plant physician's privilege and duty to cooperate with the general profession

and departments of health in their respective efforts to treat and reduce general sickness. Industrial medicine, general practice, and the public health are complementary. To conserve human values is their common purpose.

Quoted from Selby, C. D. "Scope and Organization of Health Service in Industry." *Industrial Hygiene* (edited by A. J. Lanza and J. A. Goldberg). New York, Oxford University Press, 1939, page 4.

We may define industrial health as a specialized form of medical and public health practice, combining certain elements of medicine, engineering, chemistry, toxicology, psychology, sociology, statistics, and the principles of the prevention of disease and health promotion, to the end result that the physical and mental efficiency of the worker is increased and production bettered in quality, quantity, and permanence.

Quoted from Sappington, C. O.: *Industrial Health: Asset or Liability*. Chicago, Industrial Commentaries, 1939, page 5.

The purpose of industrial health programs is to promote and maintain the physical and mental welfare of all industrial employees. . . . These objectives should be accomplished by:

1. Prevention of disease or injury in industry by establishing proper medical supervision over industrial materials, processes, environments, and workers.
2. Health conservation of workers through physical supervision and education.
3. Medical and surgical care to restore health and earning capacity as promptly as possible following industrial accident or disease.

Quoted from American Medical Association, Council on Industrial Health: "Medical Service in Industry: Outline of Procedure for Physicians in Industry; Industrial Health Examinations." *Journal of the American Medical Association* 118: 895 (March 14), 1942; 125: 569 (June 24), 1944.

Industrial hygiene is concerned with every phase of the health of the man behind the machine, whether it is the industrial dust in the air he breathes or the food his wife has packed in his dinner pail. In short, it is the problem of keeping the worker on the job, and in good health, so that he can work at top efficiency.

Quoted from Townsend, James G.: "The Problem of Industrial Hygiene." *New Orleans Medical and Surgical Journal*, 95: 505 (May) 1943.

As [industrial] hygienists, you hold an important place in industry and public health in the control of occupational and traumatic diseases primarily the result of chemical and physical agents. Through your training and knowledge of certain basic sciences and in cooperation and consultation with the plant physician you have introduced engineering principles, safety and sanitary sciences, toxicology and control tests, to develop an environment as a safe place for the worker; this is a job that demands eternal vigilance to curtail morbidity and mortality, with emphasis on logical reasoning and observations.

. . . Industrial hygiene and industrial epidemiology are absolutely essential in preventive industrial medicine and cannot be divorced.

Quoted from Legge, Robert T.: "A Historical Background of Industrial Hygiene." *American Industrial Hygiene Association Quarterly* 7: 5 (June) 1946.

Some advances have recently been made but the conception of industrial medicine in this country has, on the whole, remained circumscribed. In some parts of the country it has not developed far beyond its initial interest in traumatic surgery to patch up the injured worker. As workmen's compensation laws have been passed in various States, industrial medicine has centered on accident prevention, in which industrial physicians participate along with safety engineers. When occupational diseases came within the province of the workmen's compensation acts, their control became one of the functions of the industrial physician working with industrial toxicologists and engineers. It is only within recent years that the scope of industrial medicine has come to embrace broader aspects of health promotion and sickness prevention, including nutrition and psychiatry. . . . With fuller collaboration of the medical profession, of employers and labor, and of the government, industrial medicine can play a preventive and a curative role far beyond its present scope.

Quoted from Stern, Bernhard J.: *Medicine in Industry*. New York, The Commonwealth Fund, 1946, pages 185-186.

This whole subject of occupational health and medicine is analogous to a three-legged stool, one leg representing medical science, one representing engineering and chemical science and one representing the social sciences. . . . Up to the present we have been trying to balance ourselves on two legs and in some instances on one leg. It is a very uncomfortable position and one that cannot get us very far and certainly will lead, as it has, to fatigue.

Quoted from Hussey, Raymond. In discussion of article by Hemeon, W. C. L.: "Engineering in Industrial Health Education." *Occupational Medicine*, 4: 204 (August) 1947.

There are at least seven more or less distinct functions involved in the promotion of industrial health [environmental health, health education, preemployment physical examinations, diagnostic services, first aid, treatment of disease, rehabilitation] . . . For the provision of these seven types of service, there are four different agencies in the picture: Industry, labor, the medical profession, and the public; and any two or more of these agencies may cooperate in solving parts of the problem. The possible complexities of administrative relationship stagger the imagination. . . . There is no single, perfect solution of this problem now in sight. There is rather a challenge to the inventiveness of management, labor, the medical profession, and the public to find empirically the best plant that will fit a given local situation. For management and labor, the need for cooperation in the meeting of a common problem is called for rather than insistence on vested inter-

ests. For the medical profession, it seems certain that the principles of group payment and group practice must be essential to any sound solution. For the public-health authorities, leadership in research, formulation of reasonable standards of attainment, and assistance to small industries, where desirable, would appear to be the appropriate role.

Quoted from Editorial, *American Journal of Public Health*, 37: 1337-1339 (October) 1947.

Industrial medicine is concerned as much with the environment as with the man. To study man in his environment, to understand the man and to control his environment as his needs require—these are the essential goals of industrial hygiene. It is clear that these cannot be achieved by physicians alone. They require the collaboration of the social, biologic and physical sciences and disciplines in research, practice and instruction.

Quoted from Kehoe, Robert A.: "Significance of Industrial Health." *Occupational Medicine*, 4: 390 (October-December) 1947.

Industrial health, or industrial hygiene as it is commonly called, is concerned with the prevention of occupational diseases and the maintenance of the health of industrial workers on a high level. It requires the combined efforts of a variety of professional personnel, most important of which are engineers, physicians, chemists, and nurses. The industrial physician and nurse are concerned with the well-being of the worker, while the industrial health engineer and chemist are concerned with the condition or "well-being" of the worker's environment. The entire program is preventive rather than curative in nature.

Quoted from Brandt, Allen D.: *Industrial Health Engineering*. New York, John Wiley & Sons, Inc., 1947, page v.

From the early concepts which made the industrial physician's chief interest the administration of first aid to the injured we have reached a stage of progress where the potential hazards of industry are neutralized before they have actually inflicted harm. From its fragmentary beginnings industrial medicine has attained to the development of highly organized programs of health conservation which affect the well-being of that large part of our population engaged in the labors of industry.

Quoted from Hazlett, T. Lyle: "Industrial Medicine—Historical Notes." *Introduction to Industrial Medicine*. Chicago, Industrial Medicine Publishing Co., 1947, page 6.

Medicine has been inclined to approach the subject [industrial hygiene] in terms of occupational diseases; public health has had a broader approach, regarding workers as individuals who, because of the combined hazards of occupation and industry, including economic disadvantages, constitute a group for which special precautions must be exercised. The precautions applied relate to those hazards peculiar to a given occupation or industry, or both, plus ordinary public-health practices in such fields as nutrition, tuberculosis, syphilis, etc.,

being concerned not only with working conditions but with the worker's home and its environment, with his family, their recreation and health education, and their ability to obtain medical, nursing, dental, and hospital care.

Quoted from Mustard, Harry S.: *An Introduction to Public Health*, second edition, New York, The Macmillan Co., 1947, page 169.

I define industrial *medicine* as the broad field which is concerned with all of the health problems of employed persons, and industrial *health* as the objective of industrial medicine. In other words, industrial health is the end and the practice of industrial medicine is the means. Industrial hygiene I consider to be that subdivision of industrial medicine which deals primarily with the prevention of illness, occupational or nonoccupational, through methods applied to the working environment or to the employed individual.

Quoted from Goldwater, Leonard J.: "Future of Industrial Medicine." *Industrial Medicine*, 17: 27 (January) 1948.

Industrial hygiene is primarily concerned with relationships between the health of the worker and the stresses of his occupation and industrial environment. It has become a special technical field because these relationships can, in large measure, be expressed in quantitative terms. Thus, it becomes possible to measure environmental factors and from the findings to predict their effects upon the workers.

The objective of public health is to promote and maintain good health in the greatest possible number of people through organized mass attack. Industrial hygiene, in its broadest sense, provides the means for such direct attack upon the ills of a most important fraction of our total population. The maintenance of the health and well-being of industrial workers is essential to the economic and social well-being of the Nation.

Quoted from Hatch, Theodore F.: "Expanding Horizons in Industrial Hygiene." *Harvard Public Health Alumni Bulletin*, 5: 9-11 (May) 1948.

By industrial medicine, I mean the whole range of medical art, science and skill applied to industry, including internal medicine, surgery, preventive medicine, and all the ancillary professional skills, such as engineering, chemistry, nursing, etc.

Quoted from Shepard, W. P.: "What Kind of Specialty Is Industrial Medicine?" *Industrial Medicine*, 17: 209 (June) 1948.

Concomitant with the change of status of the American worker, there has been a metamorphosis within recent years in industrial health practices and methods. Reorganizing the demands of modern industrial enterprises for a manpower capable of maintaining ever-rising production schedules, medicine has attempted to offer a program capable of keeping the healthy worker healthy and on the job. Within-plant medical care schemes of two or three decades ago have grown in scope to become the rich preventive medicine services seen

in present day enlightened industry. This demand for better health maintenance of the worker obviously was increased by the exigencies of war but fortunately, the methodologies developed by the industrial health forces have persisted in the peacetime state and are meeting with studied refinement.

Quoted from Felton, Jean Spencer: "Industrial Medicine Comes of Age." *West Virginia Medical Journal*, 44: 239-244 (September) 1948.

Although occupational medicine has been designated in recent years as a specialty, it is by no means a restricted specialism. If properly practiced, it approaches a return to the intimate concern of a physician for his patient, so nobly exemplified by the old family doctor. In this respect occupational medicine stands in sharp contrast to the limited specialties in medicine. For occupational medicine is not interested in the patient's eyes alone, or his allergy, or his heart. It is interested in man and *all* that aids or hinders his welfare. In the rise of preventive medicine, occupational medicine has assumed the foremost role. . . .

Industrial medicine contends that we must cease looking upon the working man as an 8-hour-a-day problem, in which only his occupational environment is of concern. No longer can the industrial laborer be classified as a mechanical component of the machinery of industry. We have realized that the worker is a member of society, whose working, playing, and living is a 24-hour problem. Such a concept entails consideration of all his faculties, his capacities as well as his deficiencies. It includes a program which will safeguard his hearing, his vision, his nutrition, his skills, aptitudes, experience, intelligence, and emotions. It is the object of industrial medicine to utilize the cardiac, the epileptic, the cripple, the blind, the elderly, and all those who desire to work instead of being forced to accept the beneficence perpetrated upon them by an unwitting Government. Man's work is related to his home, his social environment, his philosophy, his economics, and his happiness. Adjustment of these relationships in the largest segment of our adult population can be achieved by utilizing the facilities which industrial medicine has to offer.

Quoted from Johnstone, Rutherford T.: *Occupational Medicine and Industrial Hygiene*. St. Louis, C. V. Mosby Co., 1948, pages 7, 23.

The purpose of industrial hygiene is to preserve and improve the health of industrial workers. . . .

Industrial hygiene has become an important part of public-health activity. Its integration with a broad public-health program requires particular emphasis on (1) the influence of physical and mental characteristics of workers upon the incidence of disability, other than occupational, and (2) the opportunity for extending medical care to millions of workers and their families.

Quoted from Dallavalle, J. M.: *The Industrial Environment and Its Control*. New York, Pitman Publishing Co., 1948, pages 8, 11.

Industrial hygiene may be defined as *the science and art of preserving health through the recognition, evaluation, and control of environmental causes and sources of illness in industry*. It resolves itself into the problem of finding factors or conditions in workplaces that may cause or contribute to the illness or serious discomfort of employees, and of devising methods and means of eliminating or controlling such conditions.

Quoted from Patty, Frank A.: "Preface." *Industrial Hygiene and Toxicology*, volume 1. New York, Interscience Publishers, Inc., 1948, page vi.

The following four points are widely approved by medical authorities as major objectives of a company medical service:

1. To ascertain, by examination, the physical and mental fitness of employees for work.
2. To maintain and improve the health and efficiency of those already employed.
3. To educate the worker in accident prevention and personal hygiene.
4. To reduce lost time and absenteeism from illness or injury.¹

It is unnecessary to belabor the point that the overall objective is to increase the company's profit by having healthier employees who are apt to be safer and more efficient workers.

Quoted from Spears, Ethel M.: *Company Medical and Health Programs* (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, page 5.

Occupational medicine deals with the restoration and conservation of health in relation to work, the working environment and maximum efficiency. It involves prevention, recognition and treatment of occupational disabilities, and requires the application of special techniques in the fields of rehabilitation, environmental hygiene, toxicology, sanitation and human relations.

Quoted from American Medical Association, Council on Industrial Health. In, Brown, Ernest W.: "Recent Developments in the Field of Education in Industrial Medicine." *Southern Medical Journal*, 42: 591 (July) 1949.

Industrial hygiene is concerned primarily with prevention. It is the duty of the industrial hygienist to determine the causes of, and to prevent, industrial illnesses, not to diagnose and treat them. He reports upon the extent of the hazard, if any exists, and its control.

Quoted from Drinker, Phillip: "The Practice of Industrial Hygiene." *American Industrial Hygiene Association Quarterly*, 11: 101 (June) 1950.

Industrial medicine involves the application of two skills—medicine and engineering—it is concerned with the environment of the industrial worker as well as with the effects of that environment upon his physical and mental structure. These two skills are equally essential and no program which does not include their coordinated activity will be effective. . . .

¹ "Medical Service in Industry and Workmen's Compensation Laws," American College of Surgeons, Chicago, Ill., 1946.

The industrial physician is concerned with occupational diseases, occupational injuries, preventive medicine, and administration, including the maintenance as well as the utilization of records, and the function of industrial nursing. We must also add to the foregoing the peculiar hazards of radiant energy. It should be noted that increasing emphasis is being placed upon the preventive aspects of the physician's work. In addition there are certain related subjects which are of utmost importance as well as of increasing complexity in both their scope and administration. In this second group are included the following:

1. Workmen's compensation and also the application of insurance principles to benefits for nonoccupational injury and sickness, including hospitalization and dependency benefits. Both the full-time industrial physician and the part-time physician need to be thoroughly conversant with both the occupational and nonoccupational types of benefit. In every instance these benefits cannot become operative, as far as the individual worker is concerned, without the physician's signature. The expansion of both occupational and nonoccupational benefits marks one of the great social advances of our times and the physician who comes into contact with these laws and contracts needs to be conversant with both their content and underlying philosophy.

2. Rehabilitation, which is at last beginning to come into its own. Included here are not only the rehabilitation of those maimed by accident but also those suffering from organic disease—the diabetic and the cardiac and hypertension cases.

3. Geriatrics and its application to the needs of the workers in the older age groups. Here is a challenge to the industrial physician which is becoming more emphatic with every passing year.

4. Psychiatry—the application of psychiatric techniques in recognizing and dealing with emotional conflicts among industrial workers. As has been expressed on more than one occasion, we do not need a psychiatrist in every industrial plant, but we do need psychiatry in industry.

Quoted from Lanza, A. J.: "Education in Industrial Medicine." *American Journal of Public Health*, 40: 731-732 (June) 1950.

SECTION III

The Health Status of the Working Population and the Classification of Industrial Health Hazards

Disability and Mortality in the General Population

Collection of Data on Illness and Disability

Sickness surveys differ radically in the type of data collected, apart from differences in the efficiency of their conduct and the completeness of the data collected. Two types may be differentiated as follows:

1. Case finding surveys, such as attempts to locate all crippled children or all blind persons within a given county. Because of the relative infrequency of the cases sought, it would be too expensive to make a house-to-house canvass of the whole area; instead, the investigator puts his attention upon locating cases, following every lead that suggests a case, but visiting only households or establishments where there is reason to suspect the presence of a case. In such a survey the investigator uses for rate purposes the population as enumerated in or estimated from the decennial or other census.

2. The house-to-house canvass of an unselected group of families—that is, certain blocks, streets, or subdivisions are completely canvassed by visiting every household and asking the same questions about the well and the sick. This type of canvass provides its own population with the same information about age, sex, occupation, income, etc., for both the well and the sick, thus affording data for the computation of rates for any classification that is carried on the schedule.

This second type of survey may be divided into two further types according to the nature of the sickness data collected:

(a) In the *prevalence* survey, each family is asked only about illness existing on the day of the enumerator's visit. This method should afford maximum completeness in the recorded data, inasmuch as the housewife is not expected to remember prior illnesses, but only those that are in existence when she is interviewed. If, in addition, the record includes only cases that can be objectively defined, such as those causing inability to work or pursue usual duties, the record should be particularly complete. However, the recorded cases of illness will be heavily weighted by chronic diseases because the chronic case that lasts for a year or more will be present on any day that the enumerator calls, but many minor colds and digestive disturbances that have occurred within the last few months will be unrecorded because the patient has recovered and is well on the day of the visit. A second difficulty lies in the fact that the amount of illness recorded varies considerably with the season of the year when the survey is made.

(b) In the *incidence* survey, the housewife is asked for a record of illnesses that have occurred during a given period such as 1 month, 3 months, or 1 year, whether or not the person is sick on the day of the canvass. In such a record there is a more normal balance between acute and chronic cases, inasmuch as the many short duration, minor affections have a place in the record as well as the chronic ailments that exist on the day of the visit. The disadvantage of this method is that the housewife cannot be expected to remember and report completely upon more than a rather short period back of the date of the survey. Thus if one attempts to get a record for a 12-month period, the illnesses for the earlier months will be less completely reported than those for the months near the date of the visit. Therefore, one must inquire only for the severe illnesses if he expects the record to be complete for the entire year. To avoid this loss of minor cases in the earlier months, the *periodic* incidence survey has been developed, by which the families are canvassed at fairly frequent intervals and at each visit a record is made of illnesses that have occurred since the preceding visit. Several studies of this kind have been made with visits at 2- to 4-month intervals. However, to get a reasonably complete record of minor affections it is necessary to visit the families at monthly intervals; and to record all of the trivial respiratory attacks, experience has indicated that the reports must be secured at intervals of 1 to 2 weeks and from each individual rather than some other informant. . . .

The most extensive study that pertained primarily to illness was the National Health Survey which was conducted by the United States Public Health Service in 1935-36 under a grant of funds from the Works Progress Administration. Since it was impracticable in this study to visit families more than once, the record was limited to (1) those illnesses that were serious enough to cause inability to work or pursue other usual activities for 7 consecutive days or longer during the 12 months preceding the visit, and (2) serious physical impairments, handicaps, and chronic diseases that were present, but not necessarily disabling, on the day of the visit. This survey covered a total of over 2 million people living in 83 cities in 18 States, geographically distributed throughout the country. The data collected represent by far the largest mass of sickness records ever assembled by house-to-house canvasses.

Quoted from Collins, Selwyn D.: "Sickness Surveys." *Administrative Medicine: The Nelson Loose-Leaf Medicine*, (edited by Haven Emerson, M. D.), 7: 611-636. 1950 (in press).

Factors Influencing the Disability Rate

The prevalence of disability depends in large part on the personal characteristics of the individuals comprising the general population or the special group to which the statistics apply. Among the factors that are specially important are age, sex, employment, and income.

AGE. With increasing age, time lost on account of disability increases. . . . Statistics on the incidence of cases of sickness and disability show that older persons lose more time through sickness not chiefly because they become sick more frequently, but rather because when they do become sick their disability lasts longer. Older persons are slower to recover from diseases common to all age groups, and they are, moreover, especially subject to types of illness which tend to run a long or chronic course.

SEX. Available data tend to show that females experience more disabling sickness than males. . . . [The following] statistics are based on the findings of the National Health Survey and apply to persons aged 15-64:

Sex and employment status:	<i>Average annual days of disability per person</i>
Males.....	7. 5
Females.....	15. 4
Gainfully employed.....	11. 1
Housewives.....	17. 6

According to these figures, females lose as a result of disability twice as much time per year as males. This ratio between males and females would be lower if the comparison were limited to gainful workers of both sexes, because—among other possible reasons—housewives are an older group than gainfully employed women. In any comparison intended to determine differences in disability rates attributable to sex, allowance, or adjustment must be made for differences in age distribution between the groups being compared.

It has also to be kept in mind that there are differences in the criteria of what constitutes disability for persons in the labor force, which includes most of the men, and for those in other pursuits, like housework, which includes most of the women. . . .

EMPLOYMENT. Disability is far more prevalent among unemployed than among employed persons. This is illustrated by the figures . . . derived from the National Health Survey, on the relative prevalence of disability among employed and among unemployed workers aged 15-64.

Employment status:	<i>Average annual days of disability per person</i>
Employed.....	6. 9
Unemployed.....	15. 2

Such data are often interpreted to mean that unemployment is a primary cause of disability, because unemployment is attended by lowered standards or levels of living, reduced access to medical care, and other factors adverse to health. This is partly correct. However, the converse is also correct, namely, that disability is a cause of unemployment. . . .

INCOME. National Health Survey findings for gainfully occupied persons aged 15-64 present the picture illustrated [below] regarding disability rates for different income levels. Like the unemployed, those on relief and in the low-income groups are presumed to be a breeding ground for disablement. The figures show larger than average amounts of disability among those on relief and among those having the lowest incomes . . . as in the case of unemployment, disability may be a cause as well as a consequence of low income, and the disability rate may reflect this relationship.

Annual family income and relief status:	<i>Average annual days of disability per worker</i>
Relief.....	13. 8
Nonrelief:	
Under \$1,000.....	9. 1
\$1,000 to \$1,499.....	5. 8
\$1,500 to \$1,999.....	5. 7
\$2,000 to \$2,999.....	5. 7
\$3,000 to \$4,999.....	5. 5
\$5,000 and over.....	5. 2

OTHER FACTORS. Disability varies to a greater or lesser extent with many other factors, such as marital status, race, occupation, and season of the year.

Quoted from Falk, I. S., Sanders, Barkev S., Federman, David: *Disability Among Gainfully Occupied Persons* (Social Security Board, Bureau of Research and Statistics Memorandum No. 61). Washington, Government Printing Office, 1945, pages 7-9.

National Estimates of Disability

A national estimate of the prevalence of disability for 1939, which makes use of the findings of the National Health Survey and of other data and adjusts them for recognized limitations, indicates that on an average day of the year there are approximately 7 million disabled persons in the United States. These are persons of all ages who, because of defects with which they were born, accidents, or disease, are unable—temporarily or permanently—to engage in gainful occupation or to follow other normal pursuits. According to this estimate, about 55 per 1,000 persons in the total population are disabled on an average day.¹

From an economic standpoint, the loss to the community and to the family is all the greater if the disabled person is one who, but for the disability, would have been a worker. The estimated distribution of the 7 million disabled persons according to employment status is shown in table 1. [See table 34.] The aggregate decrease in the potential labor force as a result of disability is not 1¼ million persons, as this tabulation might suggest at first glance, but rather about 3¼ million.

¹ It should be emphasized that this figure of 7 million is only approximate. It may be regarded as a reasonable midpoint within a range of figures derived from the source data. It is intended only to indicate the general magnitude of the number of disabled persons in a recent year. The limitations which surround this figure also apply to the subdivisions of the 7 million total.

In addition to the 1¼ million disabled workers, there are those persons with more protracted disabilities who have gradually come to regard themselves, and to be regarded, as permanently disabled. These persons either have never been able to enter the labor force or have withdrawn from the labor force and ceased to be gainful workers. . . .

In the first section of chart 1 [see table 35] the 7 million disabled persons on an average day are classified by duration of disability. . . . In the second part of chart 1, the estimates show the prevalence of disability among workers and among former or "would-be" workers—persons unable to work by reason of disability. As indicated earlier, the number of disabled among these persons in ages 14–64 has been estimated as 3¼ million, or about 6 percent of the total civilian labor force. . . . Disabilities which have already lasted a year or more would be found on the average day among about 1 million of the 3¼ million disabled workers.

Quoted from Falk, I. S., Sanders, Barkev S., Federman, David: *Disability Among Gainfully Occupied Persons* (Social Security Board, Bureau of Research and Statistics Memorandum No. 61). Washington, Government Printing Office, 1945, pages 3–4.

Several questions relating to disabling illness among persons from 14 to 64 years of age were added to the schedule of the Census Bureau's Current Population Survey in February 1949. These questions were designed to get an estimate of the number of persons between those ages in the civilian noninstitutional population who, on the day of enumeration, were unable to do their regular work or other duties because of illness or a disabling condition¹ or who had a long-term physical or mental condition that allowed them to work only occasionally or not at all. . . .

The survey revealed that on an average weekday in February 1949 there were 4,569,000 persons from 14 to 64 years of age in the civilian noninstitutional population of the United States who were unable to work because of illness or a disabling condition. Since there was no important epidemic of upper respiratory disease in the country at that time, this figure is not as heavily weighted with short-duration cases as it might be in other winters. However, experience in other studies indicates that February may be the highest or next-to-highest month in the year in prevalence of disabling illness. . . . Of the total number disabled, 2,417,000, or 53 percent, had been disabled for 3 months or longer at the time of visit. Except for approximately 1 percent for whom duration of disability was not reported, the remainder had been disabled less than 3 months.

Quoted from Woolsey, Theodore D.: "Estimates of Disabling Illness Prevalence in the United States." *Public Health Reports*, 65: 163, 181 (Feb. 10) 1960.

¹ "Disabling condition," as used here and elsewhere in this report, is distinguished from disabling illness only in that the former prevents the person from working or carrying on his or her usual activities without currently causing illness in the ordinary sense.

The most recent study of disability in the United States as a whole—the National Health Survey—indicated that on an average day in 1939 about 7 million Americans of all ages were prevented by disability from following their normal pursuits. Adjusted to 1948, the national survey data would indicate about 8 million disabled.

More recent estimates are available on disability among persons of working age. A special inquiry by the Census Bureau in February 1949, made in connection with its monthly report on the labor force, showed that about 4.6 million persons aged 15 to 65 were disabled on the day of the canvass. Of these, 2.1 million had been disabled for more than 6 months.

Disability varies considerably with different groups of the population. Beginning with the young adults, the time lost from normal pursuits on account of disability rises sharply with increasing age. The older groups appear to lose more time, not chiefly because they are sick more often but because their illnesses last longer. Women employed outside their homes lose nearly half again as much time on the average as employed men. The unemployed, and low-income groups generally, suffer proportionately more disability than the working population as a whole.

The aggregate amount of time lost through sickness in 1943 was estimated by the Twentieth Century Fund at over 1 billion man-days of work. Loss of earnings due to temporary disability was estimated at 3 to 4 billion dollars. At current wage levels, the Social Security Administration estimates loss of wages and earnings by permanently disabled persons at about 10.5 billion dollars a year.

Quoted from McNickle, R. K.: *Compensation for Disability*, volume II. Washington, Editorial Research Reports, 1949, pages 798-799.

Sickness and disability cut down a worker's earnings. Equally the sick man's inability to work on certain days reduces the Nation's total production—the number of automobiles, the amount of food, the operation of essential services—by the amount that the worker would have produced had he been well. These economic facts give us a basis for estimating the loss.

The value of all goods and services, including wages and salaries paid, amounted to \$230,000,000,000 in the United States last year. About 60,000,000 people were employed, so each one produced an average of about \$3,800 of the total. By applying this figure to days absent from work because of illness, total or partial disability, we can get a rough idea of our national losses.

SHORT-TERM SICKNESS. The category called "short-term sickness" includes all absences because of sickness or injury that last from 1 day to 6 months. During 1947 the total loss of time from these causes averaged 6 days per worker.

At 1947 rates of production, short-term sickness cost the Nation at least \$5,000,000,000 in lost production and wages.

INCAPACITATION. A sickness or injury that keeps a worker away from his job for 6 months or longer is classed as a total, though not necessarily a permanent, disability. About 3,000,000 workers were incapacitated in this way during 1947 because of chronic diseases, accidents, or other causes.

At 1947 rates of production, their disabilities cost the Nation \$11,000,000,000 in lost production and wages.

PARTIAL DISABILITY. Millions of workers suffer partial disabilities which do not keep them from the job, but which nevertheless do prevent them from working and earning at full capacity.

The total loss from such causes is difficult to estimate, but about a third of all those thus partially disabled would normally be full-time workers. The statistics on workmen's compensation and on disabled veterans indicate that the annual loss may be as great as that for sickness and total disability combined.

It is conservative then to estimate that, for 1947, the loss from partial disability is at least equal to that from total disability alone—\$11,000,000,000 in lost production and wages.

THE NATIONAL LOSS. On this basis the total losses for the Nation in 1947 were:

Causes:	<i>Annual loss</i>
Short-term sickness.....	\$5, 000, 000, 000
Incapacitation.....	11, 000, 000, 000
Partial disability.....	11, 000, 000, 000

The Nation thus lost \$27,000,000,000 during 1947 in potential production and wages through sickness, partial and total disability.

Quoted from Ewing, Oscar R.: *The Nation's Health: A Report to the President.* Washington, Government Printing Office, 1948, pages 26-27.

In a broad sense, the costs of ill health for a man and the Nation as a whole are incalculable. Only the monetary costs employees incur for medical care of themselves and their dependents, and the wage loss they suffer primarily through temporary total disability of non-occupational origin are measurable.

On the basis of the most recent data, it appears that in the United States each worker loses on the average 7.5 work days a year through temporary total nonoccupational disability—that is, disability lasting not more than 6 months.

In the absence of any compensation during illness, this loss in work-time is equivalent to 3 percent of workers' annual earnings. Applying this rate to the total wages and salaries of the Nation, exclusive of the Armed Forces, the total wage loss in 1948 would have been more than 3.9 billion dollars, with allowance for sick pay given salaried employees and certain groups of wage workers. An additional 7 billion dollars or more is lost by some 3 million potential workers as a result of total disability that lasts longer than 6 months. The loss

from partial disability is perhaps at least as great as the combined loss from total disability regardless of duration, or about 10 billion dollars. Thus the total wage loss attributable to total and partial disability in 1948 probably approximated 20 billion dollars.

Quoted from Sanders, Barkev S.: In a volume dealing with employment and wages prepared for the Twentieth Century Fund by W. S. Woytinsky and associates, to be published in 1951.

Table 34.—Estimated number of disabled persons¹ on an average day, by employment status, United States, 1939²

Employment status	Number of disabled persons (in thousands)
Total.....	7,000
Children under age 14.....	1,400
Employed and unemployed workers (aged 14 and over).....	1,280
Housewives under age 65.....	1,250
All other persons under age 65.....	2,250
Not in institutions but unable to work.....	1,500
In institutions ³	750
All other persons aged 65 and over.....	850
Not in institutions.....	700
In institutions ³	150

¹ Represents persons of all ages who, because of defects with which they were born, accidents, or disease, are unable—temporarily or permanently—to engage in gainful occupation or to follow other normal pursuits.

² Based on the National Health Survey, 4 monthly sample surveys, and other miscellaneous data.

³ Includes mental institutions, tuberculosis sanatoria, and homes for the aged, infirm, and needy. One half of the persons aged 65 and over in homes for the aged, infirm, and needy were assumed to be disabled.

Source: Falk, I. S., Sanders, Barkev S., and Federman, David: Disability Among Gainfully Occupied Persons (Social Security Board, Bureau of Research and Statistics Memorandum No. 61). Washington, Government Printing Office, 1948, p. 3.

Table 35.—Estimated number and percentage distribution of disabled persons¹ in the population and in the labor force on an average day, by duration of disability, United States, 1939²

Duration of disability	Persons disabled in the—	
	Population (in thousands)	Labor force ³ (in thousands)
	Number	
All durations.....	7,000	3,250
Less than 6 months.....	3,900	1,750
6 months or more.....	3,400	1,500
1 year or more.....	2,600	1,000
	Percentage distribution	
All durations.....	100.0	100.0
Less than 6 months.....	51.0	54.0
6 months or more.....	49.0	46.0
1 year or more.....	37.0	31.0

¹ Represents persons of all ages who, because of defects with which they were born, accidents, or disease, are unable—temporarily or permanently—to engage in gainful occupation, or to follow other normal pursuits.

² Based on the National Health Survey, 4 monthly sample surveys, and other miscellaneous data.

³ Includes persons who presumably would have been in the labor force had they not been disabled.

Source: Falk, I. S., Sanders, Barkev S., and Federman, David: Disability Among Gainfully Occupied Persons (Social Security Board, Bureau of Research and Statistics Memorandum No. 61). Washington, Government Printing Office, 1948, p. 5.

Table 36.—Percentage distribution of disabled persons in the civilian non-institutional population, 14 to 64 years of age, by duration of disability prior to day of visit, United States, February 1949¹

Age (by years) and sex	Number disabled (in thousands)	Percentage distribution by duration of disability								
		Total	Not over 1 week	Over 1 week but not over 1 month	Over 1 month but not over 3 months	Over 3 months but not over 6 months	Over 6 months but not over 1 year	Over 1 year but less than 10 years	10 years and over	Duration not reported
Both sexes (14 to 64).....	4,589	100	24.8	15.1	8.6	5.4	8.9	22.5	13.6	1.2
14 to 19.....	387	100	52.2	9.8	6.2	3.9	4.1	5.9	17.5	.5
20 to 24.....	364	100	38.8	15.8	11.2	3.8	2.5	11.2	15.8	.8
25 to 34.....	650	100	31.6	18.9	8.0	3.8	7.2	18.1	10.9	1.5
35 to 44.....	797	100	26.7	20.1	9.0	6.5	7.1	18.7	10.9	1.0
45 to 54.....	1,044	100	19.4	16.0	9.4	5.2	12.1	25.3	11.4	1.3
55 to 64.....	1,330	100	12.6	11.0	8.1	6.6	11.4	32.6	16.5	1.1
Male (14 to 64).....	2,341	100	17.7	12.5	8.3	6.0	10.9	29.0	14.4	1.2
14 to 19.....	196	100	50.3	6.1	6.1	3.6	7.1	4.6	21.3	1.0
20 to 24.....	160	100	29.5	13.4	8.1	3.4	3.4	20.8	21.5	-----
25 to 34.....	274	100	20.0	11.3	8.7	5.1	9.8	31.6	11.6	1.8
35 to 44.....	366	100	22.3	17.2	7.9	7.1	9.8	24.0	11.2	.5
45 to 54.....	566	100	13.2	14.6	10.8	6.0	11.1	31.6	11.1	1.6
55 to 64.....	791	100	7.7	10.5	7.1	7.1	14.0	36.2	16.2	1.3
Female (14 to 64).....	2,228	100	32.1	17.9	9.0	4.7	6.7	15.7	12.7	1.2
14 to 19.....	191	100	54.2	13.5	6.2	4.2	1.0	7.3	13.5	-----
20 to 24.....	214	100	45.2	17.5	13.4	4.1	1.8	4.6	12.0	1.4
25 to 34.....	376	100	40.1	24.4	7.4	2.9	5.3	8.2	10.3	1.3
35 to 44.....	431	100	30.4	22.5	10.0	6.0	4.9	14.2	10.7	1.4
45 to 54.....	478	100	26.8	17.6	7.7	4.2	13.2	17.8	11.7	1.0
55 to 64.....	539	100	19.7	11.7	9.6	5.9	7.6	27.5	17.1	.9

¹ Estimates are based on the Census Bureau's Current Population Survey for February 1949, covering approximately 25,000 households in 68 sample areas in 42 States and the District of Columbia.

Source: Woolsey, Theodore D.: "Estimates of Disabling Illness Prevalence in the United States." Public Health Reports, 65: 163-184 (Feb. 10), 1950.

Table 37.—Estimated number of persons with a disabling illness or condition in the civilian noninstitutional population, 14 to 64 years of age, by age, sex, and employment status, United States, February 1949¹

[Number of disabled persons (in thousands)]

Age (by years) and sex	Total in and out of labor force	In labor force survey week—employed			Not in labor force survey week				
		Total	In agriculture	In other industry	Unemployed	Keeping house	In school	Unable to work	Other
Both sexes (14 to 64).....	4,589	1,425	228	1,197	175	1,230	189	1,206	345
14 to 19.....	387	77	11	67	14	36	160	66	35
20 to 24.....	364	127	10	117	10	102	14	75	36
25 to 34.....	650	240	24	217	22	213	16	126	35
35 to 44.....	797	299	36	263	47	262	-----	136	51
45 to 54.....	1,044	344	56	287	48	285	-----	289	80
55 to 64.....	1,330	339	92	247	35	334	-----	514	111
Male (14 to 64).....	2,341	983	218	765	143	9	104	855	248
14 to 19.....	196	46	11	36	7	-----	78	44	21
20 to 24.....	150	61	10	51	7	-----	12	46	24
25 to 34.....	274	139	24	116	19	5	14	78	19
35 to 44.....	366	204	34	170	37	-----	-----	90	34
45 to 54.....	566	264	54	209	43	2	-----	204	54
55 to 64.....	791	269	85	184	31	2	-----	393	97
Female (14 to 64).....	2,228	442	10	432	32	1,221	85	351	97
14 to 19.....	191	31	-----	31	7	36	82	22	14
20 to 24.....	214	66	-----	66	8	102	2	29	12
25 to 34.....	376	101	-----	101	3	206	2	43	16
35 to 44.....	431	95	2	93	10	262	-----	46	17
45 to 54.....	478	80	2	78	5	233	-----	85	26
55 to 64.....	539	70	7	63	4	332	-----	121	14

¹ Estimates are based on the Census Bureau's Current Population Survey for February 1949, covering approximately 25,000 households in 68 sample areas in 42 States and the District of Columbia. The figures, therefore, are subject to sampling variability which may be relatively large in the case of the smaller figures and small differences between figures. Each cell of the tables was estimated separately; hence, the detail figures do not in all cases add to give the exact total shown.

Source: Woolsey, Theodore D.: "Estimates of Disabling Illness Prevalence in the United States." Public Health Reports, 65: 163-184 (Feb. 10) 1950.

Table 38.—Estimated percent of persons with a disabling illness or condition in the civilian noninstitutional population, 14 to 64 years of age, by age, sex, and employment status, United States, February, 1949¹

[Percent of disabled persons in each group]

Age (by years) and sex	Total in and out of labor force	In labor force survey week—employed			Not in labor force survey week				
		Total	In agriculture	In other industry	Unemployed	Keeping house	In school	Unable to work	Other
Both sexes (14 to 64).....	4.72	2.62	3.62	2.49	5.70	4.26	2.34	100	31.77
14 to 19.....	3.12	1.91	1.36	2.08	2.92	3.53	2.39	100	28.69
20 to 24.....	3.20	1.99	1.79	2.01	1.61	3.20	1.37	100	37.11
25 to 34.....	2.86	1.76	1.94	1.75	3.53	2.72	4.72	100	28.23
35 to 44.....	3.93	2.30	2.57	2.27	8.53	4.05	-----	100	45.95
45 to 54.....	6.17	3.29	4.86	3.09	11.03	5.14	-----	100	40.40
55 to 64.....	10.16	4.90	8.08	4.28	9.66	6.89	-----	100	25.52
Male (14 to 64).....	4.98	2.55	3.99	2.31	6.28	(*)	2.36	100	29.67
14 to 19.....	3.24	1.95	1.51	2.21	2.35	(*)	2.40	100	23.86
20 to 24.....	2.76	1.51	2.04	1.44	1.51	(*)	1.46	100	39.24
25 to 34.....	2.54	1.41	2.27	1.32	4.15	(*)	4.59	100	22.89
35 to 44.....	3.71	2.20	2.89	2.10	9.18	(*)	-----	100	45.33
45 to 54.....	6.78	3.45	5.51	3.14	12.65	(*)	-----	100	36.49
55 to 64.....	12.12	4.96	8.20	4.20	9.90	(*)	-----	100	25.46
Female (14 to 64).....	4.48	2.80	1.21	2.88	4.03	4.23	2.31	100	38.80
14 to 19.....	3.01	1.86	-----	1.95	3.87	3.56	2.39	100	41.18
20 to 24.....	3.60	2.52	-----	2.91	1.94	3.20	.99	100	35.83
25 to 34.....	3.16	2.66	-----	2.79	1.82	2.66	5.88	100	39.02
35 to 44.....	4.14	2.66	0.89	2.67	6.76	4.05	-----	100	47.22
45 to 54.....	5.55	2.85	1.16	2.96	5.26	5.12	-----	100	52.00
55 to 64.....	8.21	4.69	6.86	4.53	7.55	6.85	-----	100	25.93

¹ Estimates are based on the Census Bureau's Current Population Survey for February 1949, covering approximately 25,000 households in 68 sample areas in 42 States and the District of Columbia. The figures therefore, are subject to sampling variability which may be relatively large in the case of the smaller figures and small differences between figures. Each cell of the tables was estimated separately; hence, the detail figures do not in all cases add to give the exact total shown.

² Percentages not shown were based on an estimate of less than 100,000 population for all ages.

Source: Woolsey, Theodore D.: "Estimates of Disabling Illness Prevalence in the United States." Public Health Reports, 65: 163-184 (Feb. 10) 1950.

Table 39.—Estimated number of disabled persons per 100 in the civilian noninstitutional population 14 to 64 years of age, by duration of disability, prior to day of the visit, sex, and race, United States, February 1949

Sex and duration of disability	Total disabled	Race	
		White	Nonwhite
Both sexes.....	4.72	4.50	6.87
1 month or less.....	1.88	1.78	2.91
Over 1 month but not over 3 months.....	.41	.39	.56
Over 3 months but not over 6 months.....	.25	.26	.16
Over 6 months.....	2.12	2.02	3.14
Duration not reported.....	.05	.05	.10
Male.....	4.98	4.86	6.16
1 month or less.....	1.50	1.41	2.43
Over 1 month but not over 3 months.....	.41	.41	.45
Over 3 months but not over 6 months.....	.30	.33	-----
Over 6 months.....	2.70	2.67	3.05
Duration not reported.....	.06	.05	.17
Female.....	4.48	4.16	7.49
1 month or less.....	2.24	2.13	3.30
Over 1 month but not over 3 months.....	.40	.38	.65
Over 3 months but not over 6 months.....	.21	.20	.29
Over 6 months.....	1.57	1.40	3.21
Duration not reported.....	.05	.05	.04

Source: Based on the Census Bureau's Current Population Survey for February 1949, covering approximately 25,000 households in 68 sample areas in 42 States and the District of Columbia.

Table 40.—Estimated days of disability per person in the civilian noninstitutional population 14 to 64 years of age, by duration of disability prior to day of visit, by sex and race, United States, February 1949

Sex and duration of disability	Total disabled	Race	
		White	Nonwhite
Both sexes.....	17.23	16.42	25.08
1 month or less.....	6.86	6.50	10.62
Over 1 month but not over 3 months.....	1.50	1.42	2.04
Over 3 months but not over 6 months.....	.91	.95	.68
Over 6 months.....	7.74	7.37	11.46
Duration not reported.....	.18	.18	.36
Male.....	18.18	17.74	22.48
1 month or less.....	5.48	5.15	9.05
Over 1 month but not over 3 months.....	1.50	1.50	1.64
Over 3 months but not over 6 months.....	1.10	1.20
Over 6 months.....	9.86	9.75	11.13
Duration not reported.....	.22	.18	.62
Female.....	16.35	15.18	27.34
1 month or less.....	8.18	7.77	12.04
Over 1 month but not over 3 months.....	1.46	1.39	2.37
Over 3 months but not over 6 months.....	.77	.73	1.06
Over 6 months.....	5.73	5.11	11.72
Duration not reported.....	.18	.18	.15

Source: Based on the Census Bureau's Current Population Survey for February 1949, covering approximately 25,000 households in 68 sample areas in 42 States and the District of Columbia.

Table 41.—Annual incidence of acute and chronic disabling illnesses, by age group and family income group, 83 cities, 1935-36¹

Age group and family income group	Disabling illnesses per 1,000 persons ²					
	All illnesses	Acute illnesses	Chronic illnesses			
			All	Disabling for less than 12 months	Disabling for 12 months	
					All	Noninstitutional
White and Negro						
All ages.....	171	123	48	36	12	11
Under 15.....	214	198	16	13	3	2
15 to 24.....	131	109	22	18	5	4
25 to 64.....	153	96	57	44	13	12
65 and over.....	279	102	177	114	63	62
White						
All ages.....	171	124	47	35	12	11
Under 15.....	225	208	16	13	3	2
15 to 24.....	129	107	22	17	5	4
25 to 64.....	150	94	56	43	13	12
65 and over.....	276	101	174	113	61	60
All incomes.....	171	124	47	35	12	11
Relief.....	238	167	72	60	22	20
Less than \$1,000.....	180	123	58	41	16	15
\$1,000 to \$1,999.....	152	115	37	29	8	7
\$2,000 to \$2,999.....	146	110	36	29	6	6
\$3,000 or more.....	146	109	37	31	6	6

¹ Represents all illnesses disabling for 7 days or more and all hospital cases, confinements, and fatal cases. Based on National Health Survey data.

² 2,152,740 white persons and 198,211 Negroes.

Source: Hollingsworth, Helen; Klem, Margaret C.; Baney, Anna Mae: Medical Care and Costs in Relation to Family Income, 2d ed. (Social Security Administration, Bureau of Research and Statistics Memorandum No. 51). Washington, Government Printing Office, 1947, p. 77.

Most Frequent Causes of Disabling Illness

Table 42.—Annual incidence of disabling illnesses, by diagnosis group and age group, 83 cities, 1935-36 ¹

Diagnosis group	Disabling illnesses per 1,000 persons ²				
	All ages	Under 15	15-24	25-64	65 and over
All causes.....	171.4	224.6	128.8	149.6	275.6
Communicable diseases.....	30.3	105.4	12.4	5.0	2.3
Respiratory diseases.....	50.0	74.2	37.1	42.2	58.6
Pneumonia.....	4.6	8.0	2.3	3.4	8.5
Tonsillitis.....	10.2	24.8	9.1	4.0	.8
Other ³	35.2	41.4	25.8	33.9	49.3
Digestive diseases.....	12.6	7.5	13.8	13.8	19.6
Appendicitis.....	5.2	3.9	10.8	4.4	.9
Other ⁴	7.4	3.6	3.0	9.4	18.7
Puerperal state—live births only.....	13.9	.02	27.6	17.2	-----
Accidents.....	15.6	10.9	13.1	17.2	27.1
Tuberculosis, all forms.....	1.3	.5	1.5	1.7	.9
Nervous and mental diseases.....	5.5	2.6	3.9	6.8	9.9
12-month institutional cases.....	.5	.1	.4	.8	.6
Rheumatism.....	5.6	1.2	1.5	7.1	22.8
Degenerative diseases ⁵	14.4	3.6	3.4	15.0	56.4
Orthopedic impairments.....	2.9	1.2	1.5	2.9	14.6
Other causes.....	19.3	17.5	13.0	20.8	33.2

¹ Represents all illnesses disabling for 7 days or more and all hospital cases, confinements, and fatal cases. Based on National Health Survey data.

² 2,152,740 persons in white families.

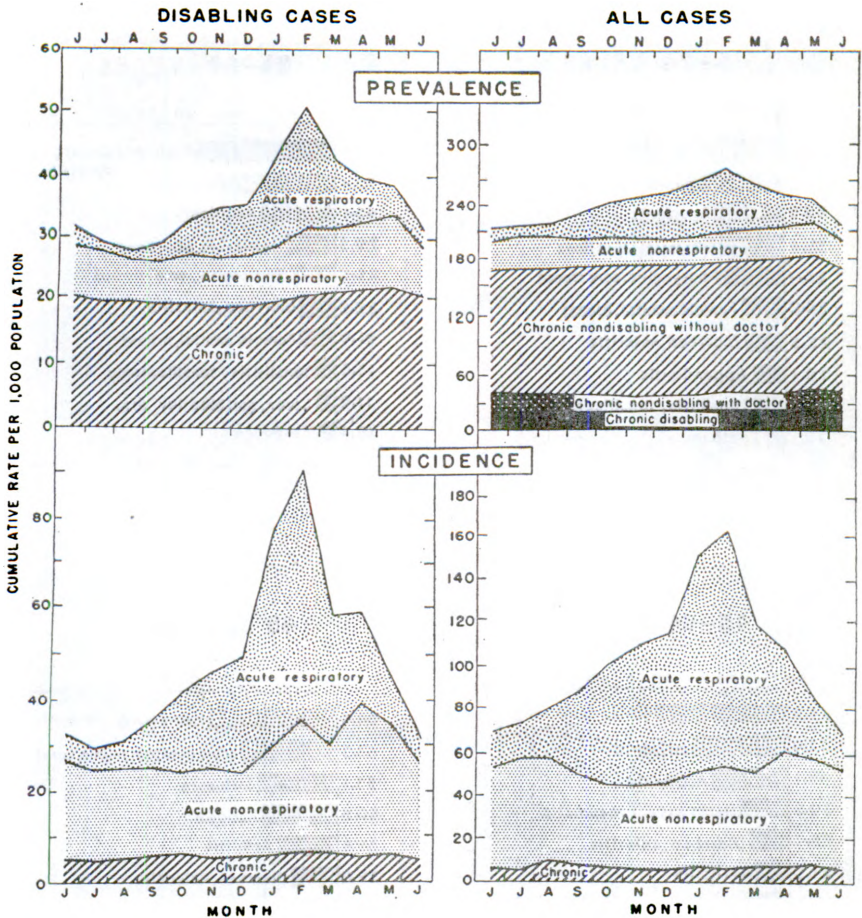
³ Represents influenza, coryza, bronchitis, pleurisy, sinusitis, asthma, hay fever, and other diseases of the respiratory system except pneumonia, tonsillitis, and respiratory tuberculosis.

⁴ Represents indigestion, biliousness, diarrhea and enteritis, ulcer of the stomach or duodenum, diseases of the gall bladder or liver, and other diseases of the digestive system.

⁵ Represents cancer; diabetes; cerebral hemorrhage and other forms of paralysis; diseases of the heart, arteriosclerosis, and high blood pressure; and other diseases of the circulatory system, exclusive of hemorrhoids and varicose veins; nephritis and other nonvenereal diseases of the genito-urinary system, exclusive of diseases of the female genital organs.

Source: Hollingsworth, Helen; Klem, Margaret C.; Baney, Anna Mae: Medical Care and Costs in Relation to Family Income, 2d ed. (Social Security Administration, Bureau of Research and Statistics Memorandum No. 51). Washington, Government Printing Office, 1947, p. 74.

Average seasonal variation in the prevalence and in the incidence of illness, classified according to broad cause groups, June 1938–May 1944¹



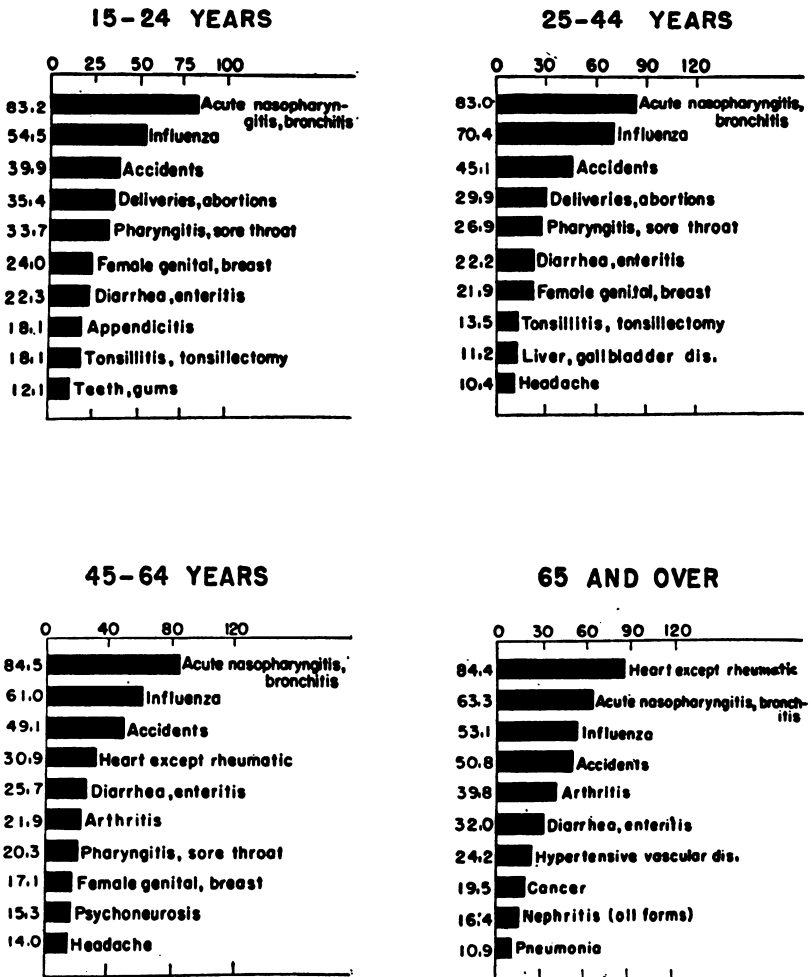
¹ Based on data recorded in monthly visits to the households of approximately 2,000 white families during a study of illness in the eastern health district of Baltimore, Md., made by the U. S. Public Health Service in cooperation with the Milbank Memorial Fund, the Johns Hopkins School of Hygiene and Public Health, and the city health department. Data represent the sole and primary causes only. Prevalence represents persons sick on the day of the visit per 1,000 population visited; in this figure the rate for each month is an average for that month of the 5 years of the study. Incidence represents the number of cases with onset during each month of the study period; in this figure the rate for each month is an average for that month of the 5 years of the study.

Source: Collins, Selwyn D.: "Sickness Surveys." *Administrative Medicine: Nelson Loose-Leaf Medicine* (Edited by Haven Emerson, M.D.), 7: 511-535, 1950. (In press.)

FIGURE 4.

The 10 most frequent causes of disabling illness among surveyed persons in each specified age group, 1938-43¹

ANNUAL INCIDENCE OF DISABLING CASES PER 1,000 PERSONS OBSERVED



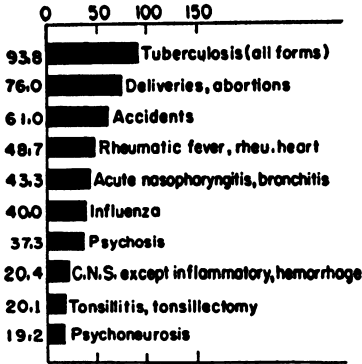
¹ Based on data recorded in monthly visits to the households of approximately 2,000 white families during a study of illness in the eastern health district of Baltimore, Md., made by the U. S. Public Health Service in cooperation with the Milbank Memorial Fund, the Johns Hopkins School of Hygiene and Public Health, and the city health department. Data represent the sole and primary causes of illness only. Information is based on full-time person-years of observation: 15 to 24, 4,035; 25 to 44, 7,032; 45 to 64, 4,439; 65 and over, 1,280. Scales are so arranged that bars for all causes for every group would be the same length for both measures of illness.

Source: Collins, Selwyn D.: "Sickness Surveys." Administrative Medicine: Nelson Loose-Leaf Medicine (Edited by Haven Emerson, M. D.), 7: 511-535, 1930. (In press.)

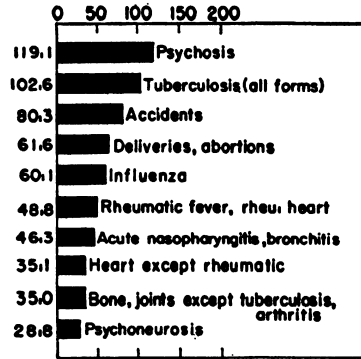
FIGURE 5.

ANNUAL DAYS DISABLED PER 100 PERSONS OBSERVED

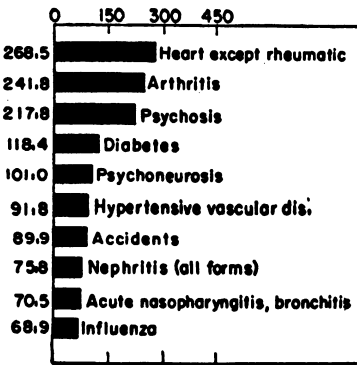
15-24 YEARS



25-44 YEARS



45-64 YEARS



65 AND OVER

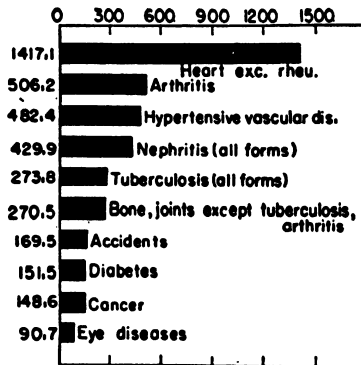


FIGURE 5—Continued.

Most Frequent Causes of Death

Table 43.—Distribution of deaths, of life years lost, and of working years lost, by leading causes of death, United States, for specified years 1930-45 ¹

Cause (by 1945 rank)	1930		1935		1940		1945	
	Number (in thousands)	Per cent	Number (in thousands)	Per cent	Number (in thousands)	Per cent	Number (in thousands)	Per cent
Distribution of deaths								
Total.....	1,327	100.0	1,393	100.0	1,417	100.0	1,402	100.0
1. Heart.....	251	18.9	312	22.4	385	27.2	424	30.3
2. Cancer.....	114	8.6	138	9.9	158	11.2	178	12.6
3. Cerebrovascular.....	104	7.9	109	7.8	120	8.4	129	9.2
4. Accidents.....	94	7.1	100	7.2	97	6.8	96	6.8
5. Nephritis.....	107	8.0	103	7.4	107	7.6	88	6.3
6. Pneumonia.....	120	9.1	133	9.5	93	6.5	68	4.9
7. Tuberculosis.....	84	6.3	70	5.1	60	4.3	53	3.8
All others.....	453	34.1	428	30.7	397	28.0	366	26.1
Distribution of life years lost ²								
Total.....	33,210	100.0	31,815	100.0	29,387	100.0	28,992	100.0
1. Heart.....	3,526	10.6	4,060	12.8	4,781	16.3	5,589	19.3
2. Accidents.....	2,873	8.7	2,877	9.0	2,740	9.3	2,804	9.7
3. Cancer.....	1,755	5.3	2,039	6.4	2,344	8.0	2,718	9.4
4. Pneumonia.....	3,780	11.4	3,895	12.2	2,584	8.8	2,058	7.1
5. Cerebrovascular.....	1,245	3.7	1,280	4.0	1,373	4.7	1,594	5.5
6. Tuberculosis.....	2,713	8.2	2,153	6.8	1,805	6.1	1,529	5.3
7. Nephritis.....	1,524	4.6	1,383	4.4	1,378	4.7	1,237	4.2
All others.....	15,790	47.5	14,128	44.4	12,382	42.1	11,463	39.5
Distribution of working years lost ³								
Total.....	19,090	100.0	17,652	100.0	15,283	100.0	13,913	100.0
1. Accidents.....	1,921	10.1	1,897	10.7	1,782	11.7	1,760	12.6
2. Heart.....	1,488	7.8	1,552	8.8	1,670	10.9	1,684	12.1
3. Pneumonia.....	2,242	11.7	2,309	13.1	1,442	9.4	1,123	8.1
4. Cancer ⁴	777	4.1	857	4.9	962	6.3	1,027	7.4
5. Tuberculosis ⁴	1,965	10.3	1,525	8.6	1,252	8.2	1,019	7.3
6. Nephritis ⁴	660	3.4	557	3.2	520	3.4	431	3.1
7. Cerebrovascular ⁴	413	2.2	411	2.3	414	2.7	414	3.0
All others.....	9,624	50.4	8,544	48.4	7,241	47.4	6,455	46.4

¹ Based on data published by the National Office of Vital Statistics and by the Bureau of the Census; excludes stillbirths, and deaths in the armed forces overseas. Highest percentage rates for each year have been italicized.

² Based on white male life expectancy values in each of the 4 years.

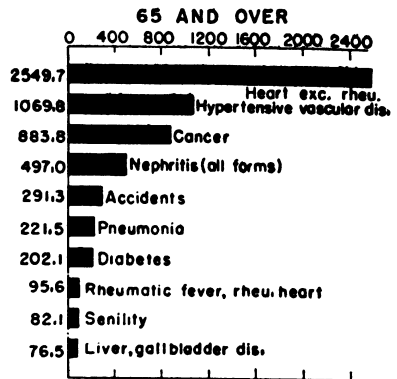
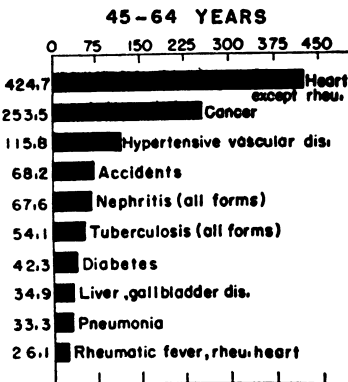
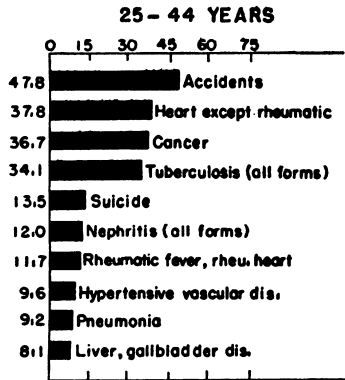
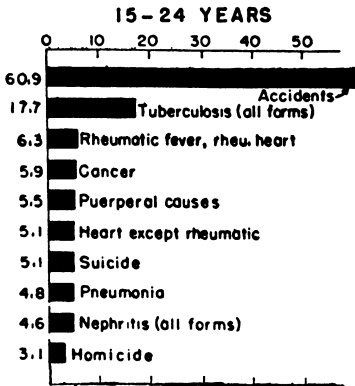
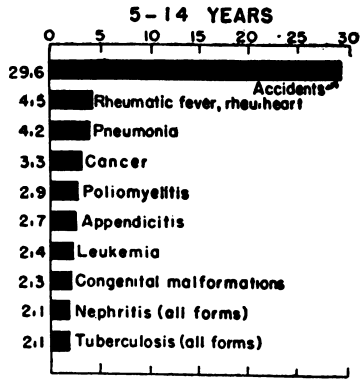
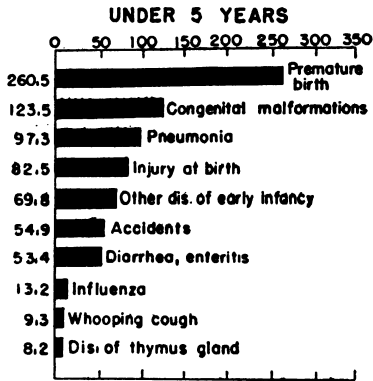
³ Based on white male working life expectancies in each of the 4 years.

⁴ The same rank was assigned to 2 causes of death when the percentages for the 2 causes differed only 0.1 percent.

Source: Dickinson, Frank G., and Welker, Everett L.: What is the Leading Cause of Death? (Bureau of Medical Economic Research, Bulletin No. 64). Chicago, American Medical Association, 1948, pp. 4-5.

The 10 most frequent causes of death among persons in each specified age group, United States 1945-46.¹

DEATH PER 100,000 PERSONS



¹ Computed from annual mortality reports of the National Office of Vital Statistics.

Source: Collins, Selwyn D.: "Sickness Surveys." Administrative Medicine: The Nelson Loose-Leaf Medicine (Edited by Haven Emerson, M. D.), 7: 511-535, 1950. (In press.)

FIGURE 6.

Absenteeism and Mortality Among Industrial Workers

Factors Relating to Absenteeism

With the estimate that in the United States as a whole between 400 million and 500 million days are lost from work annually because of disabilities of nonoccupational origin, the problem of illness in industry assumes major importance in the national industrial economy.

Many factors affect the extent of ill health in industry. In times of depression, for example, only those most fit for work are likely to be on the payroll. Employees are thus highly selected from a health standpoint. In times of expanding business activity there is increased employment of young and older workers and workers long unemployed or inexperienced. As a result, there is a general lowering of physical standards for employment.

Particular reference should be made to the increased employment of married women. While ordinarily the illness rate for females is higher than that for males, the influx of married women into industry has tended to increase the female rate still more because of pregnancy and mental and physical fatigue precipitated by change of job routine and domestic problems.

Many psychological factors have an important relationship to illness in industry. For example, it was recently stated that the lowest sickness absenteeism rates were found in plants where promotion is possible for efficient workers, and where there is stability but not rigidity of organization. Undoubtedly, adverse factors frequently include emotional strains caused by the nagging of a person in charge, the absence of reasonable consideration, a lack of authority over assistants, and personal mental conflicts.

In addition to those factors originating in the plant environment and the worker himself, a considerable number related to ill health is referable to the environment outside the plant, such as housing, living conditions, transportation facilities, nutrition, availability of prompt and efficient medical service, and community sanitary conditions.

Quoted from Gafafer, William M.: *Illness in Industry* (Health Practices Pamphlet No. 19). Chicago, National Safety Council, Inc., 1946, page 1.

As in all fields of public health, morbidity statistics are preferable to mortality statistics for knowledge of health problems and for use in the prevention of illness and death. Morbidity is used here meaning all illness resulting from disease or injury. . . . A practical method of obtaining morbidity statistics for the adult population employed in manufacturing plants is through the study of illnesses causing absence from work. The managers of many plants are concerned with the health problems of their workers as evidenced by the in-

auguration of measures for control of occupational diseases and injuries and the establishment of medical departments. Since reporting of cases of occupational disease and injury is required in many States and compensation is usually provided by law, progress is being made in this phase of the program. As the result of the reduction of industrial hazards and prevention of occupational illnesses and injuries, the causes of illness of these workers, that is respiratory and digestive diseases, are the same common causes of illness of persons in the general population. The relative size of illness rates from these causes in a specific industry would be of great value for plant managers and industrial health workers. Without satisfactory data for a relatively large group of industrial workers, there are no standards for comparison of the experience of a plant. How frequently should we expect workers to be sick? How can control programs be developed for prevention of illness and injury? Some progress has been made in the development of such statistical data.

Quoted from Puffer, Ruth R.: "Industrial and Occupational Environment and Health." *Backgrounds of Social Medicine*. New York, Milbank Memorial Fund, 1949, pages 129-130.

Unfortunately, in the United States no statistics of a Nation-wide character are available on the prevalence of occupational diseases, since reporting is mandatory only in 26 States. Furthermore, it is difficult to have physicians report occupational diseases. Many physicians seldom treat diseases of occupation and therefore may often not recognize them as such. Even in States such as Connecticut where physicians are paid for each report of an occupational disease, the reporting is not satisfactory.

In those States in which the report of a physician attached to a factory can be used by the worker in a compensation suit, the situation is almost hopeless. Even when the report of a physician cannot be used in litigation, a fair degree of success can be anticipated only when close contact is maintained between each physician and the agency to which occupational disease reports are sent.

Information on such reports was collected from 18 States for the 1948 fiscal year (July 1, 1947, to June 30, 1948). It was revealed that about one-half of the 31,400 cases were from dermatitis. However, because of differences in the classifying of such diseases, it is difficult to draw any conclusions from these data on the occurrence of specific industrial diseases. Only 5 percent of the cases listed in the data represented reports made to departments of health. The remaining 95 percent consisted of either claims submitted for compensation or morbidity reports made to compensation agencies and referred to the industrial-hygiene divisions in the 18 States submitting data. It is known that occupational diseases account for a general average of about 2 percent of total disabilities arising from industrial causes.

Quoted from Bloomfield, J. J.: *Industrial Hygiene: A Series of Lectures on Principles and Practices*, Washington, United States Public Health Service, Division of Industrial Hygiene, 1950, pages 11-12.

Sick-Absenteeism Among Women Employees

Women are ill more frequently and lose more time from work because of sickness than men, but their absences are shorter. The number of cases of sickness, causing one or more days of lost time, varies with many conditions. In the few studies which have been published, rates from 900 to 3,000 absences per 1,000 women per year were reported, the most extensive study indicating a frequency of about 1,800 cases. These rates among women were from 50 to 140 percent greater than in men. The average number of days lost per year due to sickness alone has been reported to be from 7 to 11 days per woman in comparison with 2 to 7 days per man, an excess of 50 to 100 percent. The average duration per illness is, however, greater for men, being about 8 days as compared with 6 days for women. The difference in the incidence of illness reported by the various studies reflects the many difficulties and inaccuracies in the collection of such data and the need for further investigation. An extensive survey of the more serious illnesses, causing absences lasting 8 days or longer, showed that the annual number of such cases per 1,000 employees was 142 for women as compared with 85 for men. Studies made in the general population and in the Women's Army Corps entirely supported the findings from industry in regard to the greater incidence of illness among women as compared with men.

The chief causes of sick-absenteeism were respiratory diseases, which accounted for about 50 percent of both the number of cases and the annual number of days lost, and digestive diseases, which were responsible for almost 20 percent of the cases. The female rate exceeded the male rate for the three broad groups, respiratory, digestive and nonrespiratory-nondigestive causes of illness, indicating that the excess illness was due to diseases common to both men and women. Both acute and chronic diseases were more prevalent in women.

The reason for the excess sick-absenteeism among women as compared with men is not entirely clear. It would not seem to be due to a difference in sex susceptibility to disease, since the mortality rate for males exceeds that for females at all ages. Furthermore, some studies indicated that college men and women living under similar conditions showed no difference in their illness rates. Also the excess rate is not limited to those diseases which are associated with the sex functions of women, but occurs for diseases common to both sexes.

The excess frequency rate may be due merely to the fact that women take their minor illnesses more seriously than men. This is supported by the fact that the average duration of sick-absences is shorter for women than men. Many persons believe that the excess sick-absenteeism among industrial women is due to the fact that they frequently attempt to do two jobs at once, their work in industry plus their duties at home, which may demand heavy labor, worry, and interference with proper rest. Part of the excess absenteeism among

women may be due to a less serious attitude toward their work, so that they take time off for minor ailments or report unjustified absences as due to sickness more frequently than men. There is some evidence that women may have a higher incidence of nervous and mental diseases than men, but how far a lack of emotional adjustment is responsible for the excess illness is not known. Some people have attributed the excess sick-absenteeism to poorer nutritional habits on the part of women, but there is little factual evidence to support this assumption at present.

Quoted from Beetjer, Anna M.: *Women in Industry*. Philadelphia, W. B. Saunders Co., 1946, pages 230-253.

Number and Duration of Absences

Table 44.—Absences lasting 1 day or longer due to sickness and nonindustrial injuries, days of disability per person and average number of days per absence, by sex, age, and year in which absence ended, 1940-44¹

Year in which absence ended	Males						
	All ages ²		Age group				
	Crude	Standardized ³	Under 25	25-34	35-44	45-54	55 and over
	Number of persons-year of exposure ⁴						
1940-44.....	12, 116		608	2, 641	3, 906	3, 096	1, 865
1940.....	2, 706		154	752	828	623	349
1941.....	2, 702		157	697	843	648	357
1942.....	2, 483		157	576	792	603	355
1943.....	2, 147		88	361	726	590	382
1944.....	2, 078		53	255	717	632	422
	Average annual number of absences per 1,000 persons						
1940-44.....	1, 132. 4	1, 181. 8	1, 426. 0	1, 212. 8	1, 117. 8	1, 053. 0	1, 083. 6
1940.....	858. 8	902. 5	1, 116. 9	930. 9	783. 8	786. 5	896. 8
1941.....	896. 4	957. 4	1, 261. 1	929. 7	858. 3	788. 6	958. 0
1942.....	1, 075. 7	1, 130. 3	1, 407. 6	1, 171. 9	984. 8	1, 018. 2	1, 064. 8
1943.....	1, 421. 1	1, 490. 7	1, 727. 3	1, 709. 1	1, 605. 5	1, 255. 9	1, 172. 8
1944.....	1, 565. 0	1, 795. 9	2, 384. 6	2, 207. 8	1, 563. 5	1, 430. 4	1, 279. 6
	Average annual number of days per persons						
1940-44.....	10. 163	9. 854	6. 393	6. 860	8. 769	10. 405	18. 498
1940.....	8. 055	8. 440	7. 188	6. 382	7. 088	7. 538	15. 268
1941.....	8. 624	8. 819	5. 866	5. 548	7. 658	8. 262	18. 549
1942.....	9. 896	9. 571	5. 096	7. 653	8. 053	10. 756	17. 845
1943.....	11. 394	10. 564	7. 182	7. 454	9. 574	13. 071	16. 958
1944.....	13. 995	12. 648	8. 212	9. 224	11. 989	12. 603	23. 083
	Average number of days per absence						
1940-44.....	8. 98	8. 34	4. 48	5. 66	7. 85	9. 88	17. 07
1940.....	9. 38	9. 35	6. 44	6. 86	9. 04	9. 58	17. 01
1941.....	9. 62	9. 21	4. 65	5. 97	8. 95	10. 48	19. 36
1942.....	9. 17	8. 47	3. 62	6. 53	8. 18	10. 56	16. 76
1943.....	8. 02	7. 08	4. 16	4. 36	6. 36	10. 41	14. 46
1944.....	8. 94	7. 04	3. 44	4. 18	7. 67	8. 81	18. 04

Footnotes at end of table, p. 100.

Table 44.—Absences lasting 1 day or longer due to sickness and nonindustrial injuries, days of disability per person and average number of days per absence, by sex, age, and year in which absence ended, 1940-44¹—Con.

Year in which absence ended	Females						
	All ages ²		Age group				
	Crude	Standardized ³	Under 25	25-34	35-44	45-54	55 and over
	Number of person-years of exposure ⁴						
1940-44.....	2,771	-----	542	705	816	498	210
1940.....	584	-----	79	193	181	88	43
1941.....	572	-----	78	171	184	95	44
1942.....	533	-----	78	143	174	99	39
1943.....	548	-----	146	110	141	108	43
1944.....	534	-----	161	88	136	108	41
	Average annual number of absences per 1,000 persons						
1940-44.....	2,136.8	2,354.3	3,328.4	1,974.5	1,802.7	1,718.9	1,890.5
1940.....	1,679.8	1,698.6	1,696.2	1,834.2	1,486.2	1,556.8	2,023.3
1941.....	1,597.9	1,549.3	1,423.1	1,795.3	1,619.6	1,452.6	1,363.6
1942.....	1,763.6	2,102.4	3,205.1	1,678.3	1,402.3	1,404.0	1,692.3
1943.....	2,717.2	2,850.5	4,123.3	2,281.8	2,646.1	1,842.6	1,814.0
1944.....	2,990.6	3,109.2	4,391.3	2,727.3	2,213.2	2,250.0	2,585.4
	Average annual number of days per person						
1940-44.....	12.710	12.621	11.120	10.399	11.130	16.685	21.105
1940.....	10.608	10.699	8.684	9.974	8.149	13.636	21.140
1941.....	12.486	11.297	5.872	12.064	12.315	14.168	22.932
1942.....	11.844	12.196	12.936	9.727	9.213	17.091	14.872
1943.....	13.294	13.142	12.808	9.182	16.149	11.083	21.651
1944.....	15.513	14.749	12.447	10.705	10.743	26.611	24.463
	Average number of days per absence						
1940-44.....	5.95	5.36	3.34	5.27	6.17	9.71	11.16
1940.....	6.31	6.30	5.12	5.44	5.48	8.76	10.45
1941.....	7.81	7.29	4.13	6.72	7.60	9.75	16.82
1942.....	6.72	5.80	4.04	5.80	6.57	12.17	8.79
1943.....	4.89	4.61	3.11	4.02	6.34	6.02	11.94
1944.....	5.19	4.74	2.83	3.92	4.85	11.83	9.46

¹ Based on experience of a public utility company, 1940-44, inclusive. The number of days of disability is the number of calendar days from the date absence began to the date absence ended, or to the 372d day, inclusive.

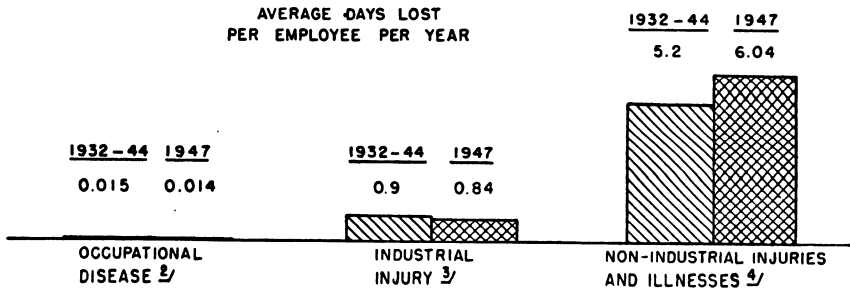
² Includes a negligible number of absent persons of unknown age.

³ Age-standardized according to estimates of male and female employment in the United States for the week ending June 13, 1942.

⁴ The age distributions applied to the total number of person-years of exposure for the years 1940-43 are as of Jan. 1 of each year; for the year 1944 the distribution is as of Dec. 1, 1943.

Source: Gafaer, William M., and Sitgreaves, Rosedith: "The Age Factor in Disabling Morbidity, 1940-44; Experience in a Public Utility Company." Public Health Reports, 60: 1447-1462 (Dec. 7) 1945.

Absenteeism from injury and illness in industry, 1932-44 and 1947¹



¹ Based on studies by the American College of Surgeons of diversified manufacturing companies in various parts of the United States and Canada.

² Data for 1932-44 are based on 488 companies employing 1.4 million persons; for 1947, on 381 companies employing 1.4 million persons.

³ Data for 1932-44 are based on 760 companies employing 3.6 million persons; for 1947, on 381 companies employing 1.4 million persons.

⁴ Data for 1932-44 are based on 285 companies employing 1 million persons; for 1947, on 214 companies employing 0.9 million persons. Since in some instances companies did not make it a practice to record non-industrial absences of less than 7 days' duration, the average length of time lost per year from nonindustrial causes was probably somewhat higher.

Source: Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, pp. 54-55; and Hess, Gaylord R.: "Analysis of Experience of Industry in the Medical Care of Employees—A Compilation." *Bulletin, American College of Surgeons*, 33: 163-169 (September) 1948.

FIGURE 7:

Table 45.—Distribution of sick absences lasting 1 day or longer, by duration of absence and sex of employee¹

Duration of absence (in calendar days)	Absences from all sickness ²			
	Males ³		Females ³	
	Number per 1,000	Percent of total	Number per 1,000	Percent of total
All durations.....	854.5	100.0	1,765.8	100.0
1.....	211.1	24.7	689.0	33.3
2.....	128.4	15.0	321.5	18.2
3.....	141.0	16.5	275.6	15.6
4.....	81.0	9.5	136.2	7.7
5.....	57.6	6.7	98.8	5.6
6.....	52.3	6.1	76.4	4.3
7.....	54.9	6.4	73.2	4.1
8 to 14.....	56.0	6.5	91.9	5.2
15 to 28.....	28.0	3.3	39.4	2.2
29 to 49.....	19.8	2.3	30.9	1.7
50 to 98.....	15.8	1.8	21.5	1.2
99 to 189.....	4.7	.6	8.2	.5
190 to 371.....	2.2	.3	2.4	.1
372.....	1.7	.2	.8	.04

¹ Based on experience of a public utility company 1933-41 inclusive. The number of days of disability is the number of calendar days from the date disability began to the date of return to work, or to the 372d day inclusive.

² Occupational and nonoccupational injuries excluded.

³ Number of person years of exposure: males, 10,926; females, 2,460.

Source: Baetjer, Anna M.: *Women in Industry*, 1946, p. 49; and Gafafer, William M.: "Absenteeism." *Manual of Industrial Hygiene*, 1943, p. 436. (Both publications: Philadelphia, W. B. Saunders Co.)

Table 46.—Absences lasting 1 day or longer due to sickness, days of disability per person, and average number of days per absence, by age group and sex of employee ¹

Age group	Annual number of absences per 1,000 persons			Annual number of days of disability per person			Average number of days per absence	
	Male	Female	Percent excess	Male	Female	Percent excess	Male	Female
15 to 24.....	1, 120	2, 499	123	5.35	12.77	139	4.78	5.11
25 to 34.....	1, 085	2, 461	127	5.68	14.06	162	5.14	5.71
35 to 44.....	1, 015	1, 730	70	7.04	11.51	63	6.94	6.65
45 to 54.....	963	1, 247	29	7.06	13.22	87	7.33	10.60
55 and over.....	852	1, 273	49	11.39	16.32	43	13.37	12.82

¹ Based on experience of a public utility company, 1922-24.

Source: Baetjer, Anna M.: *Women in Industry*. Philadelphia, W. B. Saunders Co., 1946, p. 54.

Table 47.—Distribution of absentee cases and days lost per employee, by length of absence and sex of employee, 1943; data reported by the medical department of a large insurance company

Length of absence	Average number of cases per employee				Average number of days lost per employee			
	Males		Females		Males		Females	
	Rate	Percent of total	Rate	Percent of total	Rate	Percent of total	Rate	Percent of total
1 day to 1 year, total.....	2.00	100.0	3.09	100.0	7.27	100.0	10.48	100.0
1 day.....	.96	49.0	1.62	52.4	.96	13.5	1.62	15.5
2 days.....	.42	21.0	.57	18.5	.83	11.4	1.14	10.9
3 to 5 days.....	.42	21.0	.60	19.4	1.53	21.0	2.23	21.3
6 to 25 days.....	.14	7.0	.24	7.8	1.62	20.9	2.53	24.1
26 days to 1 year.....	.04	2.0	.06	1.9	2.41	33.2	2.96	28.2

Source: Baetjer, Anna M.: *Women in Industry*. Philadelphia, W. B. Saunders Co., 1946, p. 51.

Absences by Cause

Table 48.—Absences lasting 1 day or longer due to sickness and injuries, days of disability per person and average number of days per absence, by cause of absence and sex of employee ¹

Cause of absence	Annual number of absences per 1,000 persons		Annual number of days per person		Average number of days per absence	
	Males	Females	Males	Females	Males	Females
All disabilities.....	919.7	1,851.2	8,234	11,911	8.95	6.43
Industrial injuries.....	22.4	4.5	.678	.039	30.23	8.73
Nonindustrial injuries.....	42.8	80.9	.464	1.211	10.85	14.97
Sickness.....	854.5	1,765.8	7,092	10,661	8.30	6.04
Respiratory diseases.....	541.7	947.1	2,936	4,520	5.42	4.77
Digestive diseases.....	153.7	324.4	1,182	1,513	7.69	4.66
Nonrespiratory-nondigestive diseases.....	135.1	354.6	2,857	3,939	21.15	10.80
Ill-defined and unknown causes.....	24.0	129.7	.117	.689	4.88	5.31

¹ Based on experience of a public utility company 1938-41, inclusive. The number of days of disability is the number of calendar days from the date disability began to the date of return to work, or to the 372d day, inclusive. The number of person-years of exposure: males 10,926; females, 2,460.

Source: Gafaer, William M.: "Absenteeism." *Manual of Industrial Hygiene*. Philadelphia, W. B. Saunders Co., 1943, p. 427.

Table 49.—Frequency of absences lasting 1 calendar day or longer due to sickness and injuries, by duration of illness and sex of employee ¹

Duration of absence (in calendar days) ²	All disabilities	Industrial injuries	Nonindustrial injuries	Sickness			
				Total	Respiratory diseases	Digestive diseases	Nonrespiratory, non-digestive diseases ³
Annual number of absences per 1,000 males ⁴							
All durations.....	919.7	22.4	42.8	854.5	541.7	153.7	159.1
1.....	222.8	2.7	9.0	211.1	120.7	58.4	32.0
2.....	133.3	1.1	3.8	128.4	86.3	23.4	19.7
3.....	147.3	1.5	4.8	141.0	96.8	24.4	19.8
4.....	85.8	1.4	3.4	81.0	57.9	11.0	12.1
5.....	60.5	.5	2.4	57.6	41.9	7.4	8.3
6.....	56.0	1.3	2.4	52.3	39.2	4.2	8.9
7.....	60.0	1.1	4.0	54.9	39.4	4.7	10.8
8 to 14.....	65.7	3.4	6.3	56.0	38.1	4.7	13.2
15 to 28.....	33.0	2.1	2.9	28.0	12.7	3.7	11.6
29 to 49.....	24.2	2.7	1.7	19.8	5.3	5.5	9.0
50 to 98.....	20.6	3.1	1.7	15.8	3.0	5.5	7.3
99 to 189.....	6.8	1.2	.4	4.7	.7	.6	3.4
190 to 371.....	2.3	.1	-----	2.2	.4	.1	1.7
372.....	1.9	.2	-----	1.7	.3	.1	1.3
Annual number of absences per 1,000 females ⁴							
All durations.....	1,851.2	4.5	80.9	1,765.8	947.1	324.4	494.3
1.....	608.5	.4	19.1	589.0	246.3	143.1	199.6
2.....	331.7	.4	9.8	321.5	190.6	59.0	71.9
3.....	287.0	-----	11.4	275.6	154.9	51.2	69.5
4.....	141.5	.4	4.9	136.2	88.2	19.1	28.9
5.....	102.0	.4	2.8	98.8	69.5	11.4	17.9
6.....	81.7	.9	4.4	76.4	50.9	9.7	15.8
7.....	78.1	.4	4.5	73.2	50.4	4.5	18.3
8 to 14.....	101.2	1.2	8.1	91.9	61.4	9.8	21.2
15 to 28.....	45.9	-----	6.5	39.4	17.0	3.7	18.7
29 to 49.....	36.2	.4	4.9	30.9	9.8	8.1	13.0
50 to 98.....	24.0	-----	2.5	21.5	5.6	5.3	10.6
99 to 189.....	9.4	-----	1.2	8.2	2.5	-----	5.7
190 to 371.....	2.4	-----	-----	2.4	-----	-----	2.4
372.....	1.6	-----	.8	.8	-----	-----	.8

¹ Based on experience of a public utility company, 1933-41, inclusive.

² Number of calendar days from the date disability began to the date of return to work, or to the 372d day, inclusive.

³ Ill-defined and unknown causes included.

⁴ Number of person-years of exposure: males, 10,926; females, 2,460.

Source: Gafafer, William M.: "Absenteeism." Manual of Industrial Hygiene, Philadelphia, W. B. Saunders Co., 1943, p. 436.

Table 50.—Average number of absences among employees in various industries on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by sex and cause, 1948, 1947, and 1939-48 inclusive ¹

Cause of absence	Males			Females		
	1948	1939-48 ²	1947	1948	1939-48 ²	1947
Average number of persons employed (in thousands)...	218.4	2,405.8	216.5	20.7	217.7	21.0
	Average number of absences per 1,000 persons					
Sickness and nonindustrial injuries (total).....	104.5	115.0	111.9	257.2	208.4	260.4
<i>Percent of female rate</i>	41	56	43			
<i>Percent of male rate</i>				248	181	235
Nonindustrial injuries.....	12.1	11.9	11.7	19.7	15.2	18.2
Sickness.....	92.4	103.1	100.2	237.5	193.2	242.2
Respiratory diseases.....	32.4	44.3	38.6	104.5	86.1	107.2
Digestive diseases.....	17.4	16.9	17.5	31.1	29.0	33.4
Nonrespiratory-nondigestive diseases.....	39.7	38.5	40.6	97.0	73.2	96.9
Ill-defined and unknown causes.....	2.9	3.4	3.5	4.9	4.8	4.7

¹ Based on data compiled by the Division of Industrial Hygiene, U. S. Public Health Service. Industrial injuries and venereal diseases are not included in above tabulation.

² Average of 10 annual rates.

Source: Gafafer, William M.: "Industrial Sickness Absenteeism, Males and Females, 1948, and Males, First and Second Quarters, 1949." Public Health Reports, 64: 1250-1252 (Oct. 28) 1949.

Table 51.—Annual incidence of cases of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer beginning during 1948 and 1947, by sex and cause; experience of 5 companies reporting both years to Industrial Hygiene Foundation compared with companies reporting to Public Health Service ¹

Cause	Males				Females			
	Industrial Hygiene Foundation		Public Health Service		Industrial Hygiene Foundation		Public Health Service	
	1948	1947	1948	1947	1948	1947	1948	1947
Average number of employees.....	21,959	22,972	218,419	216,471	3,101	3,289	20,728	21,021
	Annual number of cases per 1,000 employees							
Sickness and nonindustrial injuries, total ²	96.1	116.9	104.5	111.9	82.2	91.2	257.2	260.4
<i>Percent of female rate</i>	117	128	41	43				
<i>Percent of male rate</i>					86	78	248	235
Nonindustrial injuries.....	12.0	13.0	12.1	11.7	8.4	8.5	19.7	18.2
Sickness.....	84.1	103.9	92.4	100.2	73.8	82.7	237.5	242.2
Respiratory diseases.....	32.9	48.2	32.4	38.6	30.6	35.0	104.5	107.2
Digestive diseases.....	16.8	18.2	17.4	17.5	17.4	16.1	31.1	33.4
Nonrespiratory-nondigestive diseases.....	32.9	35.7	39.7	40.6	25.2	30.7	97.0	96.9
Ill-defined and unknown causes.....	1.5	1.8	2.9	3.5	2.6	2.9	4.9	4.7

¹ Based on a study of absenteeism in industry cooperatively undertaken by the 2 agencies in 1940.

² Industrial injuries and venereal diseases are not included in above tabulation.

³ Rate is based on less than 5 cases.

Source: Gafafer, William M.: "Sick Absenteeism Among a Sample of Member Companies of I-H-F." Developing Human Resources (Transactions Bulletin No. 11). Pittsburgh, Industrial Hygiene Foundation, 1949, p. 80.

Table 52.—Annual incidence, by company, of cases of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, beginning during 1948 and 1947, by sex and broad cause group; experience of 5 companies reporting both years to Industrial Hygiene Foundation as compared with rates reported by Public Health Service 1

Company letter	Annual number of cases per 1,000 employees										
	Average number of employees		Total sickness and nonindustrial injuries ¹		Nonindustrial injuries		Sickness			Nonrespiratory, noninfective diseases ²	
	1948	1947	1948	1947	1948	1947	1948	1947	1948		1947
MALES											
Public Health Service.....	218,419	216,471	104.5	111.9	12.1	11.7	32.4	38.6	17.4	42.6	44.1
Industrial Hygiene Foundation, 5 companies.....	21,959	22,972	96.1	110.9	12.0	13.0	32.7	48.2	16.8	34.4	37.5
E.....	5,849	7,078	53.3	111.0	8.6	10.2	33.7	55.2	15.2	25.8	26.3
A.....	5,742	5,892	98.2	113.7	12.9	13.6	31.4	37.1	19.8	33.8	30.4
F.....	6,042	5,847	98.8	120.2	14.7	15.6	32.3	48.0	13.1	38.7	43.8
H.....	1,746	1,724	99.7	138.6	9.2	13.3	28.1	58.1	16.6	45.8	62.2
B.....	2,580	2,431	112.0	116.8	13.2	8.6	38.7	50.2	22.5	37.6	38.5
FEMALES											
Public Health Service.....	20,728	21,021	287.2	260.4	19.7	18.2	104.5	107.2	31.1	101.9	101.6
Industrial Hygiene Foundation, 5 companies.....	3,101	3,289	82.2	91.2	8.4	8.5	30.6	35.0	17.4	28.8	31.0
E.....	1,596	1,794	49.5	64.9	6.3	3.3	18.2	25.8	10.0	15.0	18.5
A.....	4	12	260.0	183.3	0	0	0	0	0	420.0	0
F.....	776	778	113.4	137.5	12.9	21.8	38.7	43.7	20.6	31.2	51.4
H.....	95	106	116.8	113.2	0	9.4	42.1	42.3	10.5	53.2	56.0
B.....	630	609	120.6	134.6	9.5	46.6	50.8	52.5	35.3	27.0	41.0

¹ Based on a study of absenteeism in industry cooperatively undertaken by the Industrial Hygiene Foundation and the Public Health Service in 1940.

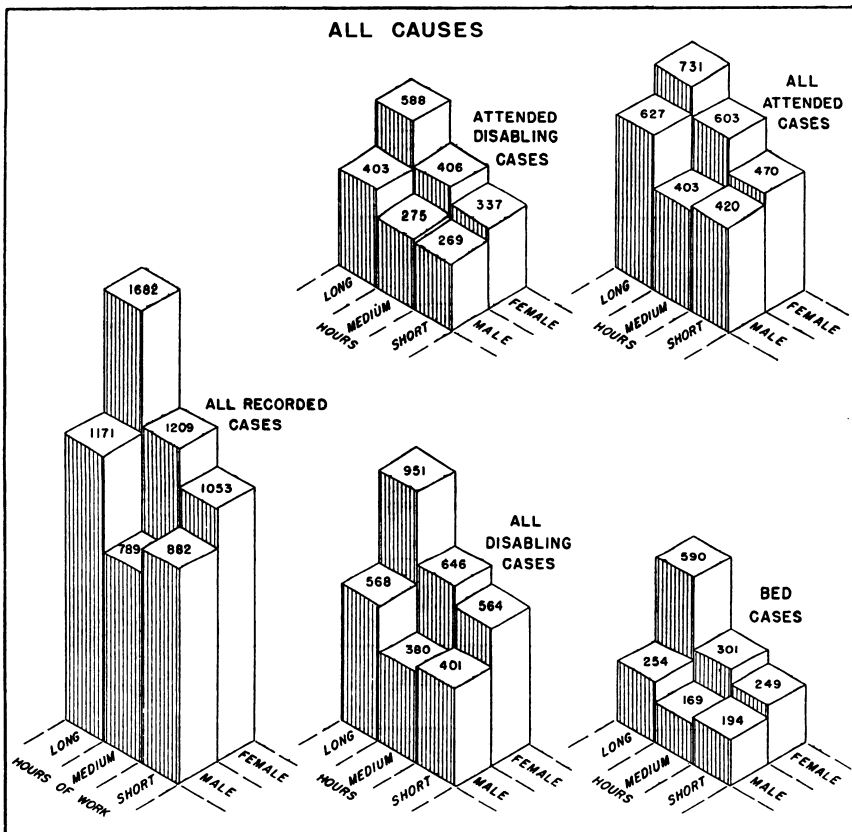
² Industrial injuries and venereal diseases are not included.

³ Ill-defined and unknown causes are included.

⁴ Rate is based on less than 5 cases.

Source: Galster, William M.: "Sick Absenteeism Among a Sample of Member Companies of I.-H.-F.," Developing Human Resources (Transactions Bulletin No. 11), Pittsburgh, Industrial Hygiene Foundation, 1949, p. 82.

Sickness among industrial workers in Baltimore. Annual illnesses of various types, from all causes, per 1,000 workers, classified according to specified hours of work, Eastern Health District, January 1941-May 1943 inclusive ¹



¹ Based on a combined U. S. Public Health Service and Milbank Memorial Fund survey. Data were compiled during monthly visits to the families of workers included in the study. Hours of work per week were defined as long—50 or more, medium—44 to 49, short—24 to 43. Population (years of life) were as follows: Male, long hours—503.7, medium—911.7, short—874.4; female, long hours—72.5, medium—414.3, short—457.4. Recorded cases included nondisabling and disabling illnesses. Disabling illnesses were those which caused 1 or more days loss from work; bed cases were disabling illnesses which confined the patient to bed for 1 or more days. Attended cases included attendance by a physician, clinic, hospital or other practitioner.

Source: Collins, Selwyn D. "Sickness Among Industrial Employees in Baltimore in Relation to Weekly Hours of Work, 1941-43." *The Milbank Memorial Fund Quarterly*, 26: 398-429 (October) 1948.

FIGURE 8

Table 53.—Absences lasting 1 day or longer due to illness and injury and days of disability per person, by cause of absence and sex of employee; experience of a public utility company 1938-41 and of Tennessee plants, 1944-47¹

Cause of absence	Annual number of absences per 1,000 persons				Annual number of days of disability per person			
	Public utility 1938-41		Tennessee plants 1944-47		Public utility 1938-41		Tennessee plants 1944-47	
	Males	Females	Males	Females	Males	Females	Males	Females
All disabilities.....	919.7	1,851.2	1,413.3	2,429.7	8.23	11.91	7.72	12.79
Injuries, total.....	65.3	85.4	97.3	94.6	1.14	1.25	.81	.60
Industrial.....	22.4	4.5	29.1	15.8	.68	.04	.30	.14
Nonindustrial.....	42.8	80.9	68.2	78.8	.46	1.21	.51	.36
Illness, total.....	854.5	1,765.8	1,316.0	2,335.1	7.09	10.66	6.91	12.29
Infectious and parasitic diseases.....	10.1	8.1	22.5	28.8	.33	.17	.29	.61
Diseases of eyes and ears.....	12.2	20.7	17.6	32.2	.12	.15	.09	.13
Diseases of nervous system.....	20.2	26.1	9.2	20.6	.52	.55	.14	.26
Diseases of circulatory system.....	19.1	23.2	17.8	15.9	.79	.57	.25	.41
Diseases of respiratory system.....	540.7	946.3	635.7	957.6	2.77	4.42	2.98	4.27
Influenza.....	148.6	169.5	99.7	123.8	1.01	1.10	.73	.99
Other respiratory diseases.....	392.1	776.8	536.0	833.8	1.76	3.32	2.25	3.27
Diseases of digestive system.....	153.7	324.4	227.6	362.3	1.18	1.51	1.23	1.91
Infected and impacted teeth.....	17.0	37.8	32.2	67.8	.05	.13	.14	.22
Other digestive diseases.....	136.6	286.6	195.4	294.5	1.13	1.39	1.08	1.69
Diseases of genito-urinary system.....	11.3	147.2	12.6	338.0	.36	.79	.17	1.64
Dysmenorrhea.....		123.6		284.5		.29		.67
Other of genito-urinary system.....	11.3	23.6	12.6	53.5	.36	.49	.17	.96
Diseases of skin.....	13.4	21.5	30.6	25.8	.15	.24	.26	.18
All other diseases.....	49.9	88.6	14.4	31.7	.76	1.57	.24	.74
Ill-defined and unknown causes.....	24.0	129.7	327.8	522.1	.12	.69	1.27	2.24

¹ Data for public utility company based on information compiled by the Division of Industrial Hygiene, U. S. Public Health Service; number of person-years of exposure covered by study, 10,926 males and 2,460 females. Data regarding Tennessee plants are based on the experience of 6 plants participating in a study of industrial health problems in Tennessee for a period of 1 year or longer during a 4-year period; number of white males, 10,316 and white females, 6,972.

Source: Puffer, Ruth R.: "Industrial and Occupational Environment and Health." Backgrounds of Social Medicine. New York, Milbank Memorial Fund, 1949, pp. 132-133; and Gafaer, William M.: "Absenteeism." Manual of Industrial Hygiene. Philadelphia, W. B. Saunders Co., 1943, p. 427.

Mortality in Occupational Groups

The vitality of American wage earners increased progressively during the period 1911-39, according to the latest analysis of occupational mortality among industrial policyholders made by the Metropolitan Life Insurance Co. The death rate among them declined sharply and their expectation of life was measurably lengthened. Moreover, diseases which three decades ago took a heavy toll among workers in the prime of life have, in many instances, been brought under control. The fall in the death rate from tuberculosis offers an outstanding example. Noteworthy also were the large reductions in the death rates from pneumonia and accidents.

Notwithstanding the considerable gains made, industrial policyholders continued to have a higher mortality and shorter longevity than did other workers. These differences suggest the effects of specific occupations, although other factors, both social and economic, also play an important part. The death rate for wage earners in the United States, as represented by these industrial policyholders, how-

ever, declined more rapidly than that of other employed persons during the period measured, and the gap between the two groups was gradually closing. . . . Over the entire period 1911-39 the death rates of the adult male industrial policyholders of the Metropolitan Life Insurance Co. showed a downward trend. . . . Because of this lowered mortality, the average life expectancy of an insured white male wage earner at age 20 rose $3\frac{1}{2}$ years (from 42.1 to 45.7 years) during the period 1923 to 1939, and from 1912 to 1939 it rose 9 years.

In 1938, the causes of death showing the highest rates for the group 15 years of age and over were organic diseases of the heart (214.1 deaths per 100,000), cancer (128.9), and accidental or unspecified violence (94.6). These were followed in order by chronic nephritis, tuberculosis of the respiratory system, and influenza and pneumonia combined, with rates of about 65 per 100,000. In 1912, on the other hand, tuberculosis of the respiratory system, fifth in importance in 1938, led with a rate of 319.9. Organic diseases of the heart (203.9), was second in 1912, followed in order by chronic nephritis (164.9), and accidental or unspecified violence (140.6). Two other causes in that year each had death rates of more than 100 per 100,000: Influenza and pneumonia combined, and cerebral hemorrhage, paralysis, etc. Cancer, second in importance in 1938, was seventh in 1912. A striking change had taken place, which reflects the extraordinary advances in the fields of preventive medicine and public health in the intervening period. . . . In spite of the marked reduction in death rates, the group of adult males studied still had a higher mortality and a shorter life span than did other population groups having fewer wage earners.

Quoted from Dublin, Louis I., and Vane, Robert J.: "Occupational Mortality Experience of Insured Wage Earners." *Monthly Labor Review*, 64: 1003-1006 (June) 1947.

No comprehensive analysis of occupational mortality has been made in the United States comparable to those of the Registrar General's study in England and Wales and of the Dominion Bureau of Statistics in Canada, both of which show that the mortality rates of workers in different industries vary widely. The only American study available is based on the mortality statistics of 1930 and the significance of its data should be appraised in terms of the fact that conditions of work in some industries, as well as the efficacy and availability of medical care, have changed in the interim. This study of death rates in 10 States in 1930 showed that the mortality rate of males 15 to 65 years old in the skilled labor group was 13.1 per 1,000 as compared to 7.0 per 1,000 in the professional group, a difference of 87 percent. The relation of occupation to death rates varied for different diseases. The causes of death which showed the closest correlation with occupational status were pulmonary tuberculosis, pneumonia, and accidents. The death rate for pulmonary tuberculosis among unskilled workers was seven times, and that for skilled workers nearly three times, the rate for professional men, while the rate for pneumonia for unskilled

workers was almost four times that for professional, and for skilled workers 30 percent more. A positive statistical correlation was also found in the case of nephritis, cancer, and diseases of the heart. The proportionate mortality in 1930 for specific occupational groups indicated also that there were wide variations among occupations and that unskilled factory and building construction laborers then had the highest rate both for tuberculosis and pneumonia. These variations in death rates by occupation suggest that the nature of the jobs performed by the workers influences their susceptibility to certain non-industrial diseases. Since employed workers spend a considerable portion of their days in their working environment, it appears to be a valid inference that the conditions under which they work are potent factors in determining their health. But more statistical research is necessary before the exact relation between the character of workers' jobs and nonindustrial disease rates is established.

Quoted from Stern, Bernhard J.: *Medicine in Industry*. New York, The Commonwealth Fund, 1946, pages 70-71.

Labor and other interested groups have asked the Tennessee Department of Public Health for data regarding death rates by occupation. . . . Because of these requests and because of establishment of an industrial hygiene service which had a director who wished to know the health problem in industrial groups, occupation and industry on death certificates have been coded, using the classifications of the United States Bureau of the Census. Although, because of movement of population and growth of industry, the period of time was unsatisfactory for the study of mortality, a start was needed. Many factors will have to be considered in interpretation of the data. . . . One of the difficulties encountered in analysis is the lack of census data by age and occupation for the white and nonwhite population of Tennessee. This is a serious problem, as death rates corrected for age for white and colored males and females are needed for understanding death rates by occupation groups. . . .

An attempt has been made to study mortality in Tennessee according to industrial classification of the Bureau of the Census as well as occupational groups . . . there are difficulties to be overcome in bringing together such data from the census and from death certificates. One difficulty is evident from the comparison of observed and expected deaths for those with no occupation or industry, that is, the unemployed. An industrial classification in the census was given for only employed workers and experienced workers seeking work or 79 percent of the white males 15 to 64 years of age. At the time of the census, 5 percent were on public emergency work, 1 percent were new workers seeking work and 15 percent were not in the labor force. In these unemployed persons, 2,439, or 17 percent, of the deaths would be expected to occur; however, only 1,038 death certificates, or 7 percent, were of persons without occupation or industry stated on the certifi-

cates. Although this discrepancy may be attributed in part to employment incident to the war and war service, this is not the entire explanation. In 1940, the percentage of death certificates without an occupation or industry stated was approximately the same as in this 3-year period. Thus, the data for occupation and industry on the census schedules and on death certificates differ considerably. Another difficulty which is our problem and can be overcome is lack of sufficient data for classification according to industry. There were 1,716 deaths, or 12 percent of the deaths, with data not satisfactory for industrial classification. For occupations such as laborers it will be necessary to obtain the kind of industry or kind of work. This analysis has a practical value for industrial health work in Tennessee and in other States. Satisfactory statistical data should be and can be provided.

Quoted from Puffer, Ruth R.: "Industrial and Occupational Environment and Health," Backgrounds of Social Medicine. New York, Milbank Memorial Fund, 1949, pages 125-129.

Table 54.—Death rates for male policyholders, Metropolitan Life Insurance Co., and for white males in the general population, by age group ¹

Age group (in years)	Death rates, 1938 (per 100,000)		Percent that group I rate is of group II rate	
	Group I	Group II		
	Industrial (white males)	Ordinary ² (total males)	1938	Similar percentages based on 1923 rates ³
Policyholders (Metropolitan Life Insurance Co.) ²				
All ages (20 and over)-----	1,267.1	882.1	143.6	186.9
20 to 24-----	225.8	174.2	129.3	119.9
25 to 34-----	313.4	189.1	165.7	186.7
35 to 44-----	617.6	381.9	161.7	207.1
45 to 64-----	1,389.3	876.9	158.4	192.4
55 to 64-----	2,914.5	2,143.4	136.0	164.0
65 and over-----	6,569.3	5,220.1	125.8	120.7
	Industrial policyholders, Metropolitan Life Insurance Co.	United States general population ⁴	1938	Similar percentages based on 1923 rates
White males				
All ages (15 and over)-----	1,040.7	1,333.6	78.0	85.5
15 to 24-----	190.9	213.6	89.4	95.4
25 to 34-----	313.4	298.8	104.9	121.5
35 to 44-----	617.6	545.9	113.1	181.9
45 to 64-----	1,389.3	1,144.2	121.4	142.9
55 to 64-----	2,914.5	2,413.8	120.7	133.9
65 and over-----	6,569.3	7,459.3	88.1	91.2

¹ Metropolitan Life Insurance Co., Industrial Department weekly premium-paying policies.

² In 1912 the expectation of life of a white male industrial policyholder aged 20 was about 8 years less than that of a male ordinary policyholder; by 1939 the advantage of the ordinary policyholder at age 20 was only 4 years.

³ Represents a group of male ordinary policyholders who were insured at standard rates and who included relatively few persons engaged in hazardous employment. Acceptability for insurance under ordinary policies is contingent upon the applicant's meeting somewhat higher standards of physical fitness than are applied to industrial policyholders. To make the mortality of the 2 groups more comparable, the death rates for ordinary policyholders does not include experience on policies issued during the previous 5 years; 1938 rates include issues of 1933 and earlier; 1923 rates, issues of 1918 and earlier.

⁴ Includes relatively fewer industrial wage earners than does the insured group. The findings reflect in some measure the effects of industrial exposure. Policyholders start out on their industrial careers in at least as good physical condition as other males, as shown by their relatively low mortality at ages 15 to 24. But soon the effect of conditions imposed by employment in industry and other factors become evident, and from about age 25 on, the insured have the progressively higher mortality. The gap between the 2 groups, however, is closing.

⁵ Data based on United States death registration States.

Source: Dublin, Louis I. and Vane, Robert J.: "Occupational Mortality Experience of Insured Wage Earners." Monthly Labor Review, 64:1003-1018 (June) 1947.

Table 55.—Deaths and death rates per 1,000 among gainfully occupied males 15 to 64 years of age, by social-economic status and age group, for selected States, 1930 ¹

Social-economic status	All ages (15-64)			Specific death rates for specified age group			
	Number of gainfully occupied males	Number of deaths	Standardized death rates ²	All ages	15-24	25-44	45-64
All gainfully occupied males.....	14, 013, 367	121, 951	8.70	8.70	8.15	5.50	17.93
Professional men.....	636, 608	4, 428	7.00	6.96	2.26	3.47	16.25
Proprietors, managers, and officials.....	1, 426, 425	12, 440	7.38	8.72	3.11	4.16	15.78
Wholesale and retail dealers.....	692, 515	6, 625	8.17	9.57	3.19	4.64	17.57
Other proprietors, managers and officials.....	733, 910	5, 815	6.65	7.92	2.98	3.72	14.16
Clerks and kindred workers.....	2, 216, 477	13, 793	7.40	6.22	2.30	4.11	16.46
Agricultural workers.....	2, 008, 330	13, 479	6.21	6.71	2.75	3.82	12.62
Skilled workers and foremen.....	2, 725, 992	23, 282	8.12	8.54	3.05	4.87	17.11
Semiskilled workers.....	2, 543, 762	22, 281	9.86	8.76	3.18	6.12	20.76
Semiskilled workers in manufacturing.....	1, 445, 259	13, 093	10.03	9.06	2.94	6.26	21.27
Other semiskilled workers.....	1, 098, 503	9, 188	9.62	8.36	3.66	5.95	19.98
Unskilled workers.....	2, 455, 773	32, 248	13.10	13.13	4.68	9.58	24.78
Factory and building construction laborers.....	1, 182, 541	19, 899	17.26	16.83	5.67	12.66	32.89
Other laborers.....	823, 647	6, 911	8.18	8.39	3.15	5.92	15.45
Servant classes.....	449, 685	5, 438	11.76	12.10	4.50	8.25	22.64

¹ Alabama, Connecticut, Illinois, Kansas, Massachusetts, Minnesota, New Jersey, New York, Ohio, and Wisconsin.

² Standardized according to age distribution of all gainfully occupied males in 10 selected States.

Source: Whitney, Jessamine S.: *Death Rates by Occupation: Based on Data of the U. S. Census Bureau 1930.* New York, National Tuberculosis Association, 1934, p. 17.

Industrial Health Hazards

Classification of Hazards

While there are several classifications of health hazards in industry, one version is to divide them into three types—chemical, biological, and physical.

Under *chemical hazards*, we have the important group of poisons, of which there are a great number and variety. Dublin and Vane list some 128 groups of industrial poisons in the United States, associated with approximately 1,500 occupational exposures, exclusive of substances that may cause dermatoses. These chemical elements and compounds may occur in the solid, liquid, or gaseous state. Whenever materials undergo changes in physical or chemical state or in physical size, some of the material, in the form of dusts, fumes, mists, gases, or vapors, will escape into the air of the workroom unless proper control measures are applied to prevent this atmospheric contamination. . . .

Biological health hazards include the infections, such as anthrax, tuberculosis, typhoid fever, pneumonia, and other respiratory diseases. Illness may result from the handling of contaminated materials such

as skins or wool infected with anthrax, from a lowering of resistance to infection by arduous duties and extreme changes in temperature exemplified by the high incidence of pneumonia in certain occupations in the steel industry; or by direct exposure to active cases of disease required by the nature of one's duties. The investigations of air bacteriology and studies of the methods of controlling bacterial contamination of the air have been extensive in recent years

The *physical health hazards* are extremely important in industry, since in this category are the accidents caused by machinery and other environmental conditions, and the physiological effects of excessive humidity, heat and cold, defective illumination, noise, repeated motion, shock, and abnormal atmospheric pressures.

Quoted from Bloomfield, J. J. "Industrial Health Hazards." *Industrial Safety* (Edited by Roland P. Blake). New York, Prentice Hall, Inc., 1943, pages 405-407.

The Physical Aspects of the Job

An important factor in a worker's job is the physical conditions of work. These include the intensity of work, the hazards of injury and occupational disease, the character of plant layout and sanitation, and the opportunities for rest and relaxation.

In all of these fields, important changes have occurred during the past half century. Of particular note is the rapid growth of occupations involving machine processes and in the number of mechanically paced operations. The rhythm of rest and work under such conditions has become more and more a process that is predetermined by engineering design, and workers have to adjust to it. But even in industries where the worker continues to exercise a good deal of control over the speed of operation, incentive methods of pay and the general development of production standards and preplanning of work have no doubt resulted in an increased pacing of work. In general, therefore, it may be concluded that workers today work with greater intensity than they did 50 years ago.

Improvements in plant layout, in lighting, and in general sanitary conditions of work have been very marked since 1900. In part, these improvements have resulted from the rise in standards of construction and in planning the factory for a sequence of processes and technical efficiency. But in large measure, these developments are also the outgrowth of a realization that improvements in production are not only the result of plant and machine, but are related to the physical well-being of the worker on his job.

Quoted from Ober, Harry "The Worker and His Job." *Monthly Labor Review*, 71: 22 (July) 1950.

Significant Materials to Which Workers Are Exposed

Table 56.—Significant materials to which more than 10 percent of the workers in surveyed industries and service groups were exposed, and number and percent of workers exposed ¹

Industry or service group	Materials	Exposed workers	
		Percent	Number
Extraction of minerals (55,676 workers).....	Coal dust, bituminous.....	60.6	33,732
	Silicate dust.....	55.4	30,827
	Silica dust.....	38.8	21,578
	Other gases.....	38.4	21,382
	Carbon monoxide.....	28.7	15,965
	Nonsiliceous dust.....	15.4	8,598
	Petroleum products.....	25.3	27,726
	Organic dust.....	23.5	25,722
	Other gases.....	20.7	22,690
	Organic solvents.....	17.9	19,611
Chemical and allied (109,387 workers).....	Other metals.....	17.2	18,783
	Alkalline compounds.....	17.0	18,581
	Dermatitis producers.....	16.5	18,019
	Carbon monoxide.....	14.7	16,045
	Oils, fats, and waxes.....	13.4	14,674
	Sulfur and its compounds.....	12.8	13,974
	Lead and its compounds.....	12.3	13,502
	Hydrogen sulfide.....	11.1	12,171
	Acids, mineral.....	11.1	12,117
	Nonsiliceous dust.....	10.5	11,467
	Organic dust.....	67.7	8,263
	Silicate dust.....	11.2	1,601
	Silica dust.....	34.7	22,866
	Silica dust.....	26.9	17,686
	Nonsiliceous dust.....	17.8	11,698
Carbon monoxide.....	11.0	7,217	
Organic dust.....	22.4	14,909	
Food and allied (157,145 workers).....	Dermatitis producers.....	34.9	64,815
	Organic dust.....	15.8	24,846
Iron and steel (383,989 workers).....	Other metals.....	34.2	131,411
	Carbon monoxide.....	15.4	58,970
	Petroleum products.....	13.5	51,971
	Other gases.....	13.4	51,627
	Silicate dust.....	11.6	44,724
	Silica dust.....	11.4	43,772
	Other metals.....	31.8	23,991
	Lead and its compounds.....	16.1	12,168
	Silica dust.....	14.5	10,926
	Silicate dust.....	14.4	10,856
Metal industries except iron and steel (75,407 workers).	Other gases.....	12.8	9,634
	Carbon monoxide.....	11.8	8,913
	Nonsiliceous dust.....	11.6	8,731
	Organic dust.....	15.9	10,039
	Organic dust.....	51.8	48,339
	Inks.....	14.3	12,484
	Lead and its compounds.....	13.1	11,381
	Organic dust.....	12.7	11,027
	Organic solvents.....	11.9	10,358
	Organic dust.....	60.4	70,699
Textile (117,124 workers).....	High humidity.....	18.9	22,113
	Organic dust.....	14.5	20,351
	Other metals.....	14.0	19,756
Miscellaneous manufacturing industries (140,832 workers).	Carbon monoxide.....	20.5	7,883
	Petroleum products.....	22.2	5,928
	Organic solvents.....	15.2	4,048
Transportation (26,707 workers).....	Other metals.....	13.7	3,654
	High humidity.....	14.1	4,352
	Organic dust.....	12.0	3,703

¹ Based on the results of surveys made under the direction of the Division of Industrial Hygiene, U. S. Public Health Service, in 15 States during the period 1936-39. The survey covered 1,487,224 workers who represented 3 percent of all the workers in the United States, 10.3 percent of all the workers in the 15 States furnishing reports, and 39.5 percent of all the workers in the 15 States, but limited to the industries selected for study. Approximately 60 percent of the workers were in plants of 500 or less.

Source: Bloomfield, J. J.; Trasko, V. M.; Sayers, R. R.; Page, R. T.; Peyton, M. F.: A Preliminary Survey of the Industrial Hygiene Problem in the United States. (Public Health Bull. No. 259), Washington, Government Printing Office, 1940, pp. 54-55.

Table 57.—Number and percent of workers in surveyed industries exposed to certain significant materials and number of workers in similar occupations in the United States expected to be exposed ¹

Materials	Workers		
	In surveyed industries		In similar occupation groups, United States ²
	Percent	Number	
Total workers.....		1,487,224	15,175,301
Exposed or expected to be exposed			
Nonmetallic dusts:			
Silicate dusts.....	9.4	140,461	1,433,231
Silica dust.....	7.5	111,969	1,142,503
Nonsiliceous dust.....	6.1	90,468	923,114
Coal dust, bituminous.....	4.2	62,667	639,442
Sulfur and its compounds.....	1.6	23,613	240,938
Asbestos dust.....	.2	3,425	34,949
Metallic dusts:			
Other metals.....	14.9	220,929	2,254,306
Lead and its compounds.....	5.2	76,743	783,076
Antimony and its compounds.....	.7	9,735	99,338
Chromium and its compounds.....	.5	7,976	81,385
Arsenic and its compounds.....	.2	3,356	34,251
Mercury and its compounds.....	.2	3,220	32,855
Cadmium.....	.2	3,031	30,927
Manganese and its compounds.....	.2	2,267	23,340
Gases:			
Carbon monoxide.....	9.8	145,051	1,480,062
Other gases.....	9.3	138,080	1,408,936
Sulfur dioxide.....	1.6	24,523	250,226
Hydrogen sulfide.....	.9	13,248	135,182
Organic dusts.....	18.1	269,385	2,748,748
Petroleum products.....	9.6	142,949	1,458,620
Dermatitis producers.....	9.4	139,456	1,422,973
Organic solvents.....	5.0	75,014	766,427
Alkaline compounds.....	3.9	57,603	587,770
Oils, fats, and waxes.....	3.9	57,284	584,507
Temperature change.....	3.0	44,436	453,408
High humidity.....	2.8	42,266	431,267
Acids, mineral.....	2.3	34,038	347,317
Salts, inorganic, analytical, technical.....	1.6	23,529	240,088
Paints and enamels.....	1.5	22,595	230,558
Inks.....	1.3	19,611	200,102
Lacquer and varnish.....	1.3	18,997	193,834
Infections.....	1.3	18,947	193,333
Alcohol, ethers, esters.....	1.1	16,952	172,968
Chemicals, organic and inorganic.....	1.1	16,406	167,429
Dyes.....	1.0	15,272	155,835
Coal tar products.....	.9	12,845	131,069
Acids, organic.....	.9	12,681	129,400
Cyanides.....	.4	5,815	59,335

¹ Based on the results of surveys made under the direction of the Division of Industrial Hygiene, U. S. Public Health Service, in 15 States during the period 1936-39. The survey covered 1,487,224 workers who represented 3 percent of all the workers in the United States, 10.3 percent of all the workers in the 15 States furnishing reports, and 39.5 percent of all the workers in the 15 States, but limited to the industries selected for study. Approximately 60 percent of the workers were in plants of 500 or less.

² Figures obtained by multiplying the entire working population as given by the 1930 census for the selected industries by the percent of workers exposed to the materials as found by the survey.

Source: Bloomfield, J. J., Trasko, V. M., Sayers, R. R., Page, R. T., Peyton, M. F.: A Preliminary Survey of the Industrial Hygiene Problem in the United States. (Public Health Bulletin No. 259.) Washington, Government Printing Office, 1940, pp. 56-58.

Occupational Disease Reporting

Reliable statistics on occupational diseases for the country as a whole are nonexistent and the need for them has been recognized for many years by industrial hygienists, insurance carriers, medical directors of private industries, trade associations, and many others.

Progress in the control of communicable diseases has been charted and determined at every point of the way through the mandatory reporting of all cases by physicians to their health department. A plan must be formulated whereby information on occupational diseases is made available for a corresponding evaluation. . . .

In view of the urgency of the need for such data, the Division has been interested for some time in serving as a central agency for the collection on a national scale of reports of occupational diseases. . . . A 2-year experiment to determine the feasibility of instituting a national system for uniform collection of reports of occupational diseases will be started this month by 10 Eastern States working with the Public Health Service, Division of Industrial Hygiene. . . . A pilot study will provide the opportunity to observe some of the differences in the States' methods of collecting information about occupational diseases, and give some insight into the problems and difficulties which contribute to the inadequacy of today's reporting situation.

If the pilot study proves that a central collection system is feasible, the Division will work directly with and through the State and local industrial hygiene units now functioning in 45 States and the District of Columbia.

These units will be requested to transmit to this Division on a special reporting blank pertinent information about certain occupational diseases. The National Office of Vital Statistics of the Public Health Service will cooperate in all aspects of the program.

As a result of conferences with representatives of this Division and of State health and labor departments and other persons, the following definition for a reportable disease has been drafted:

For reporting purposes, an occupational disease is any abnormal physiological condition due to a specific industrial hazard or hazards, other than traumatic injuries. It is a disease entity, or a group of symptoms and signs, which in most circumstances will fit into the categories listed below. It is recognized that differential diagnosis as to the occupation as a cause of the disease entity is sometimes very difficult.

I. OCCUPATIONAL DERMATOSES.

Examples: Contact dermatitis caused by primary irritants and sensitizers; oil acne; chrome ulcers; epitheliomatous cancer, etc.

II. OCCUPATIONAL DISEASES DUE TO DUSTS, FUMES, GASES, VAPORS, OR MISTS.

Examples: Silicosis, asbestosis or other pneumoconioses; poisoning by lead, mercury, cadmium, arsenic, or other metals; poisoning by carbon monoxide, chlorine, nitric oxides or other gases; poisoning by benzol, carbon tetrachloride, carbon disulfide, or other organic solvents; poisoning by insecticide sprays such as parathion, lead arsenate, etc.

III. OCCUPATIONAL DISEASES DUE TO PHYSICAL AGENTS (nontraumatic).

Examples: Ionizing radiation disease, welder's conjunctivitis, or glass blower's cataract; caisson disease; heat exhaustion; impaired hearing due to noise; tenosynovitis (nontraumatic), etc.

IV. OCCUPATIONAL DISEASES DUE TO INFECTIOUS AGENTS (excluding secondary infections subsequent to trauma).

Examples: Anthrax, brucellosis, Q fever, Newcastle's disease, byssinosis, fungous diseases such as sporotrichosis, blastomycosis, etc.

Quoted from United States Public Health Service, Division of Industrial Hygiene: "Ten Eastern States to Participate in Study of Occupational Disease Reporting." *Industrial Hygiene Newsletter*, 10:3 (May) 1950.

Table 58.—Occupational disease reports received by industrial hygiene agencies in 18 States ¹

Cause	Number of cases	Cause	Number of cases
Total.....	31,400	Poisoning due to—Continued	
Poisoning due to:		Dusts:	
Metals:		Silicosis.....	979
Arsenic.....	4	Silico-tuberculosis.....	33
Cadmium.....	21	Asbestosis.....	2
Lead.....	257	Byssinosis.....	2
Mercury.....	4	Pneumoconiosis, not specified..	270
Zinc.....	10	Systemic poisoning, not specified..	1,228
Metal fumes.....	7	Chemical poisoning, not specified..	186
Copper.....	3	Dermatitis, skin diseases.....	13,288
Solvents:		Conjunctivitis.....	4,893
Benzol.....	25	Pulmonary and bronchial affections...	1,616
Carbon tetrachloride.....	16	Pulmonary tuberculosis.....	67
All other solvents.....	7	Inflammatory conditions due to repeated motion, pressure, or shock..	2,380
Gases:		Heat exhaustion.....	112
Carbon monoxide.....	65	Anthrax.....	8
Chlorine.....	31	Undulant fever.....	178
Hydrogen fluoride.....	2	Nasal ulceration.....	137
Phosgene.....	10	Miscellaneous and not specified.....	533
Methyl chloride.....	2		
Gases not specified.....	24		

¹ Based on annual reports of industrial hygiene activities carried on by reporting agencies during the 1947 calendar or 1948 fiscal year.

Source: Trasko, Victoria M.: "The Work of State and Local Industrial Hygiene Agencies." *Public Health Reports*, 64: 471-484 (Apr. 15) 1949.

SECTION IV

Types and Extent of Plant Health and Medical Services

Plant Health and Medical Services

Basic Principles of Organization

Minimum Standard for Medical Service in Industry

1. The industrial establishment shall have an organized medical department or service with competent medical staff including consultants and also shall have adequate emergency, dispensary, and hospital facilities and personnel to assure efficient care of the ill and injured.

2. Membership on the medical staff shall be restricted to physicians and surgeons who are (a) graduates from an acceptable medical school, with the degree of doctor of medicine, in good standing and licensed to practice in their respective States or Provinces, (b) competent in the field of industrial medicine and traumatic surgery, (c) worthy in character and in matters of professional ethics; in the latter connection the practice of the division of fees, under any guise whatsoever, shall be prohibited.

3. There shall be a system of accurate and complete records filed in an accessible manner in the medical department, such records to include particularly a report of injury or illness, description of physical findings, treatment, estimated period of disability, and results, as well as other information pertinent to the case or required by statute for workmen's compensation claims or other purposes.

4. Patients requiring hospitalization shall be sent to institutions approved by the American College of Surgeons.

5. The medical department or service shall have general supervision over the sanitation of the plant and the health of all employees.

Working Principles of an Adequate Medical Service

1. A definitely organized plan for the medical service.

2. A definitely designated staff of qualified physicians, surgeons, and attendants.

3. Adequate emergency, dispensary, and hospital facilities.

4. Preplacement and periodic physical examinations—to be made only by qualified medical examiners.

5. Efficient care of all industrial injuries and occupational diseases.

6. Reasonable first aid and advice for employees suffering from nonindustrial injuries and illnesses while on duty. For further professional care such employees should be referred to their own private or family physicians.

Editor's note: The Minimum Standard and Working Principles above are used in the appraisals of industrial medical departments made by the American College of Surgeons on the request of the particular industries.

7. Education of the employee in accident prevention and personal hygiene.
8. Elimination or control of all health hazards.
9. Adequate medical records, accessibly filed in the medical department under responsible medical supervision.
10. Supervision of plant sanitation and all health measures for employees by the physician or surgeon in charge.
11. An ethical and cooperative relationship with the family physician.
12. The use of approved hospitals.

Principal Defects of Medical Services in Industry

1. The indiscriminate use of first-aid kits for the treatment of minor injuries still exists, though to a considerably lesser degree than in the earlier years of study made by the college. Often these first-aid treatments are self administered and the medical department has no knowledge of the injury unless it is subsequently seen as a secondarily infected case. This practice is vicious and economically most unsound and never should be permitted. However, for small plants not having the facilities of a plant dispensary, properly supervised use of first-aid kits is a necessity.

2. Many physicians in charge of industrial medical dispensaries have neglected to provide written "standing orders" or regulations to which dispensary attendants may refer in regard to handling medical and surgical cases which may arise during the physician's absence from the dispensary. The majority of physicians doing industrial work are employed on a part-time basis; hence it is advisable that dispensary attendants be informed as to proper procedures during the periods of the physician's absence. Verbal instructions do not provide adequate and infallible instruction.

3. A number of industrial establishments, both large and small, still maintain the practice of employing physicians on a call basis, for emergency service only. There may be periods of weeks and even months when the physician is not present in the plant dispensary. Consequently, the nurse in attendance is the supervisor of the whole medical service. It is generally conceded that a well organized medical service with a qualified physician in charge, who devotes some specified time to the medical department, will not only provide a more closely supervised service to both employer and employee, but will also more satisfactorily fix the responsibility of the medical service at one point.

4. One of the most consistent defects is found in the system of records maintained, and frequently this is the sole reason for the nonapproval of a medical service. Such recordings of injuries as "burn on leg," "cut finger," "foreign body in the eye," "contusion of hand or foot," etc., are examples of inaccurate descriptions of the specific anatomical sites of injuries. The cause of injuries and even

the treatment rendered may not be recorded. There may be no records in reference to progress of follow-up cases requiring daily attention. The preplacement physical examination form may be too brief, inadequate, and noninformative, poorly filled in, and not signed by the examining physician. Nonindustrial cases may not even be recorded, regardless of their nature. Medical records for every dispensary visit, both industrial and nonindustrial, should contain adequate information according to the outline under item 8 of part B of this section, according to the indications.

Occasionally medical records are kept on file in some other department, which is contrary to the best opinions and practices prevailing in industrial medical services. All medical records should be regarded as strictly confidential information and should be filed in the medical department under medical supervision.

5. Periodic health examinations were, through necessity, somewhat curtailed during the war emergency period. However, this important phase of an industrial medical service should not be lost. If such examinations are not possible for all, consideration should be given to certain groups, such as those with known physical defects, those holding key positions, those employed in departments where there is danger of occupational disease or at hazardous occupations, those over a certain age, such as 45 or 50, and those who handle food.

6. Perhaps the most consistent defect in medical service in industry is the apparent failure of the physician to acquaint himself with general plant sanitation, with special reference to plant inspections for the purpose of making personal observations and subsequent recommendations. This duty is often delegated to some other department; however, only a physician is qualified to recommend measures for general health and plant sanitation. Periodic inspections by the plant physician are worthy of consideration. Refer to clause 5 of the Minimum Standard for Medical Service in Industry.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, pages xli, 3, 47.

Medical Services in the Small Plant

Because of their numbers, the fact that they employ a majority of industrial workers, and have a much higher lost-time accident rate than larger establishments, it is obvious that the need of medical service in small plants is of paramount importance. Special attention is, therefore, given the subject in this publication. No matter how small the plant, it can afford the following medical services:

1. It can maintain a good first-aid kit and put it in charge of an employee trained in first-aid work.
2. It can institute a program for the prevention of occupational diseases and accidents.
3. It can educate its employees in matters pertaining to safety and health.

THE FIRST-AID KIT. Only the very small plant that is located in close proximity to a hospital, or has readily available to it the services of local medical practitioners, should limit its medical services to a first-aid kit.

Where reliance is to be placed on a first-aid kit, great pains must be taken to insure its greatest possible effectiveness. Careful thought must, therefore, be given to its *location* in the plant, its *contents*, and its *upkeep*. Someone must be given responsibility for the administration of first-aid care and for replenishing materials as they are used up. Otherwise the kit will soon become of little practical value in an emergency.

Obviously, a first-aid kit may be the source of a hazard rather than aid to the injured worker if anyone may have access to it; if its contents become contaminated by improper use; if labels which wear off are not replaced; and if anyone is free to store anything he wishes in the first-aid kit for safekeeping. . . .

THE FIRST-AID ATTENDANT. The most elaborate first-aid equipment is valueless if a properly qualified first-aid attendant is not available at all times to render first-aid treatment. In selecting a person to take charge of first-aid work, the employer should attempt to find someone who is intelligent, firm, tactful, observant, resourceful, sympathetic, explicit and dependable. . . .

PART-TIME NURSE AND PHYSICIAN. Although in the majority of small plants medical personnel is limited to individuals trained in first-aid work, the possibility of securing the services of a part-time nurse should not be overlooked, particularly where a part-time nursing agency is available. Such a nurse may make a real contribution to the health program of a small plant particularly if she has received some training in industrial hygiene.

Most small plants have physicians "on call" only. It is highly desirable even for physicians giving such limited service to familiarize themselves with the plant and with its possible health hazards so that they may be able to contribute to the development of a preventive program.

GROUP MEDICAL SERVICE. One method of arranging for the services of medical personnel, including physicians, for the small plant is through a cooperative group effort. A number of industrial plants situated in the same locality may pool their resources for the establishment of a joint medical service. The physician or physicians who provide their services to such a group then set up a central clinic reasonably accessible to all participants in the scheme. . . . Since cooperative action may be slow and difficult to achieve, it would seem that here is an opportunity for the exercise of initiative on the part of individual doctors interested in industrial work. Such physicians having hospital affiliations, well-equipped offices, and a knowledge of industrial hygiene can offer their services to a group of plants of their

own choosing and so develop a satisfactory part-time medical service for a number of establishments. In addition to first-aid treatment, physicians working for a group of plants should make periodic visits to the plants, periodically examine employees, institute measures for the control of health hazards, and, in general, furnish the same sort of medical service as might be found in a large establishment at a fraction of the cost to each individual plant.

No physician who undertakes such an enterprise should attempt to include a greater number of establishments than he can conscientiously care for. *His continued familiarity with actual working conditions in the plant is a requisite for effective service.*

ROLE OF PHYSICIAN AND NURSE. The duties of the part-time nurse and physician should include a complete appraisal of hygiene and safety in the small plant. Similarly a cooperative medical service, whether it be furnished by a group of physicians at the instigation of a group of plants, or by a physician acting on his own initiative, cannot be considered satisfactory unless it covers general plant hygiene and the prevention of occupational diseases as well as first-aid treatment.

Physicians offering service to industrial groups would do well to work in association with chemists and engineers to whom the plant may turn for technical advice.

ASSISTANCE FROM AGENCIES OUTSIDE PLANT. There are a number of agencies, both governmental and private, to which a small plant may turn, at no expense, for assistance and advice along the lines of accident and occupational disease prevention.

WORKER EDUCATION IN SMALL PLANTS. In small plants, workers can best be educated to a feeling of responsibility for their own part in the safety program by personal contact and explanation. Here the foreman's attitude can play an important part. The man responsible for the first-aid work must also constantly drive home to the other workers the need for first-aid treatment for even minor cuts and scratches. . . . First-aid men or foremen can also act as *safety committees of one* to instruct workers in the proper use and adjustment of guards, exhaust apparatus, respirators, etc. By such an individual's approach, his explanations, his care and interest, more can be accomplished than by formal talks or the distribution of leaflets.

Literature on the subject of health and safety is useful in conjunction with more personal efforts and can be obtained from various sources.

Quoted from Greenburg, Leonard; Smith, Adelaide Ross; and Mayers, May R.: *Essentials of Health Maintenance in Industrial Plants*. New York, State of New York Department of Labor, Division of Industrial Hygiene, 1942, pages 4-12.

Among the many unsolved problems in industrial medicine is that of furnishing adequate protection for the employees of small plants.

Plants with less than a thousand employees are often unable to supply adequate medical facilities at a cost which they regard as within their means. Certainly few of them can afford to employ a full-time physician; in some of the smaller plants it is not even feasible to employ a nurse on a full-time basis.

Ideally, it would be advantageous for a number of these plants to obtain the services of a physician, each paying a prorated amount. The shortage of physicians and the location of these plants in isolated places militate against such a program during the present emergency. Industrial hygiene clinics, offered as a suggestion, are only available in a few places.

It is doubtful if any plan could be developed which would be universally applicable to this group of plants. . . . The following suggestions are made with a hope that some of them may serve as a guide in solving this problem:

1. Combine resources where possible.
2. Utilize industrial hygiene clinics of good repute.
3. Seek advice of the State division of industrial hygiene in planning program, and in identifying and controlling occupational hazards.
4. Obtain the services of a visiting nurse if plant is too small to justify a full-time nursing program.
5. Even though the physician is part-time he should develop an interest in the preventive aspects of industrial medicine and in employee welfare. To this end the employment of physicians on an "on call" fee basis should be discouraged.

Quoted from Hedley, O. F.: "Medical Services." *Manual of Industrial Hygiene* (Edited by William M. Gafafar). Philadelphia, W. B. Saunders Co., 1943, pages 58-59.

On the basis of the information gathered from our study of the problem of fitting medical service to small- and medium-sized plants, we came to the following conclusions: 1. Plants vary sharply in their actual needs for medical service, and no standard pattern is practical. 2. Special consideration for the return on the dollar invested in medical service is necessary. There is no question concerning the general desirability of full-scale programs of medical service in plants of all sizes, but, from an economic standpoint, the medical programs designed for small- and medium-sized plants must be carefully adapted to the medical needs of these plants to minimize unwarranted expense. 3. Basically, effective medical service in any plant requires the support of management, coordination with the operating departments, and thoughtful adaptation for the specific needs of the plant. It is also essential that the medical service be furnished by a qualified physician who is thoroughly familiar with plant operations and plant personnel. The physician must definitely understand the relationship of his work with other procedures in the plant. His interest and active participation in obtaining maximum return for the money spent on the medical service are essential. 4. The number of em-

ployees in a plant is not in itself an adequate basis on which to determine the amount or type of medical service which a particular plant may require. 5. In fitting medical service to a small- or medium-sized plant, the following factors must be given consideration: (a) The number of persons, (b) their age (average), (c) the percentage of women, (d) the labor turnover, (e) the working conditions, (f) the location of risk, (g) the economic level of the workers and their intelligence, (h) existing medical plans, (i) the type of work according to physical demands, (j) existing community health plans, (k) exposure to occupational diseases, (l) the problem of traumatic injury, and (m) intangibles.

Quoted from Seymour, W. H.: "Fitting the Service to the Plant." Proceedings of the Seventh Annual Congress on Industrial Health. Chicago. The American Medical Association, pages 74-75. (Boston, September 30-October 2, 1946.)

Part-Time Nursing Service in the Small Plant

As rapidly as experienced nurses are available it seems advisable for visiting nurse agencies to extend service to as many small plants (especially those under 250 workers) as can be convinced of the value of the service. If such a service develops to the extent that it needs a full-time nurse the plant should be encouraged to take the nurse from the visiting nurse agency on its own payroll. This procedure is especially recommended if there is a well prepared industrial nursing consultant on the staff of a Government agency who can act as consultant to the nurse in the plant.

Promotion of a program for part-time service to industrial concerns by a visiting nursing agency is most effectively carried out in cooperation with all other organizations in the community which are concerned with industrial health, including management and labor organizations. An industrial advisory committee of the visiting nursing organizations seems to be the most satisfactory means of bringing representatives of these groups together for both planning and promotion. . . .

The minimum block of nursing time at one period in a plant having more than 35 workers should be 2 hours. The maximum of time and frequency of visits will depend upon the need, the interest of management, and the medical service available.

A ratio of 1 hour of the physician's time to 3 hours of the nurse's time has been found satisfactory in some plants and has been the goal toward which others are working. The nurse should be in the plant when the doctor is there. A ratio of 3 hours of the doctor's time to 9 hours of the nurse's time per 100 workers is desirable and necessary when comprehensive preplacement and periodic physical examinations are done. . . . part-time service to industry should be self-sustaining but not profit-making. The fee should not be so large that it seems exorbitant to management and so hamper the development of

the program. It may be advisable to have the service operate at less than cost at the start in order to demonstrate that a good medical program can more than pay for itself through reduction of compensation costs and absenteeism.

The need for simple, adequate, and inexpensive record forms is even more necessary in small plants than in large ones. Records must be confidential and kept in a locked file in the medical department. Arrangements must also be made for interpreting certain data to other persons interested in the proper placement and welfare of the workers.

Quoted from Fillmore, Anna M.: "Part-time Nursing Services to Small Industrial Plants." *Public Health Nursing*, 38: 454-55 (September) 1946.

Cooperative Small Plant Programs

Health programs were organized in 7 small plants varying in size from 70 to 700 employees and totaling 2,100 employees. The plants represented various types of industries such as food processing, chemical, machining, paint, and printing. Their participation in the program was enlisted through discussion with members of this office which represents the official health agency in this community.

This program consisted of:

1. Complete physical examination of the worker upon employment including a routine chest X-ray, serology test, hemoglobin determination, and urine examination.
2. Treatment of occupational conditions and emergency treatment of nonoccupational ones.
3. Health consultation and advice regarding any health problem.
4. Periodic complete physical examination.
5. Suitable referral service to private physician or agency.
6. Periodic plant surveys.
7. Organized programs concerned with other health aspects, such as nutrition, health education, accident, and absence studies.

The local medical society cooperated in furnishing physicians who were qualified to some degree, to plants requiring such physicians while the New York City Health Department furnished suitable qualified nurses,

Standards of equipment and design were furnished to the plants to aid them in setting up their medical departments. In addition, standard plant medical department forms were furnished and used.

The initial time standards used as a guide were 3 hours of doctor's time per week per 100 employees and 9 hours of nursing time per week per 100 employees. This standard varied somewhat in each plant as the program progressed, but can be used as an initial guide.

The costs of the service ran about \$13 per employee per year, or about \$1.09 per visit, excluding the initial capital cost of constructing a medical department which ran about \$1 per employee. The doctor's costs were from \$5 to \$10 per hour of in-plant service while the nursing cost ran between \$1 to \$1.50 per hour of in-plant service.

A health committee consisting of representatives of labor and management was set up in each plant and helped materially in promoting employee participation and in the solution of plant health problems.

Quoted from Millman, Nathan; Calderone, Frank A.; and Greenburg, Leonard: "Cooperative Plan for the Development of a Small Plant Health and Industrial Hygiene Program in New York City." *Industrial Medicine*, 15: 375 (June) 1946.

Under this plan, several small businesses, individually unable to afford good medical and safety programs, may jointly agree to establish and support a cooperative health center adequately staffed and equipped and conveniently located. The cost to each participating firm is proportionate to the number of workers employed and the services offered. Control of the center is generally invested in a board of directors representing one or more of the following: Management, labor, any nearby professional schools, medical societies, and public and private health agencies.

The minimum number of workers which a fully staffed center can serve economically appears to be about 1,000, regardless of the number of establishments. It appears that irreducible overhead expenses make the cost of adequate full-time service prohibitively high for smaller groups in a competitive business world.

The number and kind of professional employees of the center may be varied to suit the local situation and the size of the population served, but the recommended minimum personnel includes at least 1 full-time physician or the equivalent services of part-time physicians, 1 nurse for each 300 employees up to 1,000, and 1 additional nurse for each additional 1,000, a trained first-aid worker or nurse in each participating plant, and clerical help as needed.

Technical specialists, such as safety and industrial hygiene engineers, may be added to the staff as the center develops. Local professional schools help in securing a highly qualified professional staff; they provide laboratories and research; and they use the center for training physicians, nurses, engineers, chemists, and physicists.

The staff would require the following property and equipment to realize its full potential: A health center building conveniently located in the business community, general furnishings, special diagnostic equipment, instruments and supplies; in addition, each place of business must have its own first-aid room and supplies. The addition of a station wagon to this list may be required to facilitate emergency treatment and routine transportation, and the use of a mobile clinic, which has proved so successful in public health work, could be considered in future expansion plans.

Having provided a staff, quarters, and equipment, the participating concerns could reasonably expect in return these services:

1. Industrial health examinations of all members of the establishment—replacement, periodic and special.

2. Selective placement of workers—matching the abilities of the worker to the demands of the job.

3. Prompt emergency treatment of on-the-job accidents and illnesses, other illnesses being referred to the private physician.

4. Professional nursing services for ill employees, health education, home visiting, and the execution of the attending physician's instructions.

5. Other technical services such as engineering studies of environmental health and safety hazards of the business.

6. Adequate records (including confidential personal health records) which will be the basis for analyses of absenteeism, turnover, types of disability, defense against fraudulent disability claims, and honest evidence of just claims.

7. Coordination with, and full utilization of the social and health services of private and governmental agencies and resources. . . .

The outstanding advantage of the scheme is that it makes possible the invaluable service of decreasing human disability with its attendant cost and misery to a segment of business which has usually found such a service otherwise unobtainable. The plan does not require a participating business to surrender any of its prerogatives, and although advisory services are available from governmental agencies, governmental regulation and interference are avoided. . . .

Quoted from Petrie, L. M., and Lemon, J. W.: "A Health Program for Industry." *Industrial Hygiene Newsletter*, 10: 5-6 (December) 1950.

Six industries, employing between 300 and 800 persons, not exceeding a total of 3,500 employees, expressed their willingness to support an organized effort to equip and staff a service operating full time.

Four of these plants, prior to group effort, had functioning dispensaries of a sort, with one or more nurses. Two had the part-time services of physicians, who early indicated their willingness to relinquish their responsibilities to the companies to devote more time to their community practice. . . .

The plan as finally defined called for the full-time services of a physician (the author), who was to divide his time according to the needs and population of the several plants. The service charter which was drawn up at that time, and which is reproduced herewith in its entirety, best describes the details of the operating agreement.

Agreement

This Agreement made as of the ----- day of -----, 19--, by and between (six companies), hereinafter sometimes referred to as the "Companies," and (Dr. -----) of ----- County, Connecticut, hereinafter referred to as "Doctor."

Witnesseth:

WHEREAS the Companies desire the services of a physician trained in the field of industrial medicine,

WHEREAS Doctor is a duly licensed physician trained in and restricting his practice to the field of industrial medicine,

NOW THEREFORE, the parties hereto agree as follows:

1. In consideration of the payment of a fee to Doctor by the Companies in the sum of (-----) Doctor agrees to render medical services as hereinafter described to the employees of the Companies for one year from -----, 19--, such fee to be paid by the Companies and such services to be rendered by Doctor, on a percentage basis, in accordance with the following table:

<i>Company</i>	<i>Percentage</i>	<i>Fee</i>	<i>Hours of weekly services</i>
-----	20	-----	8
-----	10	-----	4
-----	15	-----	6
-----	15	-----	6
-----	15	-----	6
-----	25	-----	10
	100		40

The schedule of weekly service during the usual business hours at each Company's plant shall be arranged by Doctor and shall be subject to variation by him upon his giving reasonable notice to the companies except in the case of emergencies.

2. Each of the Companies agrees to pay to Doctor its share of his fee for professional services agreed to be rendered under this Agreement. . . .

3. Nothing herein contained shall be construed as forbidding Doctor from engaging in private practice. Doctor agrees that such private practice, except in the case of emergencies, shall not interfere with his obligations under this Agreement.

4. Doctor shall perform such professional services as physician for the benefit of the employees of the Companies as the Companies may require, but the Companies shall respect Doctor's professional status and shall make no direction or any requirement of him as to the method or manner of performing such services.

5. Each of the Companies agrees to provide on its own premises and at its own expense minimum facilities for the convenience and use of Doctor in discharging his duties under this Agreement, which facilities shall consist of a basic unit comprising a dispensary and instruments and supplies. . . .

6. Each of the Companies shall employ at least one full-time registered nurse during the term of this Agreement. None of the Companies, however, shall employ or discharge a registered nurse without prior consultation with Doctor. All registered nurses, trained attendants and first-aiders of the Company shall be responsible to Doctor in all matters concerning professional conduct.

7. Each of the Companies shall designate one of its officers or other executive employee who shall be responsible for all decisions as to all matters affecting his company arising under this Agreement and reported to him by Doctor.

8. Doctor shall furnish services and treatment under this Agreement to the employees of the Companies for occupationally incurred conditions only, except as provided in paragraph 11, and Doctor shall not be required under this Agreement to render treatment to the families or dependents of such employees.

9. Doctor agrees to refer any question of ethics which cannot be resolved between the parties hereto to the appropriate section of the Hartford County Medical Association.

10. Doctor's duties shall be as follows: In accordance with the ethics of medical practice of the American Medical Association and the County Medical Association, he shall:

(a) Give preplacement examinations of all applicants for employment by the Companies, take waivers of disabilities in connection therewith, and give re-examinations of employees both periodically and at the termination of their employment.

(b) Be available for private consultations with employees on the premises of the Companies.

(c) Treat occupational illnesses and minor occupational injuries of employees, and render first aid and advice on or about the premises of the Companies in the case of nonoccupational injuries and illnesses of employees.

(d) Furnish laboratory examinations for employees of such of the Companies as furnish requisite facilities therefor.

(e) Furnish advisory assistance to the Companies (1) in connection with established safety programs designed to reduce health and accident hazards associated with industrial materials, equipment, or plant conditions, (2) in matters of sanitation and nutrition and in the formulation of medical standards and (3) in connection with rehabilitation of injured employees and returning veterans, and make monthly recommendations thereon in writing to each of the Companies.

(f) Establish and maintain adequate medical records and statistics. Except as to the interpretation and presentation of such medical information regarding individual employees to officers and executives of the Companies employing them as is necessary for determining personnel policies and procedures, all physical and clinical records shall be confidential and accessible only to Doctor and to nursing personnel of the Companies responsible to Doctor.

(g) Promulgate and maintain appropriate standing orders for the registered nurses employed by the Companies.

(h) Supervise job placement on a medical basis.

11. Doctor shall give reasonable notice to each company of his absence or intended absence, as the case may be, to attend medical meetings, or on account of illness, vacation or for any other reasons. . . . Doctor agrees to limit his vacation to a period not in excess of two calendar weeks. . . .

12. Each of the parties hereto agrees to notify the other . . . of his or its intention to extend or renew this Agreement for the succeeding calendar year. . . .

IN WITNESS WHEREOF this Agreement has been duly executed by the parties hereto in septuplicate as of the day and year first above written.

Quoted from Buchan, Ronald Forbes: "Medical Services for Small Industrial Companies." *Occupational Medicine*, 5: 403-406 (April) 1948.

Since being opened in 1945, the clinic has been expanded to service more than 90 industrial firms ranging in size from a dozen to several thousand employees. The widely diversified work performed by those firms requires that the medical services be tailored to the needs of each plant.

Before those needs are determined, the plant is surveyed for the usual health problems and for the specific hazards incident to its operations. An attempt is then made to sell management an adequate—not superfluous—health program. Wherever possible, provisions are made for in-plant first-aid stations, with full- or part-time nurses' care or a suitably trained first-aid attendant. These come under the direct supervision of my colleagues and me, either on a basis of part-time physician's services in the plant or by periodic visits of a physician. On such visits, we go through the plant with the nurse, safety director, or other representative of management or

labor committees and discuss new hazards or current problems which always arise. Where engineering or health problems exist which can be analyzed further, without cost to the organization, by the Division of Industrial Health of the Minnesota Department of Health or the Department of Labor and Industry, we advise management which persons to make contact with. We feel that periodic visits to the plant are essential to keep aware of changing operations, introduction of new materials, and the physical demands of various employments, information which is of obvious value in effecting proper job placement and evaluation of health complaints. . . .

The amount of service authorized by management varies from care of trauma and periodic roentgenologic examinations of the chests of certain workers, as required by law, to a good in-plant medical service with attention to physical, mental, and social problems of the employees. The usual observation that management of a dirty, poorly operated plant will authorize only such care as the law demands, and that the management of a clean, progressive organization wants a reasonably adequate medical program is true in our experience.

Our aim is to adhere to the principles and standards advocated by the Council on Industrial Health of the American Medical Association and by the American College of Surgeons. We attempt to provide prompt and efficient care of all injured or ill employees, thorough preplacement and periodic physical examinations, with a minimum of waiting, and treatment of each employee with the same consideration given to a private patient. We make no compromise with honesty to curry favor with employee, employer, or insurer. Our clinic functions as an independent, private organization free from outside domination. That our work has been well received is attested by the evidence that our new accounts have originated mostly through the recommendations from representatives of labor and of management. The clinic is limited to industrial care; therefore, persons with nonindustrial medical or surgical conditions are referred to their own physicians for care. Also, any employee desiring to see his own physician for care or consultation regarding a compensable condition is encouraged to do so. These practices have resulted in pleasant relationship between our group and other physicians in the community.

The charges of the Northwest Industrial Clinic are almost entirely on a fee for service basis. Fees for all regular services are based on an average compiled by a statistical service from several large insurance companies and are acceptable to the insurers.

Most small plants lack the physical facilities to give more than first-aid service; therefore, the far greater part of our work is done in the clinic building. This aids our efficiency in time consumed because technical help, X-ray apparatus, fluoroscope, clinical laboratory, sterile surgical drapes, instruments, and working facilities are conveniently arranged. The plant management usually sends the

injured person in a company car which, because of our location, can be parked without delay at the front or the rear of the clinic building. The employee is given all necessary care and frequently is back in the plant more quickly than a physician could be expected to reach the plant except in such dire emergency that he would drop all other work.

Most plants request copies of the physical examination record. This is encouraged where there is a medical department with a medical file and where there is a nurse in attendance who can use the file for necessary follow-up. Where the report is handled by lay personnel, we encourage the use of the system of analysis of physical capacities and demands developed by the War Manpower Commission and the Kaiser Shipyards during the war. This has appeal in those plants which have developed systems of job placement by aptitudes and skills, since it is the logical complement to such tests. All reports of the physical observations, whether reported in full or by appraisal of capacities, are handed to the employee in an unsealed envelope, to be turned over by him to the medical or the personnel office. This removes the threat of breach of confidential information.

As was stated before, the plant nurse is expected to follow up correctable defects as has been recommended on the basis of our examinations. No compulsory methods are employed; therefore she must rely on repeated reminders to secure the compliance of the worker in consulting his private physician or dentist for correction of defects.

In cases of exposure to toxic substances, we follow recommended intervals of repeated examinations of blood smears, determination of hemoglobin content, blood cell counts, urinalyses and physical examinations. Special care is exercised in the placement of persons with histories of toxemia or hepatic or renal damage and of pregnant women. Where potentially toxic exposures exist, visits to the plant are made more frequently and often result in requests for assistance from the engineers and chemists of the State health department to evaluate the hazard and to suggest engineering methods for its control.

Quoted from Arling, Leonard: "Recent Experiments in Medical Service for Small Plants." *Occupational Medicine*, 3: 251-256 (March) 1947.

After 18 months of discussion with various agencies, including the local medical profession, industry, workmen's compensation, insurance agencies, and public health officials, we have adopted a compromise technic by which we propose to offer medical services to small industries in this community. We are quite aware that our plan is not the best one, but rather than discard the entire program, we have elected to make what we feel is the best of existing conditions. We propose to offer services to a group of about 5 plants whose total personnel shall be about 1,000. Each plant shall appoint a physician from among local practitioners in the community. This "plant physician" shall be responsible for the physical examinations and the

care of workers who become ill with industrial diseases or suffer industrial accidents. This physician is urged to acquaint himself with the plant, the nature of its operations, and its hazards and methods of control. Only in this manner can he perform his duties intelligently. In addition, there is to be an industrial nurse who shall divide her time among the five plants in accordance with her duties outlined above. The supervision of the entire program, and, more particularly, the industrial hygiene, shall be the duties of the Section of Preventive Medicine [Yale University School of Medicine]. This latter shall have recourse to a corps of specialists in medicine, surgery, industrial chemistry, and engineering. It is also considered the duty of the supervisor to utilize the records, clinical material, and experience involved in this program to study all the medical and public health problems associated with small industry, and to make efforts to improve the situation. The cost for these services will vary with the size of the plant, but can be vaguely calculated with these provisions in mind:

1. The plant physician shall receive not less than \$2 for each examination. His care of workers with industrial diseases shall be paid for on a fee-for-service basis.

2. The cost to the plant (for the year 1942) for the remaining services shall be \$1.50 per employee per year.

In comparison with the usual costs to industry for medical services of a comparable quality, these rates are cheap. Moreover, the National Association of Manufacturers, under the guidance of Dr. Victor G. Heiser, has made a detailed study of the costs and benefits of industrial medical services, and can demonstrate that these services pay for themselves. Unfortunately, despite all this, it has proved to be a most difficult assignment to sell such a service to industry in this community. There are probably many reasons why this is so, but perhaps the most important is that industry has not been educated to what industrial medicine and hygiene can do; to what the benefits are to industry and to the community as a whole; and to the fact that the return on the expended dollar is very good. Industry, alone, is not to blame. The medical profession, also, is still of the opinion that the physician does the healing and concerns himself little with prevention. When both these groups are properly educated to the full significance of industrial medicine, then, perhaps, real progress will be made.

Perhaps one of the greatest errors in our campaign has been a disregard of organized labor. This group is certainly vitally concerned with these programs, and should certainly be consulted. Moreover, they could play a very large part in an educational program aimed at enlightening the community in regard to these problems.

Quoted from Welt, Louis G.: "Industrial Medical Services for Small Industries." *The Yale Journal of Biology and Medicine*, 14: 675-676 (July) 1942.

It has been demonstrated in Philadelphia since 1926 that small industries can have a medical service favorably comparable to that of larger industries and at a cost not out of proportion to that which larger industries have to pay. . . .

The original plan was to group two or more plants into a single unit for joint medical service. This was spoken of as an "industrial health unit." Each unit was to consist of almost 1,000 employees. One industrial nurse, if her time was carefully scheduled, could successfully serve that number of employees and do the necessary travel between plants. Half the time of an industrial physician likewise was found to be sufficient for that number of employees. During the demonstration period the industrial nurse was carried at full time on the staff of the health council, doing other types of health work until, as each plant was added, her time was entirely absorbed by industry. Likewise, during the demonstration period, the full-time medical secretary of the health council, with previous experience primarily in industry, served as the industrial physician in starting the medical service in each plant.

In 1932 a modified plan was developed. An arrangement with the visiting nurse society was made to supply the necessary scheduled hours for each plant. This newer plan did away with the grouping of a few small plants into health units for the sake of making possible a part-time schedule. A plant of any size under the arbitrary number of 500 employees located in Philadelphia can begin a part-time medical service whenever it elects to do so. Where the community enjoys the service of a visiting nurse society, the part-time nurse's schedule would be simplified and the responsibility of the physician for details decreased. The original plan was put in operation by regular visits made throughout each week to each plant by the industrial physician and the full-time nurse, each of whom gave a definite amount of service to each plant. The modified plan is simply that the private physician gives regular service to a single plant or perhaps to two plants with a different visiting nurse furnishing the nursing service for each plant. Each regular visiting nurse has a well trained substitute who is prepared to step in whenever necessary. The amount of service given was estimated that for every hundred employees the plant should receive 3 hours of medical service per week, 1 hour of this being physician's time and 2 hours nurse's time. There has been no reason to deviate from this allotment of time when trying to interest a plant in the service in the beginning, but experience has shown that this proportion of time per week to the plant population is minimal and that a hazardous industry, or an industry having a need for more health work, may require more service.

The service offered the small plant is the same now as it was in the beginning. It consists of the following items: (a) A typical examination taking an average of 17 minutes on all present employees,

preferably on a tactfully compulsory basis rather than on a voluntary one. (b) A physical examination on all new employees. (c) An annual reexamination of all employees, taking an average of 15 minutes. (d) The assumption of the responsibility for the care of all plant accidents in the following way: (1) by taking care of the accident personally (physician or nurse) if the accident occurs during the hours of the medical service schedule; (2) by having a well-chosen first aid person take charge in their absence and, when advisable, telephone the doctor; (3) arranging with the surgical service of the nearest hospital to take care of serious accidents; (4) assuming charge of redressing all accident cases either when the individual is still on the job or, when off the job, if he is ambulatory and can travel back and forth to the plant dispensary; (5) arranging with an ophthalmologist to whom all plant eye accidents may be sent in absence of the physician or nurse. (e) The care of illnesses the individual may have while on the job, referring him to his family physician when he is too sick to work. (f) Attempting to diagnose chronic pathologic conditions and interpret their importance to the employee, referring him to his family doctor or diagnostic clinic. (g) Follow-up visits resulting from the original physical examination. (h) Home or hospital visits to the injured or sick in the capacity of a friend, never professionally, to determine the progress and estimate probable date of return to work for the benefit of the foremen of the department. (i) Health education—talks to groups of employees, posters on health bulletin boards, and pamphlets given to employees by the physician or nurse. (j) Sanitary survey of plant annually and frequent inspection throughout the year with particular reference to occupational hazards. (k) Accident prevention: (1) by cooperating with the safety program; (2) by getting an accurate report of the way each accident happened from the injured employee; (3) by following up the mechanical factor at fault to see that the accident does not happen again. . . .

The present cost of a part-time medical service is as follows: (a) Physician's time per scheduled hour, \$4. (b) Visiting nurse society's charge per scheduled hour, \$1.25. (c) Other items of cost based on a plant of 100 employees: (1) estimated cost per month of drug and dressing supply, \$15; (2) original cost of dispensary equipment—furniture, instruments, and so on, \$150; (3) original cost of drug and dressing supply, \$75; (4) original cost of constructing a two-room dispensary including sink, electrical fixtures, and outlets, from \$50 to \$500. If these items covering the original expense of setting up the complete dispensary are excluded, a plant of 100 employees could start a so-called minimal service for about \$10 a week. Experience has proved, however, that the single 1-hour-a-week visit by the physician and the 1-hour-a-week visits by the nurse as a minimal service is inadequate even in the quite small plants.

Interesting an employer in medical service for his employees has been a matter of intensive education and salesmanship. Education by any other than direct interview was not fruitful. Repeated announcements of the availability of such a service were made through the chamber of commerce and the trade associations without a single inquiry being made as to further details. In spite of the fact that this representative was fully informed on industrial health work and skilled in the psychology of salesmanship, it often took several interviews with the most health-minded employer before he felt ready to institute the service. In securing the first 9 or 10 firms with a total of about 4,000 employees, upward of 900 interviews and reinterviews were required. Of course, this included contacts with some forty or fifty firms which were not good prospects.

Six years has elapsed since the health council concluded its demonstration. During that time I have learned of no small plants in Philadelphia which have instituted any sort of a medical service, although probably a few have done so. . . .

The extent of the demonstration during those 7 years can be gaged by these facts: (1) Dispensaries were established in 31 plants which represented a total number of employees of 9,721, (2) 19 physicians and 22 nurses were employed for various periods in this work, and (3) the amount paid to those doctors and nurses was a total of \$62,078. The industries were diversified as to both kind and size. . . . The number on the pay roll in these plants varied from 25 in the yarn mill to 560 in the tannery, with an average of 200 for all plants. Many of the plants have discontinued the service. Of the 31 original plants, 13 still maintain their medical service. Of the 18 which discontinued the service the reasons, so far as have been learned, are as follows: nine apparently financial, four moved out of the city, leaving five the reasons for which are not known but which could be due to some fault of the service itself. I had the gratifying experience of spending from 6 months to 2 years in 27 of these plants before they were transferred, and since 1932 I have continued personally to maintain the service in 5 of them as an increasingly interesting full-time work.

Quoted from Everts, Glenn S.: "Medical Service to Small Industrial Plants: Means for Accomplishment," *Journal of the American Medical Association*, 112: 742-744 (Feb. 25) 1939.

In Williamsport our interest and activity in industrial health goes back to 1942. . . .

Our first step was to request the Bureau of Industrial Hygiene of the Pennsylvania Health Department to make an inventory of industries in Lycoming County from a standpoint of physical environment and health services. Of the plants surveyed, 56 percent employed 50 persons or less, 35 percent employed from 50 to 300 persons, and 9 percent employed over 300 persons.

The three largest plants already had integrated medical programs. Eighteen plants provided pre-employment physical examinations, with 12 providing periodic examinations. Only three plants had cafeterias for their employees. All in all, the survey clearly indicated the need for organized medical activities in local industries. It also furnished guidance as the program developed.

In 1943 we invited several physicians to our city to advise us on the formulation of a definite plan. Among those who came were Dr. Joseph Schilen of the State Industrial Health Bureau, Dr. Charles-Francis Long, Chairman of the Industrial Health Commission of the Pennsylvania State Medical Society, and Dr. Orlen J. Johnson of the American Medical Association's Industrial Health Council.

Together we considered features for an industrial health plan. The plan we developed was finally adopted at a joint meeting of our physicians' group and a newly created committee of our Community Trade Association, which is the chamber of commerce of Williamsport.

The details of the plan were then sent to various industrial leaders in our county, together with a list of physicians who had expressed themselves as interested and available for service.

Among other items, the plan provided remuneration for the physician on either an hourly basis or on what was essentially a contract basis. It included pre-employment examinations and job placement activities. It recommended that a given amount of time be spent weekly on health work within each plant, the amount to depend upon the number of employees, subject to agreement between the plant management and the physician. Health education, preventive medicine, and good nutrition were essential parts of the plan. The employment of an industrial nurse in the plant to keep records and to carry out the physician's orders was fundamental to the plan.

Upon the completion of the preliminaries, our first step toward activating the program was to communicate in writing with industrial leaders and to arrange personal interviews. This personal call was considered very essential as it permitted many specific questions to be answered. In each instance the call was made by the chairman of the physicians' group and by the manager of our Community Trade Association, who had the requisite entrée.

Much emphasis was placed on proper nutrition for the worker. The Westinghouse Co. was of great assistance here, sponsoring "Health for Victory" shows which we staged monthly in our local high school auditorium. A dietitian, supplied by the Pennsylvania Power & Light Co., demonstrated the proper preparation of foods, emphasizing the importance of a balanced diet. Audiences were composed mainly of housewives, who ordinarily prepare the workers' meals. . . .

Also, we viewed locally a movie produced by General Motors on the subject of industrial health. In consequence, we determined to arrange an Industrial Health Conference for central Pennsylvania, to

be held in Williamsport. This plan carried through, and an all-day meeting, with luncheon at the Lycoming Hotel was held. In attendance were physicians, business leaders, workers, industrial nurses, and representatives of our Pennsylvania Industrial Health Bureau.

At the Conference there was an exhibition of equipment for a first-aid station or dispensary, and also an exhibit to demonstrate the services available without charge to any concern in the State from the Industrial Health Bureau. The morning session was devoted to formal papers, while the afternoon session was a forum providing an opportunity for questions from the audience.

In 1944 we initiated a program of mass chest X-rays in Williamsport and Lycoming County. To date we have X-rayed about 18,000 workers out of a possible 22,000. . . .

In 1947 we decided to give a course on the general subject of industrial nursing to nurses who were doing industrial work. This course, with classes 1 night a week, was given at our noted Williamsport Technical Institute. There were 50 registrants coming from as far as Wellsboro to the north, and Sunbury to the south. The course lasted 10 weeks, with a final examination and graduation during the eleventh week. . . .

In 1948 we felt that the subject of industrial health might be kept alive locally if we issued and distributed, at intervals, an "Industrial Health Bulletin," with articles by local physicians, safety engineers, sanitarians, and other specialists. We have been issuing these bulletins from time to time, and the results have been quite satisfactory.

Quoted from Harley, John P.: "Health Progress in the Local Community: Williamsport's Industrial Health Program." *American Economic Security*, 6: 47-50 (June) 1949.

To bring about a reduction in the time lost in industry from sickness and accidents and to otherwise conserve manpower during the war, the following plan is proposed by the Industrial Health Committee of the Lycoming County [Pa.] Medical Society.

1. A physician shall be engaged to spend a stipulated amount of time in the plant. His duties to be:

(a) Supervise sanitation and working conditions and become acquainted with requirements of operations and processes.

(b) Preplacement and periodic physical examinations.

(c) Health consultation and education of workers—individually and as a group.

(d) Treatment of minor injuries occurring while he is in the plant.

(e) Supervise the keeping of adequate and accurate records of absenteeism. Consideration of the results to improve the health of the workers.

The amount of time to be spent in the plant at definite periods to be determined by management and the physician. The following minimum is suggested. One hour a week per 100 workers (or less). As the service develops it will unquestionably need to be increased.

To assist in selecting a physician a list of members of the Lycoming County Medical Society cooperating will be drawn up. A plan of rotating these physicians among the participating plants will be made, or each plant may arrange for a certain physician to render the service permanently.

Remuneration for this service shall be paid directly to the physicians. The suggested rate being \$7.50 per hour, or — per annum per unit described above.

Having a physician spend time in the plant is fundamental in such a program. From such a program properly carried out, an industry may expect:

1. Reduction of absenteeism from sickness and accidents.
2. Greater efficiency from workers from better placement and health.
3. Reduction in insurance premium.
4. Stabilization of working force.

Quoted from Chamber of Commerce of the United States, Health Advisory Committee: "Proposed Plan of Industrial Health for Small Plants in Lycoming County." *Industrial Health: A Tale of 3 Cities.* Washington, The Chamber, 1944.

The Utilization of Services

The following types of cases, services, or functions fall within the classification of direct service:

The immediate, on-the-job care, treatment, recording, and disposition of the following types of cases:

	<i>Percent</i>
1. New injuries—minor and serious.....	45
2. Redressing or retreatment of all injuries.....	25
3. Medical complaints—minor and serious.....	26
4. Checking returning, sick or injured absentees, as to fitness to work safely, etc.....	4
	100

The proportions, shown on the right as percentage, represent an average day's work.

Let us enumerate and discuss some of the highlights of direct service.

1. Cannot be avoided. Establish a medical room of any size or description that is accessible to people at work, and those people will produce the demand for the first three. To attempt to control this too drastically is a short-sighted policy. As to the fourth, supervision having any degree of human interest in the employee will create the demand for this service.

2. Direct services form an uninterrupted flow throughout the entire working span. Even though the number of people remains constant, they will nevertheless produce wide variations in the daily and hourly number of contacts. Medical staffing to meet these peaks must be flexible. Service must be immediate and complete within the working hours.

3. An 8-hour work shift requires a span of 9 hours of medical coverage.

4. These services are the FIRST on the list to be performed. They must be completed before other services and duties can be undertaken effectively.

5. From 1 to 1.5 percent of these cases will be emergencies, varying from death to cases requiring contact with private physicians and transportation to hospital or home. They require undivided medical attention and time, amounting to never less than 30 minutes.

6. In number, these services form the bulk of medical contacts. Repeated analyses of records and observations of direct-service cases over a period of years result in the same general round-figure conclusions. . . . From 80 to 85 percent of visits for injury or medical complaint are produced by 30 percent of the people. From 60 to 70 percent of the individual minor "sick" absences (less than 8 days) are produced by 20 percent of the people. With few exceptions, the same individuals remain in these groups year after year. . . .

7. In *manufacturing* industry, people who have free access to an established medical dispensary will produce one direct-service visit per shift for each 15 people working. This is an *annual* daily or shift average. We noted this 1:15 ratio in 1937 while casting about for some reasonably reliable formula for forecasting the potential number of cases varying numbers of employees would produce. By 1943 its consistency and parallel correlation with other medical directors were sufficient to warrant publication. . . . The data presented here represent a number of different types of manufacture, covering peace and war; 5-day, 40-hour single-shift weeks, and 6-day 48-hour multiple-shift weeks; and all male as well as mixed sex employees. . . . Why is this 1:15 rate factor so consistent? It does not correlate with plant health or national health. In contrast to 1938 (1:15.19) and 1942 (1:15.05) both of which were relatively *healthy* years, the ratio of 1:15.85 for 1943 is the lowest in this group. Yet 1943 had a *higher* general *morbidity rate nationally* and witnesses a definite epidemic of so-called influenza in December. . . . the consistency of this factor can be explained on the basis of a constant and sizeable dilution of real physical complaints by an invariable aggregate of universal human relations and reactions.

Quoted from Fulton, William J.: "Industrial Medical Potentials—A Time and Job Analysis of Medicine in Industry." *Industrial Medicine*, 18: 272-276 (July) 1949.

No clear-cut line can be drawn between disabling and nondisabling illness. The same case causing equal discomfort to two workers may be regarded by one of them as incapacitating, by the other as insufficient cause for interrupting work.

Personal idiosyncrasy plays an important role in determining whether work shall be continued during minor illness. On the one hand, there are instances of crass malingering, and on the other of a reckless

determination to keep at work. The number of cases at either extreme, however, is probably relatively small.

The number of nondisabling cases ordinarily is much larger than the number of disabling illnesses. So far as plant infirmary records are concerned, such records for one manufacturing plant, covering a 5-month period, reveal that on the average only 3 percent of the employees visiting the plant infirmary were considered disabled for work and sent home.

The plant dispensary affords some valuable information on the extent and nature of nondisabling illness. Records of an ordnance plant over a period of a year, covering a population with 14 percent females, reveal that the medical department received, on the average, almost five visits per person due to nonoccupational complaints.

Six conditions caused 65 percent of all visits—headaches, 21 percent; gastro-intestinal upset, 12 percent; colds, 12 percent; sore throat, 11 percent; dysmenorrhea, 5 percent; and nervousness, 4 percent. Dysmenorrhea resulted in slightly more than 1.5 dispensary visits per female.

Medical treatment in the plant for headaches, cold, digestive illnesses, and other minor conditions is usually justified on economic grounds. It is assumed that the discomfort from impaired physical condition prevents the worker from attaining full productive efficiency.

Medical service which shortens the duration of discomfort and, accordingly, the period of reduced output is of value both to employer and employee. Prompt treatment of incipient illness may also prevent the development of cases causing absence from work, or at least shorten the subsequent period of disability.

Medical service in the plant is not, however, concerned entirely with treatment. It also affects employee morale, which is as important as any skill the employee may have developed. Many factors make for good morale—or the will to work—one of which no doubt is the feeling on the part of the employee that if he becomes ill during work periods he will receive adequate care.

Quoted from Gafaer, William M.: *Illness in Industry* (Health Practices Pamphlet No. 19). Chicago, National Safety Council, Inc., 1946, pp. 1-2.

Trends in Utilization of Medical Care

In a comparison of the statistics of the earlier surveys, of the American College of Surgeons, made from 1929 through 1940, of 1,596 industrial establishments, with the statistics of the more recent surveys of 345 industrial organizations made from 1941 through 1945, the following trends are noted:

1. The number of male employees in industry has been decreasing while the number of female employees has been on the increase. In a Nation that has just completed its engagement in a gigantic war effort, this fact becomes readily understood.

2. The greater part of workmen's liability insurance of industrial establishments is underwritten by an insurance carrier. As previously implied, this may be due to the majority of States having in recent years enacted legislation in reference to occupational diseases, industry electing to rely on some indemnity organization to represent its interests.

3. The majority of medical services in industry function under the personnel department, a department which has been considerably advanced in rank within the past few years.

4. The number of physicians and nurses engaged in industrial work has greatly increased.

5. The routine practice of making preplacement and periodic physical examinations has increased.

6. The practice of including Wassermann, Kahn, or Kline tests as a routine part of the preplacement physical examination shows a greater gain than any other single practice.

7. The percentage of plants providing extended medical care to their employees remains essentially unaltered.

8. Supervision of health and sanitation in the majority of the plants is assigned to the medical department.

9. The number of approved hospitals whose facilities are used by industrial establishments is increasing, with over 90 percent of the establishments now using approved hospitals.

10. Medical services provided by industry show progressive improvement, and more and more they are complying with the minimum standard as formulated by the American College of Surgeons. The marked increase in approved medical services in the small and medium size plants is particularly in evidence.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, page 45.

Table 59.—Average number of dispensary calls and physical examinations made daily in surveyed establishments, by size of establishment ¹

Size class (number of employees)	Number of establishments surveyed	Number of employees in establishments	Average number of services per establishment			
			Dispensary calls	Physical examinations		
				Preplacement	Periodic	Return-to-work
All establishments.....	278	1, 180, 551	169	14	10	5
Under 500.....	43	15, 945	18	4	3	2
500 to 999.....	49	47, 399	25	3	3	2
1,000 to 1,499.....	50	89, 541	39	7	5	3
1,500 to 1,999.....	17	38, 082	51	9	7	5
2,000 to 3,999.....	42	93, 014	114	9	20	4
4,000 to 9,999.....	43	231, 157	233	15	8	6
10,000 and over.....	34	665, 413	772	49	22	12

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about a fourth of whom were women. About 5 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

Source: Sappington, C. O.: *Industrial Health Department Functions and Relationships* (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundations, 1948, p. 34.

Available Personnel and Services

Table 60.—Percent of surveyed establishments with specified health personnel and services; a comparison between establishments surveyed during 1930–40 and 1941–48 ¹

Item	Establishments surveyed		Amount of increase or decrease
	1930–40	1941–48	
Number of establishments surveyed.....	1,570	570	-----
Percent with approved or provisionally approved medical services.....	57	77	+20
Percent with specified type of personnel:			
Full-time physicians.....	24	28	+4
Part-time physicians.....	43	56	+13
Physicians on call.....	33	16	-17
Nurses.....	64	96	+32
Percent providing specified type of service:			
Preplacement physical examinations:			
Routine.....	64	85	+21
Special groups.....	8	10	+2
None.....	28	5	-23
Periodic health examinations:			
Routine.....	17	24	+7
Special groups.....	24	50	+26
None.....	59	26	-33
Routine blood serology.....	2	49	+47
Medical supervision, health, and sanitation.....	38	65	+27
Use of approved hospitals ²	86	95	+9

¹ Based on a personal survey of medical services in industrial establishments. A certificate of approval was given by the American College of Surgeons to each establishment in which the medical organization and service were fully approved and were of such a nature as to give reasonable assurance of continued compliance with the minimum standards for medical service in industry formulated by the College's committee on industrial medicine and traumatic surgery.

² For hospitalizing industrial cases.

Source: Hess, Gaylord R.: "Basis of Approvals of Medical Services in Industry," *Industrial Medicine*, 18: 297 (July) 1949.

Table 61.—Number and percent of surveyed establishments with specified health personnel and services ¹

Item	Establishments	
	Number	Percent of total
Doctors: ²		
Full-time doctors only.....	15	7
Part-time doctors only.....	168	79
Both full- and part-time doctors.....	21	10
Nurses: ²		
Full-time nurses only.....	165	78
Part-time nurses only.....	29	14
Preventive services:		
Physical examinations at employment.....	185	87
Periodic reexaminations.....	78	37
Studies of occupational health hazards.....	184	86
Supervision of the correction of physical defects.....	128	60
Diagnostic service.....	86	40
Mental tests.....	27	13
Curative services:		
Treatment for minor illness.....	184	86
Minor operations.....	193	91
For accidents only.....	151	-----
Arranged through mutual benefit associations.....	16	-----
Major operations.....	48	23
For accidents only.....	14	-----
Arranged through mutual benefit association.....	5	-----
Treatment for major illnesses.....	28	13
For occupational illness only.....	4	-----
Eye examinations.....	96	45
Part of employment examination.....	15	-----
Periodic health reports to family physicians.....	33	16
By request.....	15	-----

See footnotes at end of table.

Table 61.—Number and percent of surveyed establishments with specified health personnel and services¹—Continued

Item	Establishments	
	Number	Percent of total
Curative services—Continued		
Dental service.....	16	8
Results of accidents only.....	6	-----
On payroll deduction basis.....	2	-----
Cleaning and diagnosis only.....	2	-----
Extractions only.....	3	-----
X-ray service.....	2	-----
First-aid treatment for major illnesses.....	125	59
Related activities:		
Sanitarium privileges.....	27	13
Employees contribute toward medical expenses.....	30	14
Rest rooms.....	104	49
For women only.....	16	-----
Restaurant, cafeteria, or other lunchroom facilities.....	187	88
Dressing rooms, lockers, and shower baths.....	190	89

¹ Based on a survey of 213 establishments which were members of the National Safety Council. The total number of employees covered were 657,937. 45 or 21 percent of the establishments employed 500 or less workers and 57 or 27 percent employed 501 to 1,000 workers.

² There were altogether 133 full-time doctors and 1,289 part-time doctors employed by these establishments. ³ There were altogether 565 full-time nurses and 58 part-time nurses employed by these establishments. There were also 33 visiting nurses.

Source: National Safety Council. *Health Service in Industry* (Health Practices Pamphlet No. 5). Chicago, The Council, 1939, pp. 8-9.

Table 62.—Number and percent of workers eligible for industrial health service in plants employing more than 100 workers as compared with plants employing 100 workers or less, by type of service¹

Type of service	Number of workers eligible for service in plants with—		Percent of workers eligible for service in plants with—	
	More than 100 workers	100 workers or less	More than 100 workers	100 workers or less
Total number of workers in plants.....	1,128,553	358,671	-----	-----
Safety provisions:				
Safety director, full-time.....	372,588	7,854	33.0	2.2
Safety director, part-time.....	328,587	42,752	29.1	11.9
Shop committees.....	712,779	44,867	63.2	12.5
Other services.....	554,272	66,221	49.1	18.5
Medical provisions:				
Hospital ²	217,455	11,743	19.3	3.3
First-aid room.....	733,681	24,563	65.0	6.9
First-aid kit.....	1,030,196	326,776	91.3	91.1
Trained first-aid worker.....	644,194	62,000	57.1	17.3
Plant physician, full-time.....	229,384	1,543	20.3	.4
Plant physician, part-time.....	311,090	19,946	27.6	5.6
Plant nurse, full-time.....	493,424	2,059	43.7	.6
Plant nurse, part-time.....	20,978	1,762	1.9	.5
Disability statistics:				
Sick benefit association.....	570,481	47,989	50.6	13.4
Sickness records.....	624,540	50,619	55.3	14.1
Accident records.....	1,099,618	297,766	97.4	83.0

¹ Based on a survey of 16,803 plants in 15 States, made under the direction of the Division of Industrial Hygiene, U. S. Public Health Service, during 1936-39. The 1,487,224 workers in the surveyed industries represented 3 percent of all the workers in the United States, 10.3 percent of all the workers in the 15 States furnishing reports, and 39.5 percent of all the workers in the 15 States, but limited to the industries selected for study. Approximately 60 percent of the workers were in plants of 500 or less.

² Company hospital or definite contract with a hospital for care of workers.

Source: Bloomfield, J. J., Trasko, V. M., Sayers, R. R., Page, R. T., Peyton, M. E.: *A Preliminary Survey of the Industrial Hygiene Problem in the United States* (Public Health Bull. No. 259). Washington, Government Printing Office, 1940, p. 38.

Table 63.—Percent of surveyed establishments with specified health personnel and services, by size of establishment ¹

Item	Establishments in specified employee size class				
	All establishments	Under 100	100-499	500-999	1,000 and over
Number of establishments.....	611	117	200	98	196
Number of employees covered (in thousands).....	1,120.0	5.5	48.9	64.0	1,001.7
Percent employing personnel					
Full-time physicians.....	24.7	0	18.5	21.4	47.4
Full-time nurses.....	42.4	2.6	19.5	52.0	84.7
Part-time nurses.....	7.0	5.1	7.5	15.3	3.6
Percent providing services					
First aid.....	92.1	80.3	93.0	94.9	96.9
Care for workmen's compensation cases.....	91.0	84.6	90.0	92.9	94.9
Preemployment examinations.....	75.5	46.2	68.5	85.7	94.9
Periodic examinations.....	49.6	23.1	42.5	52.0	71.4
Accident and disease prevention.....	68.1	41.9	62.0	77.6	85.2
Plant sanitation.....	53.0	23.1	44.0	57.1	78.1
Health education.....	39.4	9.4	29.5	42.9	65.8
Medical advisory service.....	57.0	28.2	54.5	57.1	76.5
Clinical laboratory ²	42.1	29.9	39.5	36.7	54.6
X-ray ²	46.5	42.7	41.5	38.8	54.6
Physiotherapy ²	39.1	23.1	30.5	43.9	55.1
Dental service.....	7.9	.9	4.0	4.1	17.9

¹ Based on questionnaires sent by the Council on Industrial Health to physicians engaged full or part time in industrial practices.

² In the plant or readily available.

Source: American Medical Association, Council on Industrial Health: "Industrial Health: A General Statement of Medical Relationships in Industry Presented by the Council on Industrial Health." Journal of the American Medical Association, 114: 578 (Feb. 17) 1940.

Table 64.—Extent of nursing participation in specified health and safety activities in surveyed establishments classified according to size ¹

Activity	All establishments	Establishments in specified employee size class				
		Less than 500	500-2,499	2,500-4,999	5,000-9,999	10,000 and over
Number of establishments surveyed.....	868	139	501	108	67	53
Percent with nursing participation in indicated activity						
A. Nursing treatment and care.....	All	All	All	All	All	All
B. Assistance with physical examinations and technical services.....	50	31	48	64	64	79
C. Health education activities.....	15	13	17	9	12	13
D. Home nursing service.....	25	29	25	21	25	25
E. Safety and sanitation activities.....	46	63	52	27	19	11

See footnote at end of table.

Table 64.—Extent of nursing participation in specified health and safety activities in surveyed establishments classified according to size¹—Con.

Activity	All establishments	Establishments in specified employee size class				
		Less than 500	500–2,499	2,500–4,999	5,000–9,999	10,000 and over
Number of establishments surveyed.....	868	139	501	108	67	53
Percentage distribution according to extent of activities ²						
Total.....	100	100	100	100	100	100
A only.....	20	22	19	21	24	13
A+B.....	21	6	17	38	34	44
A+B+E.....	11	12	12	8	6	9
A+B and various combinations with C, D, E.....	18	13	19	18	24	26
A+E.....	16	24	19	7	-----	2
A+E and combinations with C, D.....	9	17	10	3	6	-----
A+C and/or D.....	5	6	4	5	6	6

¹ Based on a Nation-wide survey in 1942 of 924 establishments, employing approximately 2.5 million workers, conducted by the Committee to Study the Duties of Nurses in Industry, American Public Health Association, with the assistance of the Division of Industrial Hygiene, National Institute of Health. The above tabulation is based on information received from 868 establishments reporting the employment of at least 1 full-time registered professional nurse. A total of 3,027 nurses were employed.

² For brevity, letters are used to designate the activities referred to above.

Source: Whitlock, Olive M., Trasko, Victoria M., Kahl, F. Ruth: Nursing Practices in Industry (Public Health Bull. No. 283). Washington, Government Printing Office, 1944, p. 29.

Table 65.—Extent of nursing participation in specified health and safety activities in surveyed establishments classified according to amount of medical direction¹

Activity	All establishments	Establishments with physicians serving—		
		Full time	Part time	On call
Number of establishments surveyed.....	868	198	324	346
Percent with nursing participation in indicated activity				
A. Nursing treatment and care.....	All	All	All	All
B. Assistance with physical examinations and technical services.....	50	77	70	17
C. Health education activities.....	15	19	15	12
D. Home nursing service.....	25	29	18	31
E. Safety and sanitation activities.....	46	16	45	64
Percentage distribution according to extent of nursing activities ²				
Total.....	100	100	100	100
A only.....	20	14	17	25
A+B.....	21	42	26	3
A+B+E.....	11	6	21	5
A+B and various combinations with C, D, E.....	18	29	23	9
A+E.....	16	1	8	31
A+E and combinations with C, D.....	9	1	3	20
A+C and/or D.....	5	7	2	7

¹ Based on a Nation-wide survey in 1942 of 924 establishments, employing approximately 2.5 million workers, conducted in 1942 by the Committee to Study the Duties of Nurses in Industry, American Public Health Association, with the assistance of the Division of Industrial Hygiene, National Institute of Health. The above tabulation is based on information received from the 868 establishments reporting the employment of at least 1 full-time registered professional nurse.

² For brevity, letters are used to designate the activities referred to above.

Source: Whitlock, Olive M., Trasko, Victoria M., Kahl, F. Ruth: Nursing Practices in Industry (Public Health Bull. No. 283). Washington, Government Printing Office, 1944, p. 27.

Table 66.—Extent of nursing participation in certain health and medical activities in surveyed establishments classified according to amount of medical direction ¹

Activity ²	All establishments	Establishments with physicians serving—		
		Full time	Part time	On call
Number of establishments surveyed.....	868	198	324	346
Percent with nursing participation in indicated activity				
Assistance with physical examinations, if given: ³				
In the plant.....	84	80	87	83
Outside the plant.....	10	14	14	9
Urinalyses and other laboratory tests ³	37	34	57	11
Responsibility for return-to-work permits.....	43	28	44	51
X-ray work ³	48	48	51	43
Health education and supervision.....	15	19	15	12
Organized classes in home nursing.....	3	5	2	3
Home nursing service.....	25	29	18	31
By plant nurse.....	19	9	15	29
By plant visiting nurse.....	6	20	3	2
Specific participation in 1 or more activities listed above.....	65	85	75	43
Limited or no participation in activities listed above.....	35	15	25	57

¹ Based on a Nation-wide survey in 1942 of 924 establishments, employing approximately 2.5 million workers, conducted in 1942 by the Committee to Study the Duties of Nurses in Industry, American Public Health Association, with the assistance of the Division of Industrial Hygiene, National Institute of Health. The above tabulation is based on information received from the 868 establishments reporting the employment of at least 1 full-time registered professional nurse. A total of 3,027 nurses were employed.

² Nursing treatment and care omitted since practically all industrial nurses participate in this activity.

³ Percentages are based on plant practices with regard to these activities. Of the 868 establishments surveyed, 59 percent required laboratory tests, 20 percent had X-ray facilities, 53 percent gave physical examinations in the plant and 29 outside of the plant.

Source: Whitlock, Olive M.; Trasko, Victoria M.; Kahl, F. Ruth: Nursing Practices in Industry (Public Health Bull. No. 283). Washington, Government Printing Office, 1944, p. 13.

Table 67.—Percent of surveyed establishments reporting the inclusion of specified features in health program, by employee size class ¹

Item	Establishments in specified employee size class									
	All establishments	1-249	250-499	500-749	750-999	1,000-1,999	2,000-4,999	5,000-9,999	10,000-19,999	20,000 and over
Number of establishments surveyed.....	2,064	821	467	210	148	236	118	28	26	10
Percent reporting the inclusion of feature										
Features in health program:										
Room(s) equipped for medical examination and emergency treatment.....	73	51	78	90	94	94	95	100	96	100
Preemployment physical examinations of office employees by a doctor.....	48	41	39	51	56	56	79	71	92	70
Preemployment physical examinations of factory employees by a doctor.....	72	65	70	76	78	77	89	96	100	90
Periodic check-up physical examinations of office employees.....	21	17	16	19	22	26	36	32	58	60
Periodic check-up physical examinations of factory employees.....	42	40	36	42	41	40	65	54	81	80
Doctor in the plant at regular scheduled hours.....	32	13	26	34	47	61	83	96	92	80
Registered nurse in the plant at regular scheduled hours.....	42	13	37	63	72	79	91	86	96	80
Health education of employees to prevent ordinary illness.....	39	26	37	46	61	50	64	71	62	80
Records of all illnesses and absences.....	61	50	60	64	78	74	81	89	100	80
Employee mutual benefit association.....	39	22	38	50	56	55	62	79	73	80
Employee hospital insurance.....	54	46	54	59	61	61	70	75	65	70
Program of accident prevention.....	89	84	88	93	93	92	97	96	100	100
Periodic check-up of illumination of work surfaces.....	80	41	48	55	56	62	72	79	73	70

See footnote at end of table.

Table 67.—Percent of surveyed establishments reporting the inclusion of specified features in health program, by employee size class¹—Continued

Item	Establishments in specified employee size class									
	All establishments	1-249	250-499	500-749	750-999	1,000-1,999	2,000-4,999	5,000-9,999	10,000-19,999	20,000 and over
Number of establishments surveyed.....	2,064	821	467	210	148	236	118	28	26	10
	Percent reporting the inclusion of feature									
Features in health program—Continued										
Workroom temperature supervision.....	48	41	46	51	53	58	69	64	54	80
Exhaust ventilation for dust, fumes, or gas control.....	85	80	85	87	91	88	94	93	100	100
Plant housekeeping and sanitation program.....	82	77	80	87	87	86	92	89	96	100
Maintenance of a rest room.....	68	59	70	68	67	79	87	96	72	100
Maintenance of a lunchroom.....	41	25	37	44	58	65	75	71	88	80
Maintenance of a locker room.....	73	72	69	70	72	76	81	89	88	100
Provision for recreational athletic activities.....	52	37	54	60	64	66	79	86	81	90
Fatigue prevention program including:										
Regular rest or relief periods.....	31	21	30	36	41	38	53	39	58	50
Posture chairs or aids.....	32	24	31	34	39	41	46	57	58	70
Refreshments available.....	66	43	63	66	64	67	65	64	54	60

¹ Based on a 1940 survey of 1,500 companies (2,064 plants) in 47 States. With 2 exceptions, not more than 10 percent of the plants were located in any 1 State (New York, 11.3; Pennsylvania, 10.6). About 2,000,000 workers were covered, 5 percent were employed by plants with less than 250 employees and 40 percent by plants with 1,000 or more. More than 17 major industrial groups were represented by the surveyed industries. Less than 10 percent of the plants were in any 1 group except the following: Food and miscellaneous products, 12 percent; machinery and machine tools, 14 percent; metal products, miscellaneous, 16 percent.

Source: National Association of Manufacturers: Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, p. 67.

Table 68.—Percent of surveyed establishments providing specified industrial health services, by size of establishment¹

Item	Establishments in specified employee size class							
	All establishments	Under 500	500-999	1,000-1,499	1,500-1,999	2,000-3,999	4,000-9,999	10,000 and over
Number of establishments surveyed.....	278	43	49	50	17	42	43	34
	Percent providing services							
Dispensary service.....	61.8	46.5	47.0	60.0	53.0	59.5	74.4	94.1
Physical examinations:								
Preplacement.....	72.7	83.7	53.0	62.8	82.3	71.5	72.2	91.1
Periodic.....	60.7	53.2	36.7	60.0	64.7	59.5	67.5	91.1
Return to work.....	65.8	65.0	49.0	64.0	70.6	61.8	67.5	94.1
Exit.....	16.2	11.6	6.1	14.0	17.7	9.5	11.6	52.8
Dental service.....	16.9	7.0	4.1	12.0	11.0	9.5	18.6	53.0
Industrial hygiene engineering service.....	54.0	51.2	36.7	50.0	24.3	47.7	65.0	88.2
Safety and sanitation service.....	64.4	69.8	49.0	57.8	64.7	61.8	65.0	91.2
Safety and health instruction.....	43.5	41.8	34.7	34.0	64.7	40.0	53.5	53.0
Examination information to individual employees:								
Routine report.....	31.3	16.3	18.7	34.0	35.3	30.9	39.6	53.0
On request.....	19.4	34.8	12.5	20.0	23.5	14.3	13.9	20.6
Industrial hygiene information to individual employees:								
Routine.....	5.7			16.6				38.2
On request.....	21.9	13.9	20.0	26.6	23.5	16.7	30.3	23.5

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about 1/4 of whom were women. About 5 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, pp. 33, 35, 40.

Table 69.—Percent of establishments reporting the inclusion of specified features in health programs, by type of industry¹

Type of industry	Percent of establishments reporting specified features																							
	Number of establishments surveyed	Room(s) for medical examination and emergency treatment	Prem-physical examination, by a doctor, of—		Periodic check-up physical examinations of—		Doctor in plant at regular scheduled hours	Registered nurse in plant at regular scheduled hours	Health education of employees to prevent ordinary illness	Records of all illnesses and employee absences	Employee mutual benefit associations	Employee hospital insurance	Program of accident prevention	Periodic check-up of illumination of work surfaces	Work-room temperature supervision	Exhaust ventilation for dust, fumes or gas control	Plant housekeeping and sanitation program	Maintenance of—			Provision for recreational or athletic activities	Fatigue prevention program		
			Office employees	Factory employees	Office employees	Factory employees												Rest room	Luncheon room	Locker room		Regular rest or relief periods	Posture chairs or aids	Refreshments available
All Industries.....	2,064	73	48	72	21	42	42	39	61	39	54	89	50	48	85	82	82	68	41	73	62	31	32	56
Chemicals and their products.....	181	65	52	76	24	52	36	40	51	23	70	87	54	45	84	82	82	70	59	83	87	36	43	54
Electrical products.....	100	80	39	71	15	42	38	50	69	49	61	90	63	68	84	81	81	70	52	65	59	37	43	60
Food and kindred products.....	244	50	64	82	27	63	16	29	69	18	34	94	94	39	80	61	61	70	48	68	65	39	32	47
Iron and steel, heavy.....	182	84	43	82	19	49	37	38	49	41	58	90	43	37	83	83	83	84	48	63	59	29	13	45
Leather and its products.....	57	81	51	65	7	14	18	42	48	25	25	89	61	74	83	88	88	54	39	84	83	18	25	56
Lumber and its products.....	66	61	20	44	9	12	17	21	47	35	53	92	35	41	85	79	79	35	19	31	53	30	11	52
Machinery and machine tools.....	297	77	40	68	15	28	33	46	55	24	54	87	46	48	91	77	77	62	37	71	66	30	31	66
Metal products, miscellaneous.....	324	80	37	73	14	38	48	33	66	42	60	87	46	49	91	77	77	62	37	71	66	30	31	66
Mining and quarrying.....	14	100	79	100	26	57	71	43	36	79	50	100	50	36	79	86	86	57	29	73	70	29	21	34
Paper and its products.....	103	71	50	74	25	39	27	45	61	40	45	93	50	49	84	82	82	70	32	72	62	32	36	23
Petroleum refining.....	31	68	74	87	71	77	45	42	90	45	58	90	83	50	80	71	71	65	32	60	52	32	36	23
Printing and publishing.....	42	71	57	60	14	26	45	60	55	64	76	81	52	55	88	81	86	60	55	60	52	36	36	60
Public utilities.....	26	58	81	85	38	42	35	50	81	58	54	88	50	60	69	62	62	53	53	53	77	33	36	46
Rubber and its products.....	47	94	60	83	23	66	62	77	89	62	74	87	51	72	96	91	91	83	77	89	72	19	30	49
Shipbuilding and other construction.....	18	85	62	69	23	38	38	31	46	31	54	100	62	46	85	62	62	62	38	62	23	8	15	38
Stone, clay, and glass products.....	127	77	66	83	39	58	31	59	72	43	55	95	51	35	89	91	91	65	31	71	62	39	24	35
Textiles and their products.....	156	72	35	48	15	18	26	44	55	30	57	79	69	67	70	76	69	69	49	53	52	26	31	60
Unclassified.....	54	80	55	63	20	48	59	61	80	41	65	89	69	63	89	83	83	69	59	67	74	37	61	66

¹ Based on a 1940 survey of 1,600 companies (2,064 plants) in 47 States. With 2 exceptions, not more than 10 percent of the plants were located in any 1 State (New York, 11.3; Pennsylvania, 10.6). About 2 million workers were covered, 5 percent were employed by plants with less than 250 employees and 40 percent by plants with 5,000 or more. More than 17 major industrial groups were represented by the surveyed industries. Less than 10 percent of the plants were in any 1 group except the following: Food and miscellaneous products, 12 percent; machinery and machine tools 14 percent; metal products, miscellaneous 16 percent.

Source: National Association of Manufacturers; Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, pp. 68-70.

Table 70.—Percent of workers in surveyed plants to whom specified health services are available, by industry or service group ¹

Industry or service group	Number of plants	Number of workers	Percent of workers to whom services are available							
			Hospital care ²	First-aid room	First-aid kit	Trained first-aid worker	Plant physician		Plant nurse	
							Full time	Part time	Full time	Part time
All industries.....	16,803	1,487,224	15.1	51.0	91.3	47.5	15.5	22.3	33.3	1.5
Extraction of minerals.....	548	55,676	34.1	44.5	96.1	82.1	34.7	5.3	20.7	.8
Manufacturing and mechanical industries.....	14,547	1,373,909	14.6	52.4	91.0	46.8	14.6	23.6	35.1	1.5
Chemical and allied.....	1,192	109,387	29.1	58.5	89.7	60.4	27.7	28.4	50.9	1.2
Cigar and tobacco.....	71	14,319	0	69.9	71.2	40.1	0	37.6	45.1	2.7
Clay, glass, and stone.....	1,003	65,863	9.5	46.7	96.0	43.2	3.1	21.7	24.3	.6
Clothing manufacture.....	680	66,417	3.5	31.8	95.0	20.4	0	7.7	8.0	2.3
Food and allied.....	2,669	157,145	3.9	29.1	92.2	33.2	2.3	13.8	14.9	1.1
Iron and steel.....	2,524	383,969	18.4	69.4	92.9	57.9	28.5	25.3	48.4	1.0
Metal industries, except iron and steel.....	890	75,407	19.6	61.2	90.0	54.0	8.7	31.2	40.7	1.3
Leather.....	366	63,021	2.0	51.8	93.5	32.0	.3	6.1	9.2	3.9
Lumber and furniture.....	1,681	93,375	8.9	27.2	92.7	34.3	5.4	13.4	8.8	1.2
Paper and printing.....	1,373	87,030	6.5	43.9	87.2	35.2	3.5	23.3	29.7	1.3
Textile.....	635	117,124	8.8	51.5	89.2	39.6	.9	30.8	36.5	2.7
Miscellaneous manufacturing industries.....	1,463	140,832	30.9	55.8	84.6	60.2	28.0	38.1	54.3	1.5
Transportation.....	790	26,707	11.8	43.7	93.6	48.2	40.6	8.9	4.1	3.2
Personal service.....	918	30,932	1.9	6.9	90.9	14.0	.9	3.4	1.5	.8

¹ Based on a survey of 16,803 plants in 15 States, made under the direction of the Division of Industrial Hygiene, U. S. Public Health Service, during 1936-39. The 1,487,224 workers in the surveyed industries represented 3 percent of all the workers in the United States, 10.3 percent of all the workers in the 15 States furnishing reports, and 39.5 percent of all the workers in the 15 States, but limited to the industries selected for study. Approximately 60 percent of the workers were in plants of 500 or less.

² Company hospital or definite contract with a hospital for care of workers.

Source: Bloomfield, J. J., Trasko, V. M., Sayers, R. R.; Page, R. T., Peyton, M. E.: A Preliminary Survey of the Industrial Hygiene Problem in the United States (Public Health Bull. No. 259). Washington, Government Printing Office, 1940, p. 35.

The Findings of a Survey of Small Plants

This survey was made in order to obtain specific information concerning medical care and sanitary facilities available to employees in industrial establishments located in the Lower East Side Health District of New York City. . . .

The names of 1,122 industrial plants located in the Lower East Side Health District of New York City were obtained from the Industrial Directory of New York State, published by the New York State Department of Labor in 1940. These establishments were visited by New York City Health Department nurses, and the manager or foreman was interviewed about the sanitary facilities and medical care available for employees. The information was obtained for the year 1942. . . .

Of the 1,122 plants visited complete information was obtained from 565, or 50.4 percent. Three hundred and forty-one, 30.3 percent, had gone out of business or moved out of the district in 1942. This great "mortality" among small industries immediately brings up one of the great problems in providing them with medical care and

adequate sanitary facilities. From the employer's point of view it is not worth while to invest money in optimum sanitary facilities and an elaborate health program when there is always the possibility that within a year or two the industry may be forced to move or go out of business.

Sixty-nine, or 6.2 percent of the establishments refused to supply information to the visiting nurses. They stated that they were "too busy," that they were not interested in a health program, or that it was not the health department's business to inquire about such matters. The great majority of employers, however, were interested in the survey and were anxious to discuss plans for providing adequate medical care and for improving sanitary facilities. One hundred and forty-seven, or 13.1 percent of the establishments consisted of contractor firms, that is, small offices with no permanent industrial employees. . . .

Approximately 86 percent of the plants employed less than 50 persons, and 50 percent of the total employees were in plants with less than 250 persons. Four hundred and nine, 72 percent, of the establishments were manufacturing industries. . . . The largest percentage of manufacturing establishments, 24 percent, consisted of plants that made various types of wearing apparel. One hundred and fifty-six, 28 percent, of the establishments were nonmanufacturing industries, and 35 percent of these were concerned with transportation, that is, trucking and garages. . . .

A relatively small proportion of the establishments had sanitary practices that are mentioned only to be condemned. Five industries were found to provide only outside flush toilets, located in the yards in back of the factories. These five outside toilets were located in plants employing less than 50 persons. Nearly half of the industries did not provide hot water in the lavatories. The larger the establishment the smaller was the proportion without hot water, 51 percent in plants employing less than 10 persons, and 9 percent in plants employing over 250. Common drinking cups were found in 21 percent of the establishments. Approximately 20 percent of the plants employing less than 250 persons, while only 9 percent of those employing over 250 had common drinking cups. . . .

One hundred and eleven of the plants studied employed over 10 women, and 60 percent of these provided a rest room for women. Only 7 percent of the plants provided a rest room for men and 22 percent provided a rest room for women. The larger the establishment, the higher was the proportion providing rest rooms. . . .

Only 4.3 percent of the plants gave all the employees pre-employment physical examinations, only 2.7 percent provided annual physical examinations, and only 1 percent took chest X-rays for tuberculosis or serological tests for syphilis. The proportion that did routine pre-employment and annual physical examinations increased as the

size of the establishments increased. So few establishments provided chest X-rays and serological tests that a correlation with size could not be made. Forty-six percent of the establishments which provided health examinations employed company physicians. In 28 percent of the plants providing physical examinations, the examinations were done by union physicians, 24 percent utilized the services of a private physician, and 2 percent availed themselves of health department physicians.

The great majority, 88 percent, of the plants did not have the services of a physician, either full time, part time or on call, and 99 percent of the plants did not have nursing care available. Forty-five percent of the plants with more than 250 employees had the services of a full-time physician and 36 percent had a physician either part time or on call. None of the plants with less than 250 employees had the services of a full-time physician, but from 6 to 22 percent of the smaller plants had a physician on call. Practically none of the plants with less than 250 employees had any nursing service whatsoever, while 64 percent of the plants employing over 250 had a full-time nursing service available.

Ninety-five percent of the establishments provided a first-aid kit for employees, and the percentage providing first-aid kits rose as the size of the establishment increased. Of the plants employing less than 10 persons, 90 percent provided a first-aid kit, while in the plants employing over 250, 100 percent provided a first-aid kit. Only 4 percent of the plants provided an infirmary. The percentage providing an infirmary rose as the size of the plant increased. In the plants employing less than 10 persons 0.6 percent provided an infirmary, while in the plants employing over 250, 55 percent provided an infirmary. There was not any significant relationship between the industrial classification and whether or not a first-aid kit and room were provided. . . .

Fourteen percent of the 565 establishments provided some form of sick benefit plan. The proportion increased as the size of the plant increased. Six percent of those employing less than 10 persons and 56 percent of those employing over 250 had a sick benefit plan. The majority of the plans were ones in which the employee alone contributed or where there was a joint contribution of employer and employee. Rarely was the plan financed solely by the employer. The larger the plant, the higher was the proportion of sick benefit plans which were joint contributions of employer and employee. There were many types of sick benefit plans. In the smaller establishments the majority of the plans were organized by the union, and the employer contributed 1 to 2 percent of the total cost. The larger establishments had company plans in which the employee usually contributed 50 percent of the total. In 19 establishments the em-

ployees belonged to the Associated Hospital Plan on the group basis. These were financed completely by the employees. . . .

Only 27 percent of the establishments studied kept absentee records of illness. The proportion that kept records increased as the number of employees increased from 15 percent in plants employing less than 10 persons to 64 percent in plants employing over 250.

Quoted from Kresky, Beatrice, and Rosenthal, Theodore: "A Survey of Medical and Sanitary Facilities in Small Industrial Establishments." *Journal of Industrial Hygiene and Toxicology*, 26: 201-204 (June) 1944.

In-Plant Medical Services by Prepayment Medical Care Plans

Because medical experts all agree that preventive medicine is the cornerstone of any positive health program, because experience has proved that few individuals will go to a doctor for routine health examinations and so the doctor must be brought to the individual, and because insurance, while relieving the financial burdens of sickness, does not embrace a sound program of preventive care, Group Health Insurance, Inc., has established a Committee on Employee Health Services to act in an advisory capacity to employers.

This committee, without charge or obligation, will meet with Group Health Insurance subscribers to give advice about the formation of employee health service programs or to offer guidance for programs already in operation. . . .

A well-rounded preventive medical program should be shaped to fit the special needs of your own organization. It should include all or some of the following:

1. Preplacement and periodic physical examinations.
2. Immunizations.
3. Supervision of first-aid facilities and practices.
4. Health counseling and education.
5. Recommendations for employment suited to physical capacities.
6. Supervision of environmental sanitation (light, ventilation, hazards, etc.).
7. Handling of Workmen's Compensation cases, and, when requested, treatment of occupational injuries and diseases.
8. Cooperation with Group Health participating physicians.
9. Maintenance and study of sickness and absence records.
10. Advice to employer on all matters relating to employee health.

The Group Health Committee is prepared to consult with employers as to the type of employee health program best suited for each need; it will provide estimates of cost, needed personnel, equipment and space. The committee is also in a position to assist in securing qualified medical personnel, on a part-time or full-time basis, and, when desired, could take responsibility for supervision and direction of an employee health service program.

The consultive and advisory service of this committee is offered to you without charge as a Group Health subscriber. We hope you will decide to take advantage of it.

Quoted from: Group Health Insurance, Inc., A Health Service Plan, New York, 1950. (Processed.)

In St. Louis, the Retail and Wholesale Union attempts to bring the advantages of the Labor Health Institute to attention of its members through health education pamphlets, a health column in the union newspaper, and forums under the auspices of health and safety shop councils at work places. To a limited extent, the institute has provided in-plant medical services, such as mass inoculation against influenza. In some instances, employers use the institute for pre-hiring physical examinations. It is planned eventually to widen this phase of medical service so that the Labor Health Institute will staff the medical departments of contributing employers.

Quoted from: Department of Labor, Bureau of Labor Statistics: Employee Benefit Plans Under Collective Bargaining (Bull. No. 946). Washington, D. C. Government Printing Office, 1948, pages 11-12.

Plant Environmental Health Services

Appraisal and Control of Industrial Health Hazards

The control of occupational diseases lies chiefly within the sphere of two types of workers, the physician and the engineer. It is within the province of the physician to diagnose occupational diseases and primarily to recognize the existence of those diseases due to the factory environment. Based on the findings of the physician, the engineer is in a position to learn where control measures are to be initiated. His functions are twofold: First, he must study the local plant conditions which have been shown to be detrimental to health and by precise quantitative measurements determine the extent of the hazard; second, once the nature and degree of the hazard have been demonstrated, the engineer must consider ways and means for controlling or minimizing the dangerous condition and for studying the effectiveness of these measures.

Quoted from Bloomfield, J. J.: "Engineering Control of Occupational Diseases." *Public Health Reports*, 51: 655 (May 22) 1936.

If we examine the literature on industrial hygiene, we are confronted with the fact that methods employed in the study of the effect of industrial health hazards differ but little from those used in investigations of other phases of public health. This is not strange, since in the studies of industrial diseases it is essential, as in communicable disease investigations, to determine the etiology, pathology, symptomatology, and the application of measures to prevent or control the disease. One may therefore employ the term "industrial epidemiology" when referring to the methods used for the investigation of diseases occurring in industry or among industrial workers, and the subsequent determination of methods of prevention or control of such diseases. . . .

One of the functions of an engineer in the field of industrial hygiene is the study of the workroom environment in an effort to determine any relationship between that environment and its effect on the health of the worker. In all such investigations there are certain preliminary steps of fundamental importance which must be undertaken in order to serve as a guide in the more detailed studies which may be indicated. These preliminary steps are the basis for the reconnaissance survey and consist of the sanitary appraisal and the occupational analysis of the workroom and its inhabitants. . . .

The sanitary survey of the workroom consists in noting items of a general sanitary and hygienic nature, such as provisions for ventilation,

illumination, fire protection, accident protection, exposure to specific poisons, such as dusts, fumes, vapors, and gases, fatigue, and so on. In other words, sanitary survey yields information concerning the presence of various health hazards and serves as a guide in determining which hazards require further detailed study in the nature of actual quantitative determinations. One should look upon this type of survey as a listing of the facilities afforded the worker while in the industrial environment and may be likened to the inventory of materials in stock which a business establishment usually undergoes periodically.

The occupational analysis, which is also a part of this inventory or reconnaissance survey, permits one to learn of the activities involved, the particular hazards associated with each occupation, and the number of persons in each occupation.

In determining a worker's exposure to materials or conditions incident to his employment, it is necessary to have precise data on such exposures. In some cases the difference between a hazardous and a nonhazardous condition may depend entirely on whether the worker is exposed continuously to concentrations of materials bordering on the threshold limit. For example, in the case of exposure to certain lead compounds, for which the threshold limit has been set as 1.5 milligrams per 10 cubic meters of air, it is very important to know whether the worker is inhaling lead dust approximately above or below this limit. Quite often a difference of a milligram or so may spell the difference between a safe or an unsafe condition.

Detailed appraisals of exposure may be said to serve a threefold purpose. First, they enable one to determine the extent of a hazard. This is accomplished by obtaining occupational exposures, by precise methods, to the toxic materials or conditions under consideration. Today, the engineer and chemist have at their disposal delicate instruments and methods of analysis unprecedented in the history of industrial hygiene and our knowledge concerning such matters is increasing from day to day. The guesswork as to actual exposures has been fairly well taken out of industrial hygiene.

A second purpose served by the detailed study is the fact that if clinical investigations are made concurrently with environmental studies, the findings on occupational exposure may indicate the permissible amounts of the toxic materials which may be tolerated with safety.

And, finally, the third purpose served by this type of study deals with the control of the hazard. In other words, one is in a position to determine the efficiency of any device which may have been introduced for the minimization or elimination of the hazard. . . .

No set rules may be established for the mechanical protection to be instituted in an attempt to control an industrial health hazard. Specific conditions encountered in a plant will determine the type of

protection to be employed. In general, however, there are five methods which may be attempted in the minimization of an industrial exposure. These are : (1) Substitution of a nontoxic material for the toxic one, (2) isolation of the harmful process, (3) wet methods in the case of some dusty operations, (4) local exhaust ventilation, and (5) respiratory protection. In many instances it may be necessary to employ a combination of the above methods in the control of a single exposure.

Quoted from Bloomfield, J. J.: "Methods Employed in the Appraisal and Control of Industrial Health Hazards." *The Medical Clinics of North America*, 26: 1162-1167 (July) 1942.

Measures for preventing the inhalation of excessively contaminated air have been discussed by many authors, and there are about as many different classifications of these methods as there are papers on the subject. The principles expounded, however, are always essentially the same. They may be divided conveniently into three main groups as follows, depending upon the avenue of approach:

1. Eliminating the sources of contamination or reducing the amount.
 - a. Building and equipment design, alteration, and maintenance.
 - b. Substitution of less toxic materials.
 - c. Process of operation changes.
 - d. Housekeeping.
2. Prevention of contaminant dispersion.
 - a. Segregation of hazardous processes.
 - b. Enclosing the hazardous processes.
 - c. Wet methods.
 - d. Local exhaust ventilation.
 - e. Equipment maintenance.
 - f. Worker education.
 - g. Housekeeping.
3. Protecting the worker.
 - a. Equipment alteration.
 - b. General ventilation.
 - c. Respirators.
 - d. Worker education.

The control of an atmospheric health hazard is rarely accomplished by a single measure; it usually involves the use of a combination of methods.

Quoted from Brandt, Allen D.: *Industrial Health Engineering*. New York, John Wiley & Sons, Inc., 1947, page 50.

Plant Industrial Hygiene Studies

The location, identification, and control of unhealthful occupational exposures is a primary function of the industrial physician. Technically, an exposure is defined as any working condition or environment, process, operation or material used in manufacturing which is capable of causing harmful physical effects. These may, on occasion,

be so obvious that workers themselves are perfectly familiar with their source. Most frequently periodic physical examination of employees will prove to be the most sensitive index of the effect on workmen of industrial exposure and inadequacy of control measures. Elsewhere, discovery requires diligent combined effort by highly trained medical and engineering personnel. In any case, systematic methods are essential in order that dependable data may be secured on which a program of adequate control can be based. Plant hygiene studies have proved to be reliable and to require least expenditure in time and money. The procedure is essentially one of taking periodic inventory of unsatisfactory occupational risk.

LOCATION OF EXPOSURES. Experience in large and small industrial establishments suggests that plant hygiene studies are likely to be most successful if certain steps are followed:

1. A complete list of all materials used in manufacture should be secured. Those capable or suspected of causing trouble should be suitably indicated on the list.

2. All steps in manufacture should be described, preferably in the form of a diagram or schematic representation, to indicate the flow of goods from raw material to finished product.

3. Thorough inspection of the working premises is essential to test conclusions drawn from the inventory of materials and processes and to evaluate other conditions of work which are potential contributors to disability and lowered production. It must not be forgotten that harmless substances may under certain conditions or in susceptible individuals become harmful. In the same way, no matter how much care has been expended in preliminary investigation, additional or unsuspected sources of exposure will be missed unless every aspect of the working environment is carefully scrutinized.

4. A record should be made of every material, process or environment capable or suspected of causing injury or disease, the exact location of each, and the number of workers exposed.

ENGINEERING STUDIES. Following location and identification, the physician should indicate in the record his estimate of the seriousness of each exposure. If doubt exists about its exact nature or satisfactory control, assistance is needed from an industrial hygiene engineer. In fact, confirmation about the severity of most exposures is often highly desirable and it is routine practice in many manufacturing concerns for an engineer with suitable qualifications to verify all preliminary estimates. Qualitative and quantitative analyses of each exposure are available in this way for use as factual evidence if necessary. All determinations of this character should be suitably entered in the records.

CONTROL OF EXPOSURES. As soon as the industrial physician has established a source of occupational disability he must set the machinery in motion for adequate control. . . .

NEW PROCESSES. All new processes, materials or modifications of old ones should be investigated in much the same way and in advance of installation to prevent the introduction of unexpected exposures.

MAINTENANCE OF CONTROL. Plant medical inspections are an essential phase of control maintenance and consequently of the industrial physician's routine. These inspections should occur periodically. Sites of greatest exposures need frequent attention, possibly constantly repeated chemical and engineering evaluation. Others are visited in relation to their importance. Periodic plant walks by the medical department personnel throughout the entire establishment is particularly sound practice. Occasionally, inspections should be made in company with officers of the firm, particularly those responsible for production, personnel, plant conditions and safety. Active interest and cooperation from management is quite as great an element of successful medical department administration as cooperation from the workmen. Employees most emphatically need instruction and regular supervision in order that adequate understanding may exist about the continuous and proper use of protective devices.

The record system of the medical department should contain copies of recommendations leading to the installation of control measures, the date of installation and the dates of any special notations about follow-up visits and inspections. Forms can readily be devised which will facilitate the uniform recording of all results of plant inspection.

Medical inspection has additional advantages. It provides opportunity for thorough familiarity with every job in the plant. Information of this character is of the greatest usefulness in relating work assignments to the physical and temperamental qualifications of workmen. It is reassuring to employees to know that plant conditions are under observation by medical personnel. It is equally satisfactory to employers to realize that proper records are available in case claims arise out of alleged unhealthful conditions of work.

Quoted from American Medical Association, The Council on Industrial Health: "Medical Service in Industry: Plant Hygiene Studies." *Journal of the American Medical Association*. 118: 818-819 (March 7) 1942.

Types of Plant Environmental Health Programs

Only the largest industrial concerns have full-time industrial hygiene engineers and chemists with laboratory and field equipment. In many more concerns the accident prevention department is charged with control of occupational disease hazards. In still others the engineering department has the responsibility to install operations

so that the exposure to potentially injurious materials may be minimized. Where harmful gases or vapors are evolved in processes such as in viscose rayon manufacturing, the chemical laboratory may make routine checks of extent of exposures and report their findings to the management.

The system followed in some concerns where there are several separate departments or plants is to place an industrial hygiene service on call when, as and if the superintendent of that unit makes a formal request. This system has the advantage of encouraging the superintendent's cooperative interest in whatever preventive suggestions may be made as a result of the industrial hygienist's survey, but it has its disadvantage of insufficient contact with potential hazards, which can be more effectively handled by a more direct system with retention of the superintendent's cooperative spirit through demonstrated practical work on the part of the industrial hygienist.

A preferable method is one which is at present proving its value in industry. The industrial hygiene engineer is available to any of the plant superintendents on call. But his work does not begin and end there. He is kept continually informed by the purchasing department on potentially injurious materials coming into the plants. He knows where these materials go and what becomes of them. He has a record of potentially harmful processes being conducted with a schedule to check these at proper intervals. He makes general surveys at regular periods, since industrial operations are always in a state of change.

Quoted from Cook, Warren A.: "The Industrial Hygiene Engineer." Proceedings of the Third Annual Congress on Industrial Health, Chicago, January 13-14, 1941. Chicago, The American Medical Association, pages 20-21.

Table 71.—Number and percent of establishments including specified features in industrial hygiene programs¹

Item	Number of establishments	Percent of 158 establishments
Industrial hygiene programs maintained.....	158	100
Industrial hygiene programs include responsibility for control of:		
Noise.....	103	65.2
Dust.....	149	94.3
Ventilation.....	152	96.2
Illumination.....	141	89.2
Heating.....	135	85.4
Water supply.....	127	80.4
General sanitary conditions.....	155	98.1
Housekeeping.....	140	88.6
Exposures to toxic substances.....	142	89.9
Milk supply for cafeteria.....	74	46.8
Nuisance complaints (odors, etc.).....	131	82.9
Dermatitis.....	147	93.0

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent, 5,000 or more. More than 90 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

² Represents 47.4 percent of 333 plans included in survey.

Source: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy No. 96). New York, National Industrial Conference Board, Inc., 1948, p. 34.

Environmental Health Programs of Very Large Companies

Services offered. A general list of the services of the [industrial hygiene] Department follows, with brief individual explanatory notes on each service.

1. *Chemical evaluation of the environment.* This service consists of sampling and analyzing the kind and amount of atmospheric contamination such as gases, vapors, mists, fumes, or dust. For routine environmental control work we prefer analytical methods that give results in the field over methods requiring laboratory evaluation. Where the purpose of a survey is only to develop satisfactory control measures we may do very little analytical testing. . . .

2. *Physical evaluation of the environment.* (a) Radioactivity: Exposures to X-rays, gamma rays, and radioactive materials, as in some luminous paints, are measured and evaluated. (b) Other radiant energy: Infra-red and ultra-violet rays are measured and evaluated. (c) Lighting: General plant lighting and job lighting are compared with accepted lighting practices and effective lighting systems in use in other Divisions. (d) Noise: The loudness of noise is measured in decibels, frequencies are analyzed, and advice is given regarding probable effects upon employees. (e) Temperature and humidity: Abnormal temperatures and humidities are studied with a view toward correction.

3. *Control measures.* Whenever any questionable or unfavorable environmental condition is found as a result of our surveys or is reported by a Division, we offer suggestions or recommendations for a method or alternative methods of control.

4. *Analysis of materials.* (a) Biological specimens are analyzed for possible toxic materials. Many urine specimens from persons with potential exposures to lead or fluorides are analyzed to determine the over-all exposure of individuals. This method may be used instead of air analyses, or to supplement air analyses in the evaluating of plant exposures. (b) Raw materials, intermediates, by-products or products are analyzed, when necessary, to determine their hazardous or potentially hazardous nature. Solvents of unknown composition are always under suspicion when used in open containers or dispersed in workroom atmospheres.

5. *Dermatitis.* Minor or obvious causes of dermatitis are pointed out and corrective measures suggested. The Central Office Health Maintenance Staff and the Industrial Hygiene Department are prepared to make joint studies, in collaboration with Division Medical Departments, concerning Division dermatitis problems. Studies of this nature in the past have been helpful in determining the cause or causes of cases of dermatitis and in establishing satisfactory controls.

6. *Ventilation.* Our ventilation service includes consultation with the divisional ventilating engineer or ventilating contractor regarding air volume or velocity; air cleaning; hood or booth design and loca-

tion; make-up air; and other factors pertaining to process or general ventilation, for health and comfort. Efficiency tests are made on air cleaners such as air washers, filters, precipitators, and cyclones. Particular attention is paid to situations where the air is recirculated, or where recirculation of air would be desirable. The Industrial Hygiene Department reviews plans for proposed ventilation of present buildings, or for new construction. Opinions are rendered as to the efficiency and suitability of planned ventilation and suggestions are given regarding improvements or changes.

7. *Respiratory protective apparatus.* All respirators are considered a temporary expedient, and their continuous use is discouraged except in unusual circumstances. The Industrial Hygiene Department makes atmospheric pollution studies and submits recommendations on personal respiratory protection. These studies include careful observation of the operation, the use of any respiratory protection equipment, and recommendations based upon findings.

8. *Sanitation.* We do not stress sanitation as a part of our service but do point out, with control suggestions, any rather obvious departures from generally accepted practices in sanitation, including plumbing cross connections. . . .

9. *Personnel service.* The Industrial Hygiene Department is in a particularly advantageous position to assist the Divisions in selecting personnel for industrial hygiene work. Requests for personnel are given consideration and attention, aimed at securing the best and highest type applicants for each particular job.

Quoted from Patty. Frank A.: "General Motors Industrial Hygiene Services." American Industrial Hygiene Association Quarterly, 7: 5-7 (September) 1946.

The present Industrial Hygiene Department was organized to serve all domestic primary-producing divisions of the corporation. It is a separate and distinct department maintaining equal relationships with all divisions regardless of size or location. . . . In general, our responsibility is the working environment with relation to its effect on the worker. Factors contributing to the entity comprise dusts, fumes, vapors, gases, toxic materials, heat and humidity, noise and vibration. Functions of the department may be classified according to the definition of industrial hygiene appearing above; i. e., fact finding (recognition), evaluation and coordination, and prevention (control) as follows:

Fact finding comprises plant surveys and the usual chemical and physical procedures for the quantitative evaluation of the working environment. Except in emergencies, samples other than for dust counting are forwarded to headquarters for analysis, and reports of findings are submitted to all interested persons. Routinely-used equipment is maintained at headquarters and at the southwest laboratory; special apparatus is located at the home office and made available where needed.

Dusts of various types are the atmospheric contaminants most commonly encountered in the various plants; however, carbon monoxide, carbon disulphide, sulphur dioxide, sulphur trioxide, lead and other metal fumes, organic sulfur compounds, higher alcohols, solvents, radiant heat, high humidity, noise and vibration, while of lesser importance, are nonetheless present in certain instances and require study.

As a matter of common sense, certain analyses requiring expensive equipment or highly specialized training are contracted out to other laboratories, i. e., X-ray diffraction and spectrographic analyses. Certain types of research involving animal experimentation have been turned over to the medical school of a nearby university with which a close relationship is maintained.

Evaluation and coordination are the administrative phases of industrial hygiene, involving (a) the correlation of environmental findings with data on the physical condition of groups of employees, (b) the evaluation of the environment in the light of available facts and (c) the coordination of preventive measures.

As an engineering organization we work cooperatively with, and in an advisory capacity to, local medical departments, which are responsible for all medical work. We give them copies of all reports and full information as to plant conditions. In return the medical staffs furnish reports of findings from their preemployment and follow-up examinations, limited, however, to conditions having industrial implications. Occasionally special examinations of groups of employees are suggested by the Industrial Hygiene Department.

We prepare and analyze statistical data on health and the environment, and to this end central records, particularly on chest X-ray interpretations and occupational histories, are maintained at headquarters. . . .

Once all facts are assembled and correlated, an evaluation of the environment may be made and the need for preventive measures determined. Very frequently comfort, rather than any health hazard, is the basis for recommending plant improvements.

Coordination of preventive measures usually entails conferences with operating and maintenance officials, or, in some cases, top management, at which the most effective and economical improvements are mutually agreed upon. This approach eliminates cross-purposes and insures the cooperation of all interested parties. It also makes available to the solution of a given problem the sum total—such as it is—of our experience at all plants of the corporation. On rare occasions a situation is encountered where engineering methods of control are, for various reasons, not possible. In such cases, medical staffs are contacted so that preventive medical procedures may be inaugurated for the protection of those exposed.

Prevention or control of potentially harmful environmental conditions is our major objective and no project is considered completed until effective control measures are in operation. The approach to a given problem is worked out—often experimentally—with proper officials by the field engineers, except that where ventilation is required the job is referred to headquarters. Drawings of new construction are also furnished to us in order to permit advance planning of health protective measures. Our ventilation design section prepares complete general arrangement drawings and specifications for such local or general exhaust, air supply and air-conditioning systems as may be required in the various plants. Detailing is done by local engineering departments, who have available sample plates of standard details furnished by our department. Construction is also the responsibility of local officials with the advisory assistance of the industrial hygiene engineers. . . .

Occasionally the Industrial Hygiene Department is requested to undertake a special project by one of the divisions, usually involving atmospheric pollution or meteorological studies for plant site selection. Properly-qualified personnel is retained on a temporary basis in such instances.

Safety hazards coming to our attention during our plant inspections are referred to the safety engineers with whom close relationships are maintained.

Quoted from Pring, R. T.: "Industrial Hygiene at Kennebecott." *American Industrial Hygiene Association Quarterly*, 10: 89-92 (December) 1949.

Basically, our program is twofold: correcting conditions that already may exist, and preventing the occurrence of new, undesirable situations when processes are changed or new processes are developed and installed. Attached to this main program are a number of other areas of service to be referred to later.

We are in an advantageous position since we can follow the development of new chemicals in the research laboratory. As the nature of these chemicals unfolds and as plans are laid for prepilot and pilot plant construction, industrial hygiene enters the picture. We take the information that is being gathered in animal toxicological studies and apply the necessary environmental control to the blueprints of the new process. This is true preventive industrial hygiene. The experience gained in following pilot plant operations is transposed to the blueprints for the complete production plant. Protection of employee health is thus secured in advance. In addition, particularly where toxic substances are to be produced, we attend the start of such new processes to look for potential hazards.

Our programs in various plants are usually headed by engineers who carry out the design and installation of corrective measures under the direction and advices of the central office industrial hygiene group. Under these men, in turn, are draftsmen, who prepare completed con-

trol plans. Their work is built around our periodic plant-wide industrial hygiene surveys and special investigations. Each plant program is sufficiently flexible that any need that arises may be brought under it for control. Periodically, progress reports are published for management review.

It is our aim to establish an annual operating budget for each plant's industrial hygiene program. With a budget plan, work can be accomplished with more speed than under a system of obtaining an appropriation for each item. Furthermore, responsibility is centralized and flexibility is insured. A valuable aid to such a program is a definite allocation of maintenance and construction man hours to install the improvements.

Problems in air pollution prevention fall directly upon the industrial hygienist. His trace sampling and analytical determinations are needed for gathering factual data regarding new or existing processes. An important consideration of any new process is its potentiality for atmospheric pollution. When potential pollution exists the adoption of process changes may reduce or even eliminate it entirely. It may be necessary to resort to condensing, trapping or scrubbing to avoid pollution. . . .

There are many small laboratories for process control in a chemical plant. We find that the chemists are extremely interested in the rapid micro techniques of the industrial hygienist for sampling and analysis. They save both time and cost but more important from our viewpoint, are the changes that have occurred in the methods of obtaining samples. With these micro tests a few milliliters of the substance will be sufficient for analysis and it is no longer necessary to obtain a 1 or 2 liter sample. . . .

We have occasion to translate the information from the toxicologist's notebook into terms more readily understandable by plant supervisors and employees. Our translations develop into publications that outline safe working procedures. These publications, in turn, have been used in job training, particularly when the more toxic substances are involved.

In a few of our plants it has not been necessary to maintain a full-time personnel under the industrial hygiene program. Periodic surveys suffice, but between times, the plant manager or an engineer serve as our liaison representative in matters of industrial hygiene. They advise us of changes to be made or of environmental problems that arise. It is their habit to submit blueprints of proposals for our review. We feel that we are only on the other end of the telephone from any person in any of our plants, and in actual practice this certainly is the situation. These frequent calls extend our usefulness and make it possible for us to be of immediate aid; a situation that does not exist where a formalized approach is demanded.

We are in constant touch with the company's central engineering department, particularly the ventilation and air-conditioning section. They have established a review procedure covering industrial hygiene and including sanitation, general ventilation and illumination. The central office process development engineers confer with us on new processes so that the proper measures for maintaining a satisfactory working environment for our employees can be designed at the blueprints stage.

Our contact with the central safety department and plant safety groups is also continuous. The two fields of safety and hygiene are, as you know, very closely connected but we have a definite division of responsibility between them. The two fields are very close in recommendations dealing with personal protective equipment. The industrial hygienist assumes direct responsibility in the matter of recommending the type of respiratory protection. However, both groups recommend protective clothing, including goggles, where the need occurs in their particular area of responsibility.

On occasion we have worked closely with the legal department of the company in providing factual data and information for their use and guidance in the consideration of industrial hygiene matters.

It is through this cooperation with and by the various company-wide groups that practical and worthwhile accomplishments have been made. This cooperation in a large measure serves as the basis of our educational program; it has given us the chance to point out the needs and opportunities in the field of industrial hygiene to many persons who do not as a rule come in direct contact with the man on the plant operating floor.

Our cooperation with the various sales groups and their technical service representatives has brought us gratifying experiences. We discuss problems with them concerning the use and handling of our products by customers and, not infrequently, travel with them to our customers' plants. The excellent reception accorded us by our customers points to their concern for maintaining the health and safety of their own employees. Occasionally, it has been possible to allay unfounded fears and misgivings on the part of others and it has been a pleasure to see our suggestions and recommendations acted upon and improvements made in their work places.

Quoted from Bradley, W. R., and Hamblin, D. O.: "The Industrial Hygiene Program of the American Cyanamid Co." *American Industrial Hygiene Association Quarterly*, 10: 61-68 (September) 1949.

Plant Dental Services

Basic Principles of Plant Dental Services

Dental service in industry, like other branches of industrial medicine, falls naturally into two main categories—occupational and non-occupational. The former is, of course, the first concern of industry, but the latter has so many claims upon industry that it cannot be neglected. In effect the nonoccupational work is public-health dentistry for industrial workers. It comprises perhaps 95 percent of the dental need of the industrial worker, unless further research on occupational dental hazards should show that field to be larger than it is thought to be at present.

Public-health dentistry might normally be considered to be the function of governmental agencies, but there are several reasons why the participation of industry is both logical and necessary. These are: (1) Industry stands directly to gain by the dental health of the worker; (2) a strong trend of public opinion now exists toward making industry responsible for many forms of welfare work; (3) the fact that workers are gathered daily by industry in one place and with common interest gives industry a strategic advantage in certain types of health service which governmental agencies could duplicate only with difficulty; and (4) governmental agencies are fairly well agreed that as money becomes available for dental service it should be spent first for preventive work among children. Since adequate service for children can more than absorb all the money and professional personnel likely to be available for a long time, it is safe to assume that the extension of Government service for adults will be slow.

Quoted from Dunning, James M.: "Public Health Aspects of Dental Service in Industry." *Industrial Hygiene Newsletter*, 7: 4 (November) 1947.

Essentials of an Industrial Dental Service

1. The industrial establishment shall have an organized dental service, as further specified, with a competent staff including consultants and with adequate facilities to insure efficient care of all employees who need palliative emergency dental treatment because of occupational injuries or who have developed oral manifestations of occupational disease.

2. The dental department shall urge all employees to obtain necessary dental treatment and shall devote a portion of its time to educating them in the value of maintaining oral health.

3. The industrial establishment shall require thorough mouth examination of all persons entering employment. There shall be a system of complete and accurate records, filed in an accessible manner

and available to the employee, to medical and dental services, and to Government agencies for identification purposes. In setting up the records to be maintained, the division of dental hygiene of the State department of health should be consulted in order that a uniform system of dental records may be developed that will make possible valuable statistical analyses and comparisons.

4. Membership on the dental staff shall be restricted to dentists who are (a) in good standing with the local dental society, and (b) qualified in such fields as may be included within the service.

5. The dental department or service shall have complete responsibility for the dental personnel as to the quality of service rendered.

6. Industrial dentists should be familiar with the industrial processes and watch closely for evidence of oral disease caused by such poisons as mercury, lead, phosphorus, fluorine, acids, and radioactive materials, and of other chemical or physical hazards. Immediately upon noting any oral evidence of occupational disease, other units in the industrial establishment, such as the medical department or safety engineering department, should be notified, to the end that cooperative study and action may be undertaken.

7. The industrial dental service shall limit itself to the services specifically mentioned above. X-ray and prophylactic services in newly established industrial dental programs, however, and all details (not included in pars. 1 through 6) of services in operation at the time of the adoption of these rules shall require merely the approval of the State dental society.

Quoted from American Dental Association, Committee on Dental Economics: "Dental Service in Industry." *Journal of the American Dental Association*, 29: 300-301 (February) 1942.

Steps in Initiating an Industrial Dental Service

1. Make an initial survey of dental needs and facilities.

2. If dental needs are definite, install an examination service in accordance with American Dental Association standards.

3. As a result of the findings under this procedure, establish additional dental services along the lines of prophylaxis and treatment to the limit of the interest of the employer and the sanction of the State or local dental society.

4. Survey the industry for possible occupational hazards, noting any significant findings at the time of examination and investigating the cause, in cooperation with those responsible for the other phases of industrial hygiene in the company. . . .

5. Give attention to the amount of dental service available to employees' families . . . and be prepared to cooperate with local and State dental societies . . . in initiating the establishment of any needed new private dental offices and clinic facilities in the community.

Quoted from Dunning, James M.: "Steps in the Initiation of an Industrial Dental Service." *Journal of the American Dental Association*, 29: 1523-1527 (August) 1942.

Extent of Dental Programs in Industry

While the value of dental services is generally recognized, it has not been introduced into industry to any appreciable extent. A study of 1,546 industrial dispensaries made by the American College of Surgeons showed that 10 percent of those plants having 1,000 or more employees had provided dental service as compared with 1 percent in plants having less than 500 workers. Dental services in industry increased as the size class of industries increased. Among plants having 5,000 to over 10,000 employees, 17 percent provided dental services. The reasons for this comparatively negligible utilization of dental service by industry are:

1. The occasions for dental care are relatively rare from the standpoint of compensation requirements.

2. Industrial authorities believe that it is more economical for the employer to have the plant physician give a superficial dental examination along with the routine physical examination, and to refer all employees as indicated to their own private dentists.

In a study of dental clinics of 59 companies made by the Division of Hygiene of the Pennsylvania Department of Labor and Industry, it was found that the average cost of equipping a dental clinic was \$1,958.03 with a minimum cost of \$329.29 and a maximum cost of \$8,000. The average annual cost of operating the clinic was \$3.38 per employee.

Each industrial organization should designate one or more competent dentists to treat employees who receive dental injuries and who do not have a competent dentist of their own choice. For the relatively few dental injuries that occur in the line of duty it is inadvisable to set up dental facilities in the plant. Adequate dental service for such injuries can be obtained on the outside at less cost.

Many of the dental departments in industry were introduced primarily as preventive dental and health measures. In such instances the employer provided the space, equipment, and supplies, and paid the dentist a salary for service rendered. Employees would receive free examinations, advice, and prophylactic work at routine intervals varying from 6 months to 2 or 3 years, and in special cases as indicated. For further dental care the employee would be referred to his own dentist. . . .

Some organizations permit their employees to have dental work done on company time while others charge all excess time over a maximum allowance to the employee. A few industrial dental departments are completely equipped and render any dental service that may be needed. The average industrial dental department, however, does not include the making of inlays, bridges, and plates since the employer does not want to assume the responsibility for

the problems and difficulties that may accompany such extended work.

Oral hygienists are used by some organizations such as department stores, insurance companies, banks, public utility companies, and others. The work of the oral hygienists should have adequate supervision by a dentist.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, pages 9-10.

Table 72.—Scope of dental services reported by companies during 2 surveys ¹

Item	Companies surveyed by—	
	American Dental Association	First District Dental Society and Metropolitan Life
Total surveyed.....	841	628
Number replying.....	498	371
Number reporting dental service.....	116	47
Number reporting specified type of service:		
(a) Chiefly examination and prophylaxis (19 optional, 25 compulsory, 5 doubtful).....	33	16
Visual inspection by a physician.....	14	3
Explorer and/or X-ray examination.....	12	4
Periodic examinations (1 includes periodontia).....	0	3
Periodic examinations+periodic prophylaxis.....	3	2
Periodic examinations+periodic prophylaxis+X-ray examinations+emergency first aid and consultation.....	3	3
Periodic prophylaxis.....	1	1
(b) Limited treatment service (31 optional, 1 compulsory, 3 doubtful).....	24	11
Periodic examination+extraction service.....	7	4
Periodic examination+periodic prophylaxis+extraction service+emergencies.....	12	3
Examination and/or prophylaxis+filling work.....	0	3
Prophylaxis+extractions+children's service.....	1	1
Oral surgery, re focal infection and/or injury.....	4	0
(c) Fairly broad treatment service (37 optional, 3 compulsory).....	56	14
Periodic examination+periodic prophylaxis+fillings, prosthesis and surgery, with only minor limitations.....	20	8
The same, less prosthesis.....	8	4
The same, but only when due to injury.....	28	2

¹ Based on studies undertaken independently of each other within the 2-year period 1939-41. Companies contacted by the American Dental Association were those with medical services approved by the American College of Surgeons and included companies with less than 500 employees as well as larger groups. The second study was made by the First District Dental Society of New York with the cooperation of the Metropolitan Life Insurance Co. Only companies with 500 or more employees were contacted. Nineteen dental services reported are common to both studies.

Source: Dunning, James M., Walls, R. M., and Lewis, Samuel R.: "Dental Economics: Prevalence and Characteristics of Dental Service in Industry." *The Journal of the American Dental Association*, 28:492-501 (March) 1941.

Dental Services in Small Plants

Small plant employees as well as those in large plants need certain dental services and the problem is the choice of a method that will make these services available. Several methods follow, many of which are now being used by plants; the choice may be one or a combination of these methods:

1. Several plants collectively employing the full-time services of a dentist operating part time in an office in each of the plants or in a central clinic to which all employees are referred.

2. A plant employing a definite portion of a dentist's time for service, either in the plant office or his private office.

3. A plant supplying office space and equipment for use by a dentist who conducts a private practice made up of the plant's employees.

4. A group of private dentists arranging, with a plant or group of plants, to supply diagnostic service, the employee being referred for service to his own dentist or to this panel of dentists.

5. A number of small plants, scattered over a wide area employing the services of a dentist who operates in a mobile dental office or with portable equipment, thus taking dental services to the workers at the various plants.

Quoted from Heacock, Lyman D.: "Dental Services." *Manual of Industrial Hygiene* (Edited by William M. Gafafer). Philadelphia, W. B. Saunders Co., 1943, page 96.

Health Examinations and Job Placement Programs

Objectives of the Health Examination

1. To facilitate placement and advancement of workers in accordance with individual physical and mental fitness.
2. To acquaint the worker with his physical status and to advise him in improving and maintaining personal good health.
3. To safeguard the health and safety of others.
4. To discover and control the effects of unhealthful exposure.
5. To promote cooperative support and understanding of industrial health practices by employer and employee alike.

Quoted from American Medical Association, Council on Industrial Health: "Medical Service in Industry: Industrial Health Examinations." *Journal of the American Medical Association*, 125: 569-570 (June 24) 1944.

Placement Physical Examination Program and Job Placement

The best method of securing accurate placement of an employee within his physical capabilities is the "job analysis—physical capacities appraisal" method that has become so widely used during the past 5 years. This consists of an analysis of each job in the plant to ascertain what demands it makes upon the physique of the worker, such as standing, walking, climbing, lifting, use of one or both hands, and other factors, and an evaluation of the environmental hazards, such as damp, dusty, cold, etc., and specific hazards such as silica dust, mercury vapor, etc. A parallel form listing the same items is completed by the physician after his examination of the applicant and on it he indicates those factors which he feels the applicant is totally or partially unable to meet. By dovetailing the physician's physical capacities appraisal of the applicant with the physical demands and environmental hazards analysis of available jobs, the employment interviewer can place the individual in a job that will not affect his general health unfavorably.

The preplacement examination must obviously be thorough if accurate placement is to be accomplished since all of the applicant's defects must be known if all of his limitations are to be considered.

The effort directed at proper placement of the applicant is vitiated if no system of control and follow-up is maintained. The supervisor must be advised that the individual is specially assigned to the work and no transfer to other work may be effected without prior clearance through the medical department. There should be no discussion with

the supervisor of the pathology present in the employee since this destroys the confidential nature of the examination, but discussion of the work limitations is permissible so that the supervisor may know wherein his assignment of the employee is limited.

A vitally important part of the replacement examination is the discussion with the employee of remediable defects where treatment will cure or alleviate conditions found by the examining physician. This element of the examination is often overlooked by the busy physician; yet it can often produce marked improvement in the employee's general health. Where advice as to needed remedial measures has been given, there should be instituted a careful system of follow-up to determine whether such measures have been taken and, if so, to exhort to action, since human nature is often loath to take active steps to improve general health. Follow-up should also be directed at determining the continued use of protective appliances such as a truss for the employee with a hernia, or safety goggles for the employee who is blind in one eye. A check-up on continuing treatment for hypertension or noncontagious lues and kindred disorders should be made. Failure to advise the employment applicant of remediable defects is a cardinal sin, but failure to follow-up medical recommendations may nullify all the good intentions of such advice.

The employment applicant being examined should be given every consideration normally accorded a private patient. He should first be fully advised as to the purpose of the examination, and often the responsibility for thus orienting the applicant falls to the nurse. At the beginning of the examination or before the physician arrives the nurse takes the opportunity to explain the purpose and value of the examination. . . .

Medical rejections are more and more being narrowed to communicable disease, insanity, marked debility and extensive physical incapacities. We have heard much in the past 7 years regarding the employment of the physically handicapped. Actually almost all of us are physically substandard in some detail. The term handicapped is really one of degree. It should be sharply divided into static and dynamic defects when discussing employability. Static defects are those physical impairments which have reached an end point and are not progressive and will not of themselves grow worse. An amputated hand, or a leg withered by poliomyelitis are examples of this type. These are employable. Dynamic defects are those which are progressive and changing; active tuberculosis or myocardial damage with cardiac decompensation are dynamic conditions and are not employable.

Extensive employment of those with static defects has proven that their productive output, their absence record, their injury frequency, and severity rates and their labor turnover are as good or better than

unimpaired workers, provided they are assigned to work that fits their limitations.

It has been thought by many that companies issuing workmen's compensation insurance coverage increase the premium where the physically handicapped are employed. This is not true. Rates are based on experiences of the class of industry and modified in most cases by the individual plant experience. There is no indication that losses are increased when the physically handicapped are properly placed. We do not believe that the rejection of the physically handicapped from employment for that reason is either necessary or sound procedure.

To demand that every applicant for employment have the physical qualifications of an athlete is to overlook a valuable portion of the employable population whose worth is increased in the present manpower shortage faced by some industries. Fundamentally only a few physical abilities are needed to do a given job. It is not necessary to have a man who has the all-around appearance and physical qualifications of a football player to perform a job which basically requires only good eyesight plus the use of one good hand. . . .

All of the logic behind the adoption of preplacement examinations applies as well to periodic examinations. Only through continuing health check-ups can continuing assurance of good health, safe placement, and optimum production be obtained. There is no reason to suppose that the worker's physical status during years of employment will remain the same as it was at the time of preplacement examinations. . . . Because the purpose of periodic health examinations in industry is to uncover early physical changes affecting the worker's health, the most intelligent approach is to examine first and most frequently those employees in whom we would most expect to find such changes. In order of importance these are employees exposed to toxic hazards, those with conditions that suggest progressive changes at time of hire, those at middle age, or beyond, and finally the remainder of the plant population, including the executive group and those whose work seriously influences the safety of others.

Quoted from O'Connor, Robert B.: "The Preplacement Physical Examination Program" and "Periodic Examinations in Industry." Health At Work. Boston, Liberty Mutual Insurance Co. (Undated.)

Successful, correct placement involves an understanding of several fundamental principles, most important of which are the following:

1. Nearly all disabled persons have more ability than disability.
2. Very few jobs require all of a man's ability.
3. Proper placement involves matching a worker to a job on the basis of his ability to meet the demands of the job. When this is done, the disability disappears as a job factor.
4. It is important to understand the nature of a disability and what it means in terms of work limitations and health and safety

considerations. In other words, each disability may impose upon the individual certain limitations as to the activities in which he may engage and the work conditions and accident and health hazards to which he may be exposed.

5. It is possible to employ suitably the great majority of workers classifiable as handicapped, but there is a small percentage who are employable only under sheltered conditions or in special workshops. There are also some who are homebound and are not classifiable as employable except under special arrangements.

Whatever a person's disability may be, to match him successfully with a job in which his health and safety will be maintained and in which his efficiency will equal or excel that of an able-bodied person, these four requirements must be met:

1. **Physical ability:** The worker should have the ability to accomplish the task efficiently, i. e., be able to meet the physical demands of the job. For example, a man on crutches could not be placed in a job requiring heavy lifting, carrying heavy weights, or extensive walking, especially on slippery surfaces.

2. **Personal safety:** The worker should not be a hazard to himself. For instance, a person subject to dizzy spells should not work on a ladder or scaffold or around moving machinery, where he may be seriously injured or killed if he becomes dizzy on the job.

3. **Safety of others:** A person shall not work at a job where his disability is likely to cause an accident that might injure others. An epileptic person, for example, should not drive a bus or operate an overhead crane, because he may have an attack while working, lose control, and cause injury to others.

4. **Personal health:** The job should not aggravate the disability of the worker. For instance, a person with heart trouble should not be placed in a job that requires considerable stair climbing, running, heavy lifting, or other strenuous tasks. A person with a skin disease should not be exposed to skin irritants.

Quoted from Johnstone, Rutherford T.: *Occupational Medicine and Industrial Hygiene*. St. Louis, The C. V. Mosby Co., 1948, pages 546-547.

In August of 1943 the West Coast Office of the War Manpower Commission sponsored a new technic for the selective placement of workers in accordance with their physical capacities. . . .

The technic is named Physical Demands and Capacities Analysis. Its essential feature is the analysis of both the physical demands of jobs and the physical capacities of workers along the same basic pattern. . . . It was found that both the physical demands of the job and the physical capacities of the worker can be analyzed under twenty-five major headings, such as lifting, carrying or handling. It was also found that both the environmental demands of the job and the environmental capacities of the worker can be analyzed under

twenty-five major headings, such as inside, outside, high temperature or low temperature. . . .

Let us consider, for example, the physical factor of lifting. The analyst determines how much lifting, if any, a specific job requires. The physician estimates whether or not the worker shall be restricted in respect to lifting and, if so, the maximum weight he can safely lift. Therefore, in respect to the physical factor of lifting, it can be said whether or not the worker is suited to the specific job. The other physical factors are similarly treated.

Likewise, in respect to the environmental factor of working outside, the analyst determines whether or not the specific job requires working outside. The physician rules whether or not the worker can work outside. Therefore, in respect to the environmental factor of working outside it can be stated whether or not the worker is suited to the specific job. The other environmental factors are similarly treated. . . .

The physical capacities analysis is prepared by the physician in triplicate with the use of carbon paper. The original form is sent to the placement officer. It is to be noted that the clinical diagnosis, which is not needed for placement, does not appear on the original form. The duplicate form is attached to the worker's clinic record, and the triplicate is kept for reference in a central file in the medical department. The diagnosis appears on the latter two records in the space provided and thus preserves the confidential nature of the diagnosis. After the worker has been placed, the placement officer completes the lower section of the original record. He indicates the new job assigned on a detachable part of the form and sends it to the medical department for attachment to the patient's clinical record. Record of the placement is also noted on the triplicate form in the central medical reference file. . . .

It must be clear that the translation of clinical data into physical capacities presents many problems. No claim is advanced beyond the fact that a start has been made. For example, there may never be a categorical answer to the question of how much lifting should be allowed a specific individual with rheumatic heart disease, grade II. It has been said that the physician's judgment in each individual case may be the only criterion. . . .

With the foregoing information available concerning the worker and job, there still remains the task of matching the worker and the job. Essentially this task is the responsibility of the placement officer who uses the information supplied by the physician and the analyst. . . .

There is nothing in physical demands and capacities analysis which singles out the handicapped. The technic applies equally to all persons—male or female, young or old, able bodied or physically limited. All workers are analyzed in respect to physical capacities as objectively as all jobs are analyzed in respect to physical demands.

This is as it should be, for the difference between the able bodied and the handicapped is after all but one of degree.

Quoted from Kuh, Clifford and Hanman, Bert. "Current Developments Affecting the Physician's Role in Manpower Utilization." *Proceedings of the Sixth Annual Congress on Industrial Health* Chicago, Council on Industrial Health, American Medical Association, 1944, pp. 52-56.

In a critical inventory of our present situation, one important problem . . . is the health of our leaders, specifically of our industrial executives.

Although there is no direct evidence that mortality rates from heart disease are higher among businessmen than others, one can hardly read the daily obituary notices without seeing a note of one or more young executives, who have died "in harness." Last year General Motors lost 29 men of executive rank, 16 of whom died of cardiovascular disorders. This is the group that is most expensive to train for the wisdom of judgment that comes with experience is their most valuable asset. . . .

More than 300 corporations now offer their executives periodic health examinations. One of the first to do so was General Motors. In analyzing their 1946 experience, General Motors found that of 718 executives examined, 590 showed some pathology, of which 24 percent was related to diseases of the heart and circulation.

The Consolidated Edison Co. of New York recently reported its experience with 307 executives in "Industrial Medicine and Surgery" (May 1950) in which Dr. S. Charles Franco says: "The periodic health examination uncovered major medical conditions in 25 percent of the executives examined. These mainly involved the cardiovascular system. Obesity was another major finding, and 50 percent of these had associated cardiovascular involvement. Experience with health counseling shows that these conditions can be prevented in many cases, and greatly improved in others."

This is the same experience as that of the Standard Oil Co., whose medical director, Dr. Robert Page, has reported that out of 290 executives examined, 200 had medical problems, many of which were important, and materially affected working ability. Stressing the importance of frequent examinations, Dr. Page said, "It is only when disorders are found in very early stages that proper corrective procedures will give favorable results and the true principles of constructive medicine can be applied."

A unique program of health examinations has been operating at the Greenbrier Clinic in White Sulphur Springs, W. Va., for 2 years. . . . The first 2 years' experience has been most informative. One company has sent 89 executives for examination. In only 11 of these no disease was found; 24 were overweight, and 29 had some disease of the cardiovascular system.

It was interesting that in this group, 17 showed evidence of secondary anemia. . . . Evidently, some successful executives today do

not select their diet on the basis of modern nutritional knowledge, but rather on personal likes and dislikes.

Dr. Baker and his associates (of the Greenbrier Clinic) note that an occasional physical examination is not enough, but, just like that for the pilots, the real value of such a program comes from it being a regular procedure with a continuous health record, by which problems can be evaluated properly while they are still in the preventable stage.

Quoted from Rusk, Howard A.: "Industries Act to Keep Check on Health of Their Leaders." The New York Times (July 30) 1950.

Table 73.—Percent of surveyed establishments with physicians participating in specified job placement activities, by size of establishment ¹

Size class (number of employees)	Number of establishments surveyed	Percent of establishments with physicians participating in activities relative to—		
		Physical requirements	Placement transfer	Job analyses
All establishments.....	278	53.3	50.1	16.9
Under 500.....	43	65.2	44.3	9.3
500 to 999.....	49	34.5	34.5	6.3
1,000 to 1,499.....	50	60.0	58.0	22.0
1,500 to 1,999.....	17	71.6	64.8	17.6
2,000 to 3,999.....	42	52.4	52.4	19.1
4,000 to 9,999.....	43	53.5	53.5	18.6
10,000 and over.....	34	41.2	50.0	29.4

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about ¼ of whom were women. About 6 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 36.

Extent and Types of Health Examinations

Table 74.—Distribution of surveyed establishments reporting time allowance for preplacement physical examinations, by average time allowed ¹

Average time allowed	Establishments	
	Number	Percent
Total.....	248	100.0
1 hour or more.....	21	8.5
30 to 60 minutes.....	84	33.9
10 to 20 minutes.....	143	57.7

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, p. 28.

Table 75.—Number and percent of surveyed establishments providing preplacement and periodic physical examinations (required and voluntary) to specified type of personnel, by size of establishment ¹

Size class (number of employees)	Type of personnel eligible for examinations	Establishments providing—							
		Preplacement examinations				Periodic examinations			
		Required		Voluntary		Required		Voluntary	
		Number	Percent of total in size class	Number	Percent of total in size class	Number	Percent of total in size class	Number	Percent of total in size class
1 to 249 (23 establishments surveyed).....	Hourly workers.....	20	87.0	6	26.1	3	13.0	4	17.4
	Office personnel.....	9	39.1	4	17.4	1	4.3	3	13.0
	Supervisory staff.....	9	39.1	4	17.4	2	8.7	3	13.0
	Executives.....	4	17.4	7	30.4	2	8.7	3	13.0
250 to 499 (38 establishments surveyed).....	Hourly workers.....	31	81.6	1	2.6	9	23.7	7	18.4
	Office personnel.....	25	65.8	3	7.9	7	18.4	6	15.8
	Supervisory staff.....	25	65.8	3	7.9	9	23.7	7	18.4
	Executives.....	16	42.1	7	18.4	7	18.4	8	21.1
500 to 999 (57 establishments surveyed).....	Hourly workers.....	53	93.0	1	1.8	15	26.3	7	12.3
	Office personnel.....	39	68.4	7	12.3	10	17.5	10	17.5
	Supervisory staff.....	39	68.4	5	8.8	10	17.5	8	14.0
	Executives.....	32	56.1	8	14.0	8	14.0	12	21.1
1,000 to 1,999 (75 establishments surveyed).....	Hourly workers.....	71	94.7	1	1.3	16	21.3	19	25.3
	Office personnel.....	59	78.7	6	8.0	10	13.3	20	26.7
	Supervisory staff.....	55	73.3	9	12.0	10	13.3	19	25.3
	Executives.....	46	61.3	13	17.3	10	13.3	20	26.7
2,000 to 4,999 (73 establishments surveyed).....	Hourly workers.....	71	97.3	---	---	34	46.6	16	21.9
	Office personnel.....	64	87.7	4	5.5	17	23.3	21	28.8
	Supervisory staff.....	62	84.9	3	4.1	20	27.4	19	26.0
	Executives.....	50	68.5	8	11.0	19	26.0	21	28.8
5,000 and over (67 establishments surveyed).....	Hourly workers.....	63	94.0	2	3.0	24	35.8	20	29.9
	Office personnel.....	60	89.6	3	4.5	7	10.4	28	41.8
	Supervisory staff.....	59	88.1	4	6.0	10	14.9	33	49.3
	Executives.....	48	71.6	8	11.9	9	13.4	39	58.2

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, pp. 27, 30.

Table 76.—Percentage distribution of surveyed establishments, by preplacement and periodic health examination practices, for each specified size class and survey period ¹

Size class (number of employees)	Number of establishments surveyed	Percentage distribution of establishments by examination practice							
		Preplacement				Periodic			
		Total	Routine	Special groups	None	Total	Routine	Special groups	None
Period of survey, 1929-40									
Total.....	1,596	100	64.2	8.1	27.7	100	17.3	24.2	58.5
1 to 249.....	98	100	39.8	4.1	56.1	100	21.4	0	78.6
250 to 499.....	224	100	58.0	4.9	37.1	100	16.1	12.9	71.0
500 to 999.....	396	100	55.3	8.8	35.9	100	14.7	16.9	68.4
1,000 and over.....	878	100	72.4	9.0	18.6	100	18.4	33.0	48.6
Period of survey, 1941-45									
Total.....	345	100	79.0	17.0	4.0	100	17.0	54.0	29.0
1 to 249.....	4	100	100.0	0	0	100	25.0	25.0	50.0
250 to 499.....	25	100	88.0	12.0	0	100	20.0	44.0	36.0
500 to 999.....	75	100	69.0	24.0	7.0	100	23.0	41.0	36.0
1,000 and over.....	241	100	81.0	15.0	4.0	100	16.0	59.0	25.0

¹ Based on a personal survey of medical services in 1,941 industrial establishments. A certificate of approval was given to each establishment in which the medical organization and service were fully approved and were of such a nature as to give reasonable assurance of continued compliance with the Minimum Standards for Medical Service in Industry formulated by the College's Committee on Industrial Medicine and Traumatic Surgery. The surveyed industries employed more than 5.5 million workers, about 20 percent of whom were women. Less than 10 percent of the workers were in establishments employing 1,000 workers or less.

Source: Hess, Gaylord R.: Medical Services in Industry and Workmen's Compensation Laws. Chicago, American College of Surgeons, 1946, p. 42.

Table 77.—Distribution of replies from surveyed establishments indicating the percent of examinees rejected as a result of preemployment physical examinations, by size of establishment and percent rejected ¹

Size class (number of employees)	Number of establishments surveyed	Replies received				
		Total number	Number indicating specified percent of examinees rejected			
			Under 1 percent	1-5 percent	6-10 percent	11-50 percent
All establishments.....	2,064	1,154	323	578	169	84
1 to 249.....	821	373	110	187	48	28
250 to 499.....	467	258	71	124	41	22
500 to 749.....	210	131	32	69	23	7
750 to 999.....	148	95	31	38	18	8
1,000 to 1,999.....	236	146	39	74	23	10
2,000 to 4,999.....	118	100	27	60	8	5
5,000 to 9,999.....	28	21	5	11	4	1
10,000 to 19,999.....	26	24	7	12	4	1
20,000 and over.....	10	6	1	3	0	2

¹ Based on a 1940 survey of 1,500 companies (2,064 plants) in 47 States. With 2 exceptions, not more than 10 percent of the plants were located in any 1 State (New York, 11.3; Pennsylvania, 10.6). About 2 million workers were covered, 5 percent were employed by plants with less than 250 employees and 40 percent by plants with 5,000 or more. More than 17 major industrial groups were represented by the surveyed industries. Less than 10 percent of the plants were in any 1 group except the following: Food and miscellaneous products, 12 percent; machinery and machine tools, 14 percent; metal products, miscellaneous, 16 percent.

Source: National Association of Manufacturers: Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, p. 61.

Table 78.—Percent of surveyed establishments including specified items in replacement physical examinations, by type of personnel examined ¹

Examination items	Percent of 333 establishments including item in examinations for—			
	Hourly workers	Office personnel	Super- visory staff	Executive candidates
Complete history, including:				
Voluntary complaints.....	56.8	47.1	45.9	37.5
Complaints on inquiry.....	56.5	51.4	48.6	40.5
Systematic review.....	46.2	39.0	38.4	31.8
Employee's past illnesses.....	78.1	61.0	55.3	48.0
Family.....	43.5	47.4	34.5	29.4
Social history (smoking, drinking, exercise, etc.).....	35.4	27.9	26.4	22.2
Temperature, pulse, respiration.....	76.0	60.7	27.9	48.3
Height, weight, posture.....	84.1	65.2	62.8	51.7
Eyes.....	65.5	48.6	44.4	36.6
Far vision.....	77.8	60.4	58.0	46.2
Near vision.....	71.2	55.3	53.2	41.4
Color vision.....	3.3	5.7	.9	2.4
Ophthalmoscopic.....	18.3	20.4	18.0	15.9
Ears.....	46.5	33.9	33.6	28.5
Gross hearing tests.....	67.3	53.2	51.4	39.6
Audiometer test.....	9.0	9.6	8.4	7.2
Otoscope.....	30.6	27.6	26.7	21.6
Nose.....	72.1	56.2	55.3	45.9
Mouth.....	78.4	61.0	59.5	49.8
Throat.....	80.8	62.8	61.0	50.2
Teeth—gums.....	80.8	62.8	60.1	48.6
Neck.....	64.3	53.8	51.7	42.9
Glands.....	68.8	52.6	49.5	41.4
Heart.....	86.8	67.0	63.7	52.3
Lungs.....	82.0	65.2	62.8	51.1
Breasts.....	47.4	38.7	36.0	30.3
Blood pressure.....	84.6	64.6	62.8	51.1
Abdomen.....	3.3	2.7	1.5	1.8
Hernia.....	6.0	6.0	2.4	3.9
Spine.....	55.0	49.5	48.3	39.6
Rectum.....	47.4	37.2	36.6	28.5
Genitals.....	65.8	53.2	51.4	41.4
Extremities.....	73.0	58.9	57.7	46.8
Varicose veins.....	3.6	3.6	2.7	1.8
Reflexes.....	66.1	51.7	49.8	39.6
Romberg.....	37.5	32.4	29.7	25.2
Skin condition.....	77.2	60.4	58.3	46.5
Musculature.....	54.4	44.7	42.6	35.4
Joints.....	60.7	49.2	47.4	36.3
X-ray of chest.....	32.4	27.9	24.9	21.9
X-ray of teeth.....	2.1	4.2	3.6	3.6
Electrocardiogram.....	4.8	7.8	8.4	7.8
Complete blood count.....	12.9	12.9	13.8	13.8
Urinalysis (including microscopic).....	57.7	48.0	48.0	39.3
Serology test for syphilis.....	45.9	38.1	38.1	31.2

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery 10.8; metals, 13.2).

Source: Spears, Ethel M. Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, p. 23.

Table 79.—Percentage distribution, by preemployment examination practice, of surveyed establishments classified according to size of establishment and status of physician in charge of medical program ¹

Size class (number of employees)	All establishments				With full-time physician			
	Total	Percent providing examinations to—			Total	Percent providing examinations to—		
		All employees	Some employees	None		All employees	Some employees	None
Number of establishments surveyed.....	957	723	62	172	173	159	10	4
Total.....	100	75.5	6.5	18.0	100	91.9	5.8	2.3
Less than 500.....	100	70.0	5.6	24.4	100	100.0	0	0
500 to 999.....	100	72.7	7.1	20.2	100	66.7	33.3	0
1,000 to 1,999.....	100	73.1	5.1	21.8	100	95.0	0	5.0
2,000 to 2,999.....	100	80.5	5.1	14.4	100	95.8	0	4.2
3,000 to 3,999.....	100	81.1	7.5	11.4	100	95.2	4.8	0
4,000 to 4,999.....	100	85.2	3.7	11.1	100	80.0	10.0	10.0
5,000 and over.....	100	84.0	10.4	5.6	100	92.3	6.6	1.1

Size class (number of employees)	With part-time physician				With physician on-call			
	Total	Percent providing examinations to—			Total	Percent providing examinations to—		
		All employees	Some employees	None		All employees	Some employees	None
Number of establishments surveyed.....	412	351	19	42	372	213	33	126
Total.....	100	85.2	4.6	10.2	100	57.2	8.9	33.9
Less than 500.....	100	87.1	3.2	9.7	100	60.7	6.8	32.5
500 to 999.....	100	88.8	4.1	7.1	100	61.2	8.2	30.6
1,000 to 1,999.....	100	82.6	4.2	13.2	100	52.0	8.0	40.0
2,000 to 2,999.....	100	93.3	3.3	3.4	100	47.0	11.8	41.2
3,000 to 3,999.....	100	84.6	3.9	11.5	100	16.7	33.3	50.0
4,000 to 4,999.....	100	87.5	0	12.5	100	100.0	0	0
5,000 and over.....	100	62.1	17.2	20.7	100	60.0	40.0	0

¹ Based on the results of 2 surveys in which the Division of Industrial Hygiene participated during 1942. The 962 industries studied were located in 36 States, employed approximately 2.5 million workers, and had some form of organized medical service already in existence in 1942. The majority of the establishments had at least one full-time nurse. At the time the studies were made a large portion of the industries were engaged in or were in the process of changing over to essential war activities. Approximately 1/4 of the establishments were located in New England and the Middle Atlantic States, 1/4 were in the Middle West, and the remainder were in the Pacific Coast States and in the South.

Source: Brinton, Hugh P., Dreessen, W. C., Trasko, Victoria M.: "Wartime Industrial Medical Services." *Industrial Medicine*, 12:526 (August) 1943.

Table 80.—Distribution of surveyed establishments according to practice regarding requirement of special physical examinations for specified type of workers ¹

Type of workers examined	Establishments				
	Total surveyed	Practice reported—			Not reporting
		Yes	No	Varies	
	Number				
Physically limited workers.....	333	106	113	76	38
Older workers.....	333	60	142	90	41
Workers in hazardous occupations.....	333	128	90	47	68
Employees promoted to executive positions.....	333	19	263	18	33
Employees promoted to supervisory positions.....	333	16	264	24	29
Employees who are upgraded (below supervisory jobs).....	333	7	263	33	30
Employees who are transferred.....	333	33	200	70	30
Employees who return to work after illness.....	333	179	61	78	15
Employees leaving company.....	333	8	285	24	16
	Percentage distribution				
Physically limited workers.....	100.0	31.8	33.9	22.8	11.4
Older workers.....	100.0	18.0	42.6	27.0	12.3
Workers in hazardous occupations.....	100.0	38.4	27.0	14.1	20.4
Employees promoted to executive positions.....	100.0	5.7	79.0	5.4	9.9
Employees promoted to supervisory positions.....	100.0	4.8	79.3	7.2	8.7
Employees who are upgraded (below supervisory jobs).....	100.0	2.1	79.0	9.9	9.0
Employees who are transferred.....	100.0	9.9	60.1	21.0	9.0
Employees who return to work after illness.....	100.0	53.8	18.3	23.4	4.5
Employees leaving company.....	100.0	2.4	85.6	7.2	4.8

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: *Company Medical and Health Programs (Studies in Personnel Policy, No. 96)*. New York, National Industrial Conference Board, Inc., 1948, p. 31.

Classification of Health Examination Findings

A classification of physical findings in code form should be used to convey information to the employment officer regarding the fitness for work of the applicant or employee. The following classification is similar to that formulated by the Conference Board of Physicians in Industry and the use of this classification is recommended by the American College of Surgeons:

Class A or I. Physically fit for any work.

Class B or II. Physically underdeveloped or has some minor anatomical or other correctable defect; otherwise fit for most jobs.

Class C or III. Employable but, owing to certain impairments or conditions, requires special placement or medical follow-up, or both. Subject to approval by management for jobs compatible with existing conditions.

Class D or IV. Unfit for employment.

In the above classification, it is obvious that the provisions in class B and class C are not adequately defined nor informative. . . . Each physical limitation or defect . . . [and] each job requirement . . . may be designated by some adopted code such as—

<i>Employee physical disabilities</i>	<i>Physical factors of job</i>	<i>Environmental factors of job</i>
A. Blind one eye.	1. Climbing.	50. Cramped quarters.
B. Blind both eyes.	2. Kneeling.	51. High humidity.
C. Cardiovascular condition.	3. Lifting.	52. High places.
D. Hearing defects.	4. Pulling.	53. High temperatures.
E. Hernia.	5. Reaching.	54. Inside work.
F. Joint limitations.	6. Sitting.	55. Low temperatures.
G. Loss of fingers.	7. Standing.	56. Mechanical hazards.
H. Loss of hand.	8. Stooping.	57. Moving objects.
I. Mute.	9.)	58. Noise.
J. Vision defects.	10.) etc.	59. Outside work.
K. Obesity.	11.)	60. Toxic exposure.
L. Arthritis.	12.)	61. Wet quarters.
M. Diabetes.		62. Working alone.
N.)		63. Vibration.
O.) etc.		64.)
P.)		65.) etc.
		66.)

Only the information relative to columns 2 and 3 of the [above table] should be submitted to the placement officer. The information in column 1 is for the doctor's confidential record of the diagnosis and need not be divulged in the doctor's report to the placement officer. However, applicants always should be informed regarding their physical impairments and should be advised accordingly.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, pages 25-26.

Labor-Management Aspects of Industrial Health Examinations

Employee Attitude Toward Examinations

The benefits of preplacement physical examinations and periodic health audits are generally recognized but organized labor units in some sections of the country are still opposed to them. They contend that in many instances the examination record is used as a "black list"; that the records of the examinations are not always kept in a properly confidential manner by the physician in the medical department but are sent to the employment, personnel, or some other department; that office workers and officials should be included in these examinations if they are so beneficial; and that the examinations are only a culling process since male nurses or laymen are employed in a number of establishments to give them.

The medical examiner can reduce the opposition by labor to these examinations if the applicants examined are impressed by an unbiased and professional procedure, by kindly interest and advice when indicated, by the records being kept in the medical department, and by the results of the examinations being reported to the employment officer only in the classification code adopted. . . .

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, page 22.

Problem of Adverse Findings

One of the most controversial points in labor-management relations in the field of industrial hygiene has been the physical examination. Until recently, neither management nor labor has fully understood how to utilize properly the physical examination as a technique for the improvement of health of the industrial worker. In the past, and in some instances even today, routine preplacement and periodic physical examinations have been made a management requirement, in order to protect it in compensation litigation and to reduce the cost of insurance premiums. Labor, on the other hand, has insisted on contract clauses or laws designed only to protect workers against unfair use of the examination rather than making it a health service to the worker. We must recognize first that the physical examination is more than a medical problem. It is also a socioeconomic problem. The man who has spent his working life in one industry, and has acquired seniority and a higher wage scale cannot be expected willingly to accept placement in a less arduous but less remunerative job, even though it may save him from premature death due to a health condition discovered in the examination. Enlightened employers recognize this problem even though they have not yet provided the answer. These problems can be solved if all interested groups get together and put their minds to it. The above rule (see following excerpt) dealing with the review of a periodic physical examination is reasonable and it should serve to protect both the employer and the employee.

Quoted from Bloomfield, J. J.: *Industrial Hygiene Problems in Bolivia, Peru, and Chile* (Public Health Bull. No. 301). Washington, Government Printing Office, 1948, page 136.

Review and Appeal of Health Examination Findings

When a worker has been physically examined, and the doctor making the examination reports that he is physically unfit for any work or for certain classes of work, which report may have an adverse effect on the employment of such worker, the following procedure shall apply: The worker may designate a physician of his choice and request a review of the findings made by the examining doctor. These two physicians may proceed to render a joint report. If they are not in agreement, then a third physician, agreed on by the two

reviewing physicians, shall be selected and his findings shall be final. If the two physicians cannot agree on a third physician, then the chairman of the industrial commission in the State in which the plant is located shall make the selection.

Quoted from American Medical Association, Council on Industrial Health: Medical Service in Industry: Industrial Health Examinations. Journal of the American Medical Association, 125: 569-570 (June 24) 1944.

SECTION V

Professional Personnel in Plant Health and Medical Services

Personnel and Relationships

Professional Personnel Employed

Table 81.—Number and percent of surveyed establishments employing specified type of medical, nursing, and auxiliary personnel¹

Type of personnel employed	Number of establishments employing personnel				Per- cent of 333 estab- lish- ments
	Full time	Part time	On call	Total	
Medical director.....	78	101	14	193	58.0
Assistant medical director.....	22	20	3	45	13.5
Physicians—other than medical director and assistant medi- cal director.....	26	92	56	174	52.3
Consultants—surgeons, dermatologists, etc.....		18	68	86	25.8
Full-time nurses combining in-plant and visiting duties.....	114			114	34.2
Part-time nurses combining in-plant and visiting duties.....		10		10	3.0
Full-time in-plant nurses.....	189			189	56.8
Part-time in-plant nurses.....		27		27	8.1
Full-time company visiting nurses.....	31			31	9.3
Part-time company visiting nurses.....		3		3	.9
Oculists.....	4	27	50	81	24.3
Dentists.....	4	16	21	41	12.3
Psychiatrists.....	4	7	18	29	8.7
Industrial hygienists.....	17	3	4	24	7.2
Psychologists.....	5	1	5	11	3.3
Mental hygienists.....	1			1	.3
Podiatrists.....		4	3	7	2.1
X-ray technicians.....	28	9	13	50	15.0
Medical laboratory technicians.....	30	9	7	46	13.8
Physical therapists.....	10	7	5	22	6.6
Dental hygienists.....	6	1		7	2.1
Nutritionists.....	9		1	10	3.0
Practical nurses.....	14	5	1	20	6.0
First-aid attendants.....	41	34	8	83	24.9
Doctor's assistants (nonprofessional).....	17	3	1	21	6.3

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, pp. 12, 16.

Table 22.—Number and percent of surveyed establishments in each size class employing specified type of medical, nursing, and auxiliary personnel¹

Type of personnel employed	Size class (number of employees)																									
	1-249			250-499			500-999			1,000-1,999			2,000-4,999			5,000 and over										
	Full time	Part time	On call	Full time	Part time	On call	Full time	Part time	On call	Full time	Part time	On call	Full time	Part time	On call	Full time	Part time	On call	Percent of establishments							
Medical director.....	2			3	8	2	18	1	21	36.8	8	28	3	39	52.0	27	27	4	58	79.5	38	18	4	60	89.6	
Assistant medical director.....				1	1	1	1	1	2	3.5	1	7		8	10.7	5	5	1	11	15.1	15	6		21	31.3	
Physicians—other than medical director and assistant medical director.....	4	3	7	5	7	12	12	8	21	36.8	15	12	15	12	27	36.0	5	21	15	41	56.2	20	35	11	66	96.5
Consultants—surgeons, dermatologists, etc.....				2	8	10	4	8	12	21.1		3	11	14	18.7		3	23	26	35.6		6	18	24	35.8	
Full-time nurses combining in-plant and visiting duties.....				14		14			23	40.4				26	34.7				30	41.1				21	31.3	
Part-time nurses combining in-plant and visiting duties.....					1	1	2	2	2	3.5		3	3	3	4.0				2	2.7		2	2		2	3.0
Full-time in-plant nurses.....	2	2	1	13	13	13	34.2	23	23	40.4	47	47	47	62.7	53	53	53	53	53	72.6	51	51	51	51	76.1	
Part-time in-plant nurses.....	1	1	1					3	3	5.3		10	10	13.3	8	8	8	8	8	11.0	5	5	5	5	7.5	
Full-time company visiting nurses.....											5	5	5	6.7	10	10	10	10	10	13.7	16	16	16	16	23.9	
Part-time company visiting nurses.....				1	1	1	1.8	1	1	1.8	1	1	1	1.3	1	1	1	1	1	1.4	1	1	1	1	1.4	
Oculists.....	1	1	1	4	6	10	26.3	4	5	10	17.5	1	3	12	16	21.3	5	17	22	30.1	3	10	9	22	32.8	
Dentists.....					1	1	2.6	1	4	7.0				3	4.0				6	9	15	4	6	8	18	26.9

Table 83.—Percentage distribution of surveyed establishments by type of physician in charge of medical program, and percent of establishments employing nurses full time, for each specified size class and survey period ¹

Size class (number of employees)	Establishment					
	Number surveyed	Percentage distribution by type of physician in charge of medical program				Percent employing nurses full time
		Total	Full-time physician	Part-time physician	Physician on call	
Period of survey, 1929-40						
All establishments.....	1, 596	100	23. 9	42. 9	33. 2	64. 3
1 to 249.....	98	100	5. 1	24. 5	70. 4	10. 2
250 to 499.....	224	100	8. 9	38. 0	53. 1	40. 6
500 to 999.....	396	100	14. 6	42. 7	42. 7	57. 1
1,000 and up.....	878	100	33. 9	46. 4	19. 7	79. 6
Period of survey, 1941-45						
All establishments.....	345	100	29. 0	52. 0	19. 0	96. 0
1 to 249.....	4	100	-----	75. 0	25. 0	25. 0
250 to 499.....	25	100	4. 0	84. 0	12. 0	76. 0
500 to 999.....	75	100	9. 0	47. 0	44. 0	97. 0
1,000 and up.....	241	100	38. 0	51. 0	11. 0	99. 0

¹Based on a personal survey of medical services in 1,941 industrial establishments. A certificate of approval was given to each establishment in which the medical organization and service were fully approved and were of such a nature as to give reasonable assurance of continued compliance with the Minimum Standards for Medical Service in Industry formulated by the College's Committee on Industrial Medicine and Traumatic Surgery. The surveyed industries employed more than 5.5 million workers, about 20 percent of whom were women. Less than 10 percent of the workers were in establishments employing 1,000 workers or less.

Source: Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, p. 42.

Professional Work-time Experience

When the program first started it was decided upon, after studying material from numerous sources, to require 3 hours per week of doctor's in-plant time for every 100 employees and 3 times as much nursing time per week as doctor's time or 9 hours per week per 100 employees. These standards have worked satisfactorily as a beginning until it was demonstrated in the plant that they should be changed because of individual plant problems. At present, the ratio of doctor's to nurse's time is anywhere from 1 doctor hour for every 2½ nursing hours up to 1 doctor hour for every 5 nursing hours. In some plants the doctors have only spent about 2 hours per week per 100 employees instead of 3 as originally suggested, but it has been noticed that 3 hours per week per 100 employees of doctor's time is more satisfactory if a full program is to be carried out. With nursing, about 9 hours per week per 100 employees is a minimum if a good program is to be conducted. If plant problems are numerous this may rise to about 15 hours per week per 100 employees.

Quoted from Millman, Nathan; Calderone, Frank A.; and Greenburg, Leonard: "Cooperative Plan for the Development of Small Plant Health and Industrial Hygiene Program in New York City." *Industrial Medicine*, 15: 373 (June) 1946.

We undertook a painstaking stop-watch study of every phase of medical staff activity involved in attending direct-service cases. . . . This on-the-job analysis covered a period of years, involved more than 100 medical operations, and required over 10,000 stop-watch determinations. The conclusion reached was that **THE AVERAGE MEDICAL STAFF TIME REQUIRED TO COVER A DIRECT-SERVICE CASE IS 11.57 MINUTES.** This 11.57 minutes represents the *unadulterated* time involved, with no allowances for any reason.

	<i>Minutes</i>
Treatment time (professional)-----	7. 20
All phases of clerical time-----	3. 47
Hospital supply, maintenance, sanitation, etc.-----	. 90
Total-----	
	11. 57

This does not include a physician's time. In general, a full-time physician will see about 20 percent of the direct-service visitors. . . . Multiplying the average number of direct-service cases per shift [see p. 39] by our time factor . . . we determine the average medical staff time requirement per shift for each month and for the year. . . . A modest time study of the medical time involved in a minimum preemployment and periodic physical examination without technical help is presented. The totals are 27 and 25 minutes, including 10 and 8 minutes of physician's time respectively. An additional 26 minutes will include several basic technical procedures, including chest X-ray. The over-all totals are 53 and 51 minutes.

Quoted from Fulton, William J.: "Industrial Medical Potentials—A Time and Job Analysis of Medicine in Industry." *Industrial Medicine*, 18: 272-276 (July) 1949.

In November 1946, a questionnaire was sent to 52 companies, of which 45 returned usable replies. The medical departments reported on serve 560,163 employees at 156 locations or establishments. [Thirty-two establishments had less than 500 employees, 28 had 500 to 999 employees, and 96 had 1,000 or more employees.] . . .

The total personnel of medical departments reported by the 45 companies was 1,326, classified as follows: 25 medical directors, 156 full-time physicians, 254 part-time physicians, 8 physicians "on call," 572 full-time nurses, 16 part-time nurses, and 295 other staff. The part-time physicians worked on an average 15 hours a week. If it is assumed that full-time physicians and medical directors are on duty an average of 40 hours per week and if the number of hours worked by part-time physicians is taken into account, it appears that the equivalent of 1 full-time physician was employed for every 2,089 employees. (In calculating this figure the plants for whose part-time physicians the number of hours worked was not reported and two large plants where complete medical service is furnished to the families of employees were excluded.) There was 1 full-time nurse

for every 979 employees and 1 additional clerk or technician for every 1,899 employees.

Quoted from Industrial Relations Counselors, Inc.: "Company Medical Programs." *Occupational Medicine*, 3: 574-575 (June) 1947.

Relation to Top Management

For some time there have been varying differences of opinion as to whether the plant physician or medical director should report directly to top management or indirectly to top management through various departments or divisions. There are those who believe that top management should be primarily concerned about good health for employees and take an active interest in the health program, while others believe that good results may be secured by going through other divisions rather than to top management. It is our belief that much depends upon the type of man to whom the report is made and his active interest and cooperation. Perhaps also a great deal of the success attained depends upon reliance and confidence being placed in medical leadership, with as little management interference as possible. Apparently, from this study, good results have been obtained from both methods, although there are those who feel that from a strong organizational point of view, reporting to top management is to be preferred.

Quoted from Sappington, C. O.: *Industrial Health Department Functions and Relationships* (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, page 43.

Many physicians prefer to report directly to a top company executive primarily because they believe that their programs thereby receive more sympathetic understanding. This arrangement is considered particularly advantageous where personnel departments are limited in scope. On the other hand, many company physicians are convinced that the medical department is an integral part of personnel activities and that administration from the head of that department encourages closer contact and cooperation with all units in the organization. It gives the physician an opportunity to become acquainted with all the members of the personnel department and work closely with the safety and other personnel specialists in studying health problems within the company.

In a few instances, medical officers report to committees. This method of supervision is considered satisfactory in some cases, although it is not generally approved by medical directors. Some of these have experienced difficulties in arranging and maintaining convenient meetings of committee members, with the result that decisions and prompt action on important health problems have been delayed.

Quoted from Spears, Ethel M.: *Company Medical and Health Programs* (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, page 12.

Table 84.—Distribution of surveyed establishments by title of executive to whom the director of the medical department reports and by type of supervision reported for medical departments ¹

Item	Distribution of establishments reporting		Item	Distribution of establishments reporting	
	Number	Percent		Number	Percent
Executive to whom the director of the medical department reports: Total.....	296	100.0	Other.....	29	9.8
President.....	33	11.1	Type of personnel supervising medical department: Total.....	251	100.0
Executive vice president.....	28	9.5	Medical director.....	139	55.4
Vice president for personnel or personnel director.....	129	43.6	Personnel manager.....	77	30.7
Vice president for production, general manager, or superintendent of production.....	77	26.0	Plant nurse.....	13	5.2
			Safety director.....	14	5.6
			Superintendent or top executive.....	8	3.2

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, pp. 11, 12.

Table 85.—Percentage distribution of surveyed establishments in each specified size class, according to administrative responsibility for medical department ¹

Size class (number of employees)	Number of establishments surveyed	Percentage distribution of establishments according to person or department to whom physician in charge is responsible			
		Total	Manager or superior	Department of industrial relations	Insurance carrier
All establishments.....	1,941	109	49	43	8
1 to 249.....	102	100	48	21	31
250 to 499.....	249	100	54	35	11
500 to 999.....	471	100	47	41	12
1,000 and over.....	1,119	100	49	47	4

¹ Based on a personal survey of medical services in 1,941 industrial establishments during survey period 1929-45. A certificate of approval was given to each establishment in which the medical organization and service were fully approved and were of such a nature as to give reasonable assurance of continued compliance with the Minimum Standards for Medical Service in Industry formulated by the College's Committee on Industrial Medicine and Traumatic Surgery. The surveyed industries employed more than 5.5 million workers, about 20 percent of whom were women. Less than 10 percent of the workers were in establishments employing 1,000 workers or less.

Source: Hess, Gaylord R.: Medical Service in Industry and Workmen's Compensation Laws. Chicago, American College of Surgeons, 1946, p. 21.

Person in Direct Charge of Health Services

Table 86.—Percentage distribution of surveyed establishments in each specified size class, by person in charge of health services ¹

Size class (number of employees)	Number of establishments	Percentage distribution by persons in charge of services			
		Total	Physicians	Nurses	Others ²
All establishments.....	278	100	50.0	6.5	43.5
Under 500.....	43	100	15.8	21.1	63.1
500 to 999.....	49	100	33.3	10.0	56.7
1,000 to 1,499.....	50	100	25.6	5.2	69.2
1,500 to 1,999.....	17	100	75.0	0	25.0
2,000 to 3,999.....	42	100	62.3	5.2	32.5
4,000 to 9,999.....	43	100	67.6	0	32.4
10,000 and over.....	34	100	89.3	0	10.7

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about $\frac{1}{4}$ of whom were women. About 5 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

² In the majority of instances, the term "other" referred to the personnel director, the director of industrial relations, or the plant manager, named in order of frequency.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 4.

Table 87.—Percentage distribution of surveyed establishments in each specified size class, by status of physician in charge of medical service program ¹

Size class (number of employees)	Number of establishments surveyed	Percentage distribution of establishments by status of physician in charge			
		Total	Full time	Part time	On call
All establishments.....	962	100	18.0	43.0	39.0
Less than 250.....	40	100	0	25.0	75.0
250 to 499.....	141	100	.7	36.9	62.4
500 to 999.....	240	100	2.5	41.3	56.2
1,000 to 1,499.....	130	100	8.5	52.3	39.2
1,500 to 1,999.....	88	100	10.2	61.4	28.4
2,000 to 2,999.....	118	100	20.3	50.9	28.8
3,000 to 3,999.....	53	100	39.6	49.1	11.3
4,000 to 4,999.....	27	100	37.0	59.3	3.7
5,000 to 9,999.....	71	100	59.1	33.8	7.1
10,000 and over.....	54	100	90.7	9.3	0

¹ Based on the results of two surveys in which the Division of Industrial Hygiene, U. S. Public Health Service, participated during 1942. The 962 industries studied were located in 35 States, employed approximately 2.5 million workers and had some form of organized medical service already in existence in 1942. The majority of the establishments had at least 1 full-time nurse. At the time the studies were made, a large portion of the industries were engaged in or were in the process of changing over to essential war activities. Approximately $\frac{1}{4}$ of the establishments were located in New England and the Middle Atlantic States, $\frac{1}{2}$ were in the Middle West, and the remainder were in the Pacific Coast States and in the South.

Source: Brinton, Hugh P., Dreesen, W. C., Trasko, Victoria M.: "Wartime Industrial Medical Services." *Industrial Medicine*, 12:523 (August) 1943.

Table 88.—Percentage distribution of surveyed establishments with specified type of medical service and personnel, according to status of physician in charge of the medical service program and size of establishment.¹

Size class (number of employees)	Full-time physician in charge			Part-time physician in charge			On-call physician in charge					
	All establishments	With registered nurse only	With registered nurse and others ²	With others ³	All establishments	With registered nurse only	With registered nurse and others ²	With others ³	All establishments	With registered nurse only	With registered nurse and others ²	With others ³
Number of establishments.....	173	67	105	1	414	286	122	26	375	263	69	43
Percent.....	100	38.7	60.7	0.6	100	64.3	29.6	6.1	100	70.1	18.4	11.5
Less than 250.....	0	0	0	0	100	70.0	0	30.0	100	63.3	3.4	33.3
250 to 499.....	100	0	100.0	0	100	65.4	11.5	23.0	100	77.3	10.2	12.5
500 to 999.....	100	33.3	66.7	0	100	76.8	18.2	4.0	100	64.7	17.1	9.6
1,000 to 1,499.....	100	63.6	27.3	9.1	100	67.7	27.9	4.4	100	66.0	27.4	6.9
1,500 to 1,999.....	100	55.6	44.4	0	100	66.7	27.8	5.5	100	65.0	24.0	8.0
2,000 to 2,999.....	100	50.0	50.0	0	100	63.3	26.7	0	100	58.9	32.3	11.8
3,000 to 3,999.....	100	42.9	57.1	0	100	42.3	57.7	0	100	58.3	16.7	0
4,000 to 4,999.....	100	70.0	30.0	0	100	31.3	68.7	0	100	100.0	0	0
5,000 to 9,999.....	100	38.1	61.9	0	100	41.7	58.3	0	100	20.0	80.0	0
10,000 or over.....	100	18.4	81.6	0	100	60.0	40.0	0	0	0	0	0

¹ Based on the results of 3 surveys in which the Division of Industrial Hygiene, U. S. Public Health Service participated during 1942. The 963 industries studied were located in 36 States, employed approximately 2.5 million workers and had some form of organized medical service already in existence in 1942. The majority of the establishments had at least 1 full-time nurse. At the time the studies were made a large portion of the industries were engaged in or were in the process of changing over to essential war activities. Approximately 14 of the establishments were located in New England and the Middle Atlantic States, 5/8 were in the Middle West, and the remainder were in the Pacific Coast States and in the South.

² Includes practical nurses, full-time first-aid workers, part-time registered nurses, full-time technical and professional workers.

Source: Brinton, Hugh P., Dreesen, W. C., Trasko, Victoria M.: "Wartime Industrial Medical Services." Industrial Medicine, 12:523 (August) 1943.

Table 89.—Percentage distribution of surveyed establishments with specified amount of medical direction, according to person to whom nursing personnel is responsible: based on statements of nurses ¹

Person to whom nursing personnel is responsible	All establishments	With physician serving—		
		Full time	Part time	On call
Number of establishments surveyed.....	868	198	324	346
	Percentage distribution according to person responsible			
Total.....	100	100	100	100
Physician.....	31	91	24	3
Physician and personnel or other executive.....	4	1	10	1
Personnel manager.....	30	5	36	39
Superintendent or manager.....	22	1	22	34
Other executive.....	8	1	4	15
Safety director.....	3	0	3	4
All other.....	2	1	1	4

¹ Based on a Nation-wide survey in 1942, of 924 establishments employing approximately 2.5 million workers, conducted by the Committee to Study the Duties of Nurses in Industry, American Public Health Association, with the assistance of the Division of Industrial Hygiene, National Institute of Health. The above information was received from the 868 establishments reporting the employment of at least 1 full-time registered professional nurse. About 5 percent of the 3,000 nurses were in establishments employing less than 500 workers, the balance were about evenly distributed among establishments with 500 to 2,499 workers, with 5,000 to 10,000 workers, and with 10,000 and over.

Source: Whitlock, Olive M., Trasko, Victoria M., Kahl, F. Ruth: *Nursing Practices in Industry* Public Health Bull. No. 283). Washington, Government Printing Office, 1944, p. 35.

Interdepartmental Relationships

If the employer and the employees are to obtain the maximum benefits from the medical service, it is necessary that amicable and cooperative interdepartmental relationships be established. Close cooperation must exist between the physician and the employment officer if the preplacement and periodic physical examinations are to be of any benefit in placing the worker in a position for which he is best fitted. A similar relationship must be maintained with the safety engineer in order to eliminate or control accident and health hazards. Department heads should be apprised of the ingredients in the materials used in order to safeguard against industrial poisoning. The full support of the foremen must be secured in order to obtain continuous observance of all preventive measures and to insure prompt reference to the medical department of all ill or injured employees. . . . The physician and the casualty or employment manager are both concerned with the early return to work of the ill or injured employee although the physician must be the one who is to determine when an employee is able to resume work. Above all the medical department must have the wholehearted support of the official management. Without it, no industrial medical service can attain its maximum efficiency.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, page 21.

It may be that cooperation is desired but, when attempted, cooperation just doesn't seem to "click." Let us do some mental "trouble shooting" to see what may be caught in the gears.

The first matter to check is the one which has been stressed: Are functional prerogatives being respected—or is someone trying to “run” someone else’s program instead of cooperating with it?

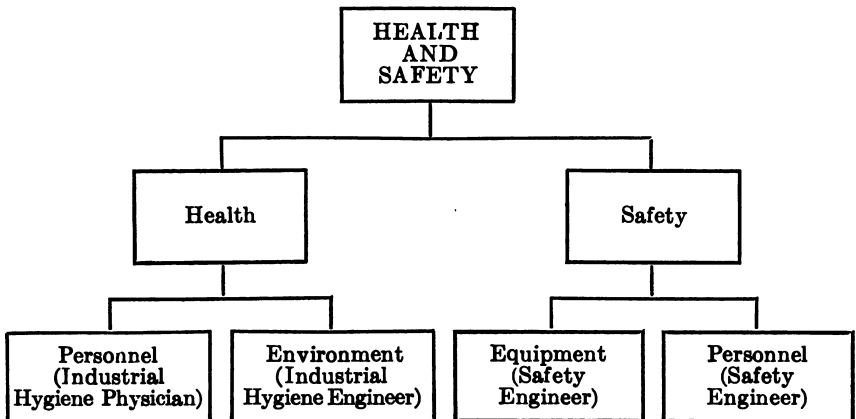
The second question is: Are the lines of responsibility properly defined? Is proper differentiation made between the accidental injuries or occupational diseases of employees and those illnesses which may be classified as “personal?”

The doctor is in a strategic situation to obtain the information necessary for the safety engineer after an injury. He takes the first history, and it is the first story which is important. I know of no doctor who will deliberately set out to deny the safety engineer the history of an accident or necessary details of the injury received. It is when a doctor is approached for information concerning medical conditions other than those for which industry is responsible that he may show his teeth and growl, and, in his resentment, overcompensate by denying that which he should be willing to give.

This situation is also created when the safety engineer, directly or through another lay administrator, asks for the details on all medical cases and wishes to extract the accidental injuries from them.

Statistical information and compilations should be available on a monthly or quarterly basis which presents the picture of health conditions without revealing personal identification. As a matter of fact, where this information is complete, accurate, and well broken down, the finger will be pointed at many conditions which are subject to prevention or control.

References were made above to “health and safety.” After all, these are the representative fields of the two groups of people whom we are discussing. I think we can diagram a home-made scheme which properly interprets the field of the plant physician, the safety engineer, and also that of the industrial hygiene physician and industrial hygiene engineer.



The third question is: Is mutual interest in both programs cultivated? This implies an establishment of good personal relationships to begin with, and the maintenance of these relationships by at least occasional conversations at a time when there is no acute trouble. If both the doctor and the safety engineer understand each other's program and the methods used by each they can be of inestimable help to each other. The safety engineer is constantly in contact with employees who are, or have been, or should be, under the care of the plant physician. He can frequently drop a word of suggestion or add a word of explanation which will improve the relationship and so aid the cure. Similarly the first aid is the natural place for many complaints about safety conditions or practices to be made. Its proper use as a clearing house for these remarks will lead to many a correction of safety conditions. The safety engineer will find the medical department a useful ally. Where there is a part-time or call doctor it is more important than ever. The safety engineer can do much to bring this doctor, too often a stranger, closer to the plant by his contacts with him and in arousing his interest in the plant and its condition.

The fourth question: Is there a recognition of those conditions which must be recognized as joint responsibilities which must be attacked by a team, and which neither the plant physicians or the safety engineer can solve singly? Cutting oil dermatitis is a classic example.

Fifth, and finally: Is there a recognition of those conditions which jointly may not be solved without assistance from other departments within the plant or from other agencies without the plant?

Quoted from Leggo, Christopher: "Plant Physician and Safety Engineer—And the Cooperation Between Them." *Industrial Medicine*, 12: 646-647 (October) 1943.

Industrial nursing has accompanied industrial medicine in evolving from the first-aid station to a service that includes illness and accident prevention, health and safety promotion and care for the sick and injured. They have both become distinct branches of their respective professions and they stand at the threshold of a broad development in their services to industrial workers. *They have both become integral phases of industrial management. . . .*

This development of industrial hygiene reflects the growth of American industry. The war gave impetus to an appreciation of the value of health protection for industrial workers—a movement that had gathered much momentum prewar. Today management, labor, and health authorities are more and more joining forces in promoting industrial hygiene.

From all of this the industrial nurse has emerged from her rather obscure and uncertain status as a first-aid agent to a position of recognized essentiality. The productive value of her work was indicated in the War Manpower Commission's recommendation, made

at the peak of the war nursing shortage, that industrial nursing be classified as essential.

The industrial nurse's relationship to all personnel gives her a strategic value as interpreter of health practices and promoter of good will. Her technical skill makes her the indispensable ally of the physician in the first aid, diagnostic and treatment aspects of industrial medicine. Her close contact with workers and her knowledge of community resources aid the doctor in rounding out his health examinations and in achieving corrective measures. Her ability to evaluate the character and importance of symptoms and to record them properly, make her a valuable adjunct in the compensatory and legal aspects of industrial illness and injury. . . .

Quoted from *The American Association of Industrial Nurses, Inc.: Qualifications of an Industrial Nurse.* New York, The Association, 1945.

Relation to Workers

The Worker's Health Committee

One of the most effective measures that may be utilized for the promotion of health education among industrial employees and their families is the organization of an active health committee, the objectives of which are tailored to the needs of the health problems evidenced by the type and extent of the industry. In the large industrial establishment medical and nursing personnel may encourage the cooperative support of the employees through this medium and thus be enabled to put across the need for ways of living that will help to keep the industrial worker and his family in a sound state of body and mind. In the plant of smaller size, where there is part-time medical and nursing service or only a first-aid attendant, the value of good industrial sanitation may be taught by allocating responsibilities, such as plant inspections pertaining to hygiene and sanitation and health promotional campaign duties, to members of the committee. . . .

The following advantages may be anticipated as a result of the health committee's activities:

1. Opportunities for discussions on the relation of health to safety, production, and morale.
2. Development of an awareness in the employees of the interest that management feels toward their health and welfare. This should reflect in improved labor relations and increased efficiency.
3. Opportunity for the study and correction of real health problems, and a chance for the presentation of new ideas by the management, the medical department, and the representatives of the employees.
4. Establishment of regular, progressive effort in health promotion.
5. Maintenance and analysis of records which will show achievements and "blocks" which may require attention.

6. Presentation of planned, tailored programs and follow-through accomplishments.

7. Assimilation and acceptance of the fundamental principles of good health and the needs of specific health conditions.

8. Revealing of contributory, causative factors and data on accidents and illnesses by the safety committee and health committee, working in conjunction. These, when broken down and efforts coordinated, allow for more specific information for which corrective steps may be introduced.

9. Cooperation and interest of employees who, as rotating members of the committee become ambassadors of good health and safety among their fellow workers, their families, and their communities.

Quoted from Willoughby, Irene M.: "The Health Committee." *Industrial Medicine and Surgery*, 18:501-502 (December) 1949.

Attitudes of Labor Unions Toward Plant Health Programs

Labor is keenly concerned and recognizes its responsibility in making the health and safety movement a success. Workers are quick to recognize and respond to genuine interest of management in the matter of safety and health control, as shown by the fact that thousands of labor and management agreements contain provisions as to safe work conditions and practices. . . .

Management too often in my own experience has taken the position that matters of health and safety are strictly the business of management and no particular business of the workers. Unfortunately, this attitude on the part of some employers prevents the development of adequate plant safety programs, and naturally causes the workers to suspect that the management agrees in theory but in fact does not accept the principle of employee representation on the matter of safe and healthful work conditions.

Although most employers make no attempt to conceal potential hazards to workers, and supply full protection, there are still a large number of employers who subscribe to the old theory that workers should not be informed of potential health hazards because it will excite or disturb them, and tend to promote absurd claims for damages or compensation benefits. That is the bunk and attitude of the ostrich. It would be more intelligent if employers distributed to the workers all published information on health hazards which are obtainable from governmental agencies, as well as reputable agencies like the Industrial Hygiene Foundation.

Quoted from Watt, Robert J.: "The Role of Employee Health in Industrial Relations." *Proceedings of Sixth Annual Meeting of Industrial Hygiene Foundation of America, Inc.* Pittsburgh, The Foundation, 1941, pages 153-155.

All of our organized labor unions realize, at the same time we are pressing the importance of health and welfare, that labor is far behind management and Government in knowledge and experience in the field of industrial health. The concept of industrial hygiene has

risen through the years because of the work of management groups and governmental agencies. Management realized fairly early that it has economic interests in preventing disease and accidents. Governmental agencies took action to solve industrial health problems because such action was a proper duty of public agencies. But there is no getting around the fact that industrial hygiene is working to improve the health of the worker. You are working basically to improve the workplace and working conditions of the people in the plant—and we are the people in the plant.

That's why it seems to me such a basic fact that labor has a right to participate in industrial hygiene programs. We are the consumers, and we want a share in the determination of what we will get.

Quoted from Burke, Frank: "What Organized Labor Wants from Industrial Hygiene." *Industrial Hygiene Newsletter*, 10:7 (July) 1950.

How many managements truly understand and accept the need for the active cooperation of organized labor in their program? How many solicit the participation of the local union representing their employees in their health and safety organizations? How many of them know what is in the primer of every skilled group worker—that you can't sell people "what's good for them" by exhortation alone? Workers, like everybody else, must have a sense of partnership and responsibility to the shaping and execution of a program, before they come to accept it as their own.

That means joint labor-management health and safety committees. It means facing tensions, rumors and difficulties candidly, rather than repressing or ignoring them. It means the willingness of management to drop its "Papa knows best" attitude. All this requires the collaboration of mature and reasonable people, capable of genuine give and take over the conference table. Managements sincerely interested in the health and safety of their employees will not try to circumvent the channels of cooperation through organized labor by recruiting their own "workers' representatives" on a unilateral basis. They will look to the successful experiences of labor and management in hundreds of plants over the country with their joint plant committees.

Quoted from Bordelon, Myrna S.: "Labor and Industrial Hygiene: the Viewpoints of the C. I. O." *What's New in Industrial Hygiene*, 4: 6-7 (July-September) 1947.

It is my feeling that, in general, labor looks upon the progress of industrial hygiene and medicine with favor and approval. There is a great satisfaction with safety measures, sanitary and hygiene improvements that have taken place during the past 20 years. Perhaps small and weak labor organizations, just as small and struggling manufacturers in some industries, have given little thought to this subject. They both have ignored this important phase in their routine of manufacturing products for good reason. Labor in this category has all it can do to secure contractual arrangements, keep its organization

intact, and obtain good working conditions, standard wages and hours for the workers. . . .

Last year, Mr. Louis Hollander, vice president of the Amalgamated Clothing Workers of America, made the following remarks in discussing this same topic before the members attending this course: "We have in the past sometimes been suspicious of programs of industrial medicine launched and administered by individual employers. Too often such programs have been part and parcel of efforts by employers to hinder the organization of their workers into trade unions. These plans have sometimes gone hand in hand with the familiar pattern of company unions, group insurance, and other paternalistic devices designed by employers to persuade their workers that they have nothing to gain from union organization. Too often such plans have been devised in an attempt to substitute medical care for the wage, hour, and working condition improvements which would result from union organization." . . .

It should be obvious that all phases of industrial medicine are of value to management, to labor and to the public. The objectives of industrial medical programs have been achieved by the establishment and progressive improvement of facilities installed for the protection of the workers in plants and factories. Without such facilities, labor, management and the public would have suffered materially as well as spiritually. Therefore, it is evident that opposition by labor is directed more toward certain practices of this specialty which in some instances may be valid. It is possible that with time such opposition may be overcome through education or modification of the practices questioned.

Quoted from Price, Leo: "Labor's Attitude Toward Industrial Medicine." Long Island College of Medicine Second Postgraduate Industrial Medicine Course. New York, The College (November 11), 1943, pages 1, 4-5, 9.

Labor-Management Relations

Undoubtedly industry and unions will continue to include health and safety provisions in their contracts, perhaps for some years to come. The purpose should be to broaden these provisions to encompass a comprehensive industrial health program in which both management and the workers will participate. As a guide, I should like to suggest that the basic health considerations in collective bargaining should include:

1. A labor-management committee, of equal representation, to advise the union and management on health needs of the workers and on ways and means to meet the needs.
2. In-plant medical services, adequate in scope and quality, and acceptable to both labor and management.
3. Preplacement and follow-up physical examinations conducted under the policies outlined by the report of the Council on Industrial

Health of the American Medical Association and supplemented by careful job analysis for proper placement.

4. Routine industrial health surveys of working conditions by official industrial hygiene agencies or similar disinterested agencies acceptable to the committee.

5. Compliance with recommendations made by the surveying agency for the improvement of working conditions.

6. Promotion of special public health services in the plant for the improvement of individual health, such as nutrition programs, mental health services, dental care, communicable disease control, and health education.

Quoted from Bloomfield, J. J.: "Labor-Management Relationships in Industrial Health Problems." *The Journal of the American Medical Association*, 128: 642-643 (June 30) 1945.

Today the importance of war production demands that every man and woman in industry take part in the fight against accidents and sickness. Organized labor frequently feels about the company safety program the way it has felt about the company union—that both are designed primarily for the benefit of management. Workers feel that they have a special stake in matters of health and safety and that they should have something to say about them. It is for this reason that collective bargaining contracts so often include clauses dealing with health and safety. . . .

About 1,900 joint labor-management production committees were established in war plants all over the country. Three to four hundred of these have special subcommittees on safety and health.

In their efforts to reduce absenteeism, these joint committees have made special efforts to attack the causes of absenteeism. For example, where colds have resulted from poor nutrition, lack of rest, or personal carelessness, the committee members have discussed with their fellow workers the importance of proper eating and sufficient rest, and of caution in the presence of people with colds. Where sickness or injury as a result of working conditions or carelessness has kept workers away from their jobs, the committees have attempted to discover poor plant conditions and have suggested remedial measures to management or have analyzed job methods to eliminate unsafe working habits. . . .

There is a great deal of educating to be done, educating of both labor and management, before we can make any considerable inroads on the accident and sickness toll in industry. A large share of the responsibility for this education falls on the industrial doctor in his contacts with management and labor within the plant. On the management side he can make sure that the company's health and safety policies, implicit in the existence of the medical department, are understood and followed by all the supervisory employees in the plant. He can establish a close working relationship with the personnel office to help determine the job in which each new worker can

achieve peak production. On the labor side he can take positive steps to know the workers and their organizations and to secure their confidence. In the matter of preplacement examinations, for example, he can make a point of discussing with the shop steward or other union officials the purpose of such examinations and the distinction between the preplacement and the preemployment examination. He should make it clear that all medical information resulting from such examinations will be held in strict confidence between the worker and the doctor and will in no way be used to the detriment of the worker but rather to insure his personal well-being and his effectiveness on the job.

One of the most constructive steps the industrial physician can take is to meet with the members of the local union in their own headquarters in order to explain to the workers themselves the purposes and principles of the plant health program and to give them a chance to ask questions and make suggestions. A series of such meetings on various subjects might be held, one on nutrition, one on venereal disease, one on control of the common cold, one on health habits, and so on. If the union has the facilities for a health program for its members and their families, the doctor might well serve as an adviser in setting up such a program.

Quoted from Lund, Wendell: "Employee-Management Cooperation for Industrial Health." Proceedings of the Fifth Annual Congress on Industrial Health, Chicago, January 11-13, 1943. Chicago, The American Medical Association, pages 3-4.

Physicians

Types of Industrial Physicians

Table 90.—Number of surveyed physicians engaged or having experience in industrial practice, by type of practice and amount of time devoted to practice¹

Type of practice	Number of physicians devoting specified amount of time			
	Total	Full time	More than half time	Less than half time
All types.....	4, 086	1, 177	1, 438	1, 471
General industrial practice.....	2, 967	866	1, 079	1, 022
Traumatic surgery.....	677	100	284	313
Occupational disease control.....	24	8	5	11
Plant medical department administration.....	139	103	20	16
Toxicology.....	17	7	2	8
Physical examination.....	115	26	35	54
Health education of employees.....	4	1	2	1
Industrial hygiene teaching.....	5	1	-----	4
Industrial hygiene research.....	8	7	-----	1
Governmental industrial hygiene administration.....	24	20	2	2
Casualty insurance administration.....	18	11	5	2
Workmen's compensation administration.....	49	19	12	18
Civil service medical examinations.....	6	2	2	2
Private industrial hygiene consultant.....	33	6	10	17

¹ Based on partial returns from a special questionnaire sent to a selected list of physicians in 1940, by the Committee on Medical Preparedness and the Council of Industrial Health of the American Medical Association. Of 10,134 schedules mailed out, 6,332 were returned. Of the replies, 4,981 physicians said they were engaged or had experience in industrial practice and completed a schedule; 1,351 indicated they were not engaged or interested in industrial medicine. Omitted from the table are 547 schedules which had not been coded and 348 schedules which did not contain sufficient information for classification.

Source: American Medical Association, Committee on Medical Preparedness. "Physicians in Industrial Practice." *Journal of the American Medical Association*, 116:1452 (Mar. 29) 1941.

Industrial physicians are employed on full-time, part-time, or on call basis, depending upon the type and extent of the company's program.

Full-Time Physicians

In large medical departments, full-time medical directors are primarily administrators. They guide the company in the formulation of policies affecting the health of employees. They supervise and assist medical department personnel in carrying out the objectives of medical programs. In some companies, the medical director is personally responsible for executive health services. In these instances, the director may himself conduct physical examinations and health counseling for executives.

In small units the director of medical services usually performs the regular duties of nonsupervisory plant physicians in addition to supervising the activities of the medical department. Frequently he is the only physician on the staff.

Medical directors or company doctors usually select or approve all persons employed in medical departments. The practice is considered advantageous primarily because the physician is better prepared than the average layman to judge the merits of professional qualifications and experience. Furthermore, his knowledge of personalities is useful in selecting the types of individuals who are best suited to participate in employee health programs. . . .

Part-Time Physicians

The services of part-time physicians are utilized in both large and small companies. . . . Most part-time physicians have private practices. But in order to fulfill their obligations to a company they must be able to arrange their schedules to suit the company's needs. They should have sufficient free time to permit them to be at the company during regularly scheduled hours. They should also have ample time to become acquainted with the over-all health problems of the organization.

Hours for part-time physicians vary widely from company to company. . . . In many organizations, consultations are not conducted on company premises and employees and job applicants must visit the physician's private office. . . . In some companies, part-time physicians do not have regular hours at the company. But they usually communicate with the company daily in order to arrange convenient office hours for employees. In any case, part-time physicians are usually on call for on-the-job accidents.

In some instances, part-time doctors regularly visit the company to observe the operation of first-aid services and to advise nurses and first-aid workers concerning emergency care procedures. They occasionally consult with company executives regarding industrial hygiene and safety.

On-Call Physicians

Many companies that do not have formal medical services maintain lists of physicians who may be called upon when emergencies occur. Their major responsibility is to provide medical attention to injured workers, although in a few instances they examine employees and assist in solving plant health problems.

Physicians are usually selected because they are prepared to handle the types of injuries experienced at the plant and because they are conveniently located for emergency calls. Obviously, availability cannot be stressed since the physician's participation in the program is definite. Several companies which experience minor types of accidents find the arrangement satisfactory. They compile long lists of physicians and have little difficulty contacting doctors when they are needed. Other companies have been less fortunate. During illness peaks some of them have exhausted their entire directories of physicians without success. It is generally agreed, therefore, that some reasonably dependable provision is needed for the care of workers and especially those employed in hazardous occupations.

Medical Service Consultants

While medical service consultants are called upon from time to time, their duties are generally less of an emergency character than those of on-call physicians. They are usually physicians, surgeons,

and industrial hygienists who are requested to: (1) provide medical attention (excluding first aid) for employees suffering from health conditions related to employment which company medical services are not equipped to handle, (2) consult with medical officers on special cases, and (3) confer with and advise company officials on the study and control of working conditions and environment which can affect the health of employees.

Quoted from Spears, Ethel M.: *Company Medical and Health Programs (Studies in Personnel Policy, No. 96)*. New York, National Industrial Conference Board, Inc., 1948, pages 14-16.

Duties, Responsibilities, and Relationships

1. To provide emergency medical care of all employees who are injured or become ill on the job, whatever the cause.

2. To continue treatment of employees suffering from occupational diseases or accidents.

3. To make regular inspections of health and accident hazards in the shops, in cooperation with the safety department, engineering department, or other units, for the prevention of occupational disabilities.

4. To make annual periodic examinations of all employees and executives with a view to helping them improve and maintain health through discovery and correction of ailments which they may not be aware of but which later may impair their health seriously.

5. To make monthly physical examinations, including laboratory tests, of workers who are exposed to poisonous materials on their jobs. Workers with unusual responsibilities, such as cranemen and hoistmen, should be examined every 6 months.

6. To maintain and analyze sickness records in order to know how, when, and where lost time due to disability occurs in the plant; to tabulate these records monthly, according to cause, nature, and duration of disabilities, and department or occupation of the patient.

7. To cooperate with the personnel department, employment office, or other responsible unit, in the proper job-placement of new workers, through the preplacement examination, and at the same time to give new workers the guidance mentioned in No. 4 above.

8. To make sure that employees returning to work after an absence due to illness or injury are capable of working safely and efficiently.

9. To promote and take part in a health education program for employees and their families.

10. To make detailed plans for handling large numbers of seriously injured workers in the event of disaster, such as an explosion, fire, air raid, or other enemy action. Plans should include:

a. Transportation and first-aid care of the injured.

b. Transferral of the seriously injured to hospitals where operating rooms, blood plasma, and blood donors are available.

c. Coordination of these plans with the safety department, guards, police, road patrols, and fire departments.

11. To cooperate with, and if desirable supervise, all other services in the plant which relate to the health of the workers, such as the food service, the welfare service, safety program, and recreation committees.

Quoted from U. S. Public Health Service, Division of Industrial Hygiene: Outline of an Industrial Hygiene Program (Supplement No. 171). Washington, Government Printing Office, 1943, pages 3-4.

Duties of the Physician in Industry

PREVENTION. The physician should acquaint himself by regular inspections with all materials and processes used in the working environment over which he has supervision, to the end that he may recommend appropriate protection of employees from conditions actually or potentially harmful.

INDUSTRIAL PHYSICAL EXAMINATIONS. Preplacement physical examinations should be complete. They should be used only for the purpose of assigning work adjusted to the physical and temperamental fitness of applicants and to maintain safe and healthful employment for all employees.

Subsequent physical examinations should be complete enough to provide positive health protection for all workers and to safeguard the public welfare. Repetition of such physical examinations must be determined by the physician in accordance with specific requirements. In the interest of completeness and uniformity, physical examination forms are recommended. Personal records of this character are confidential and should always be kept in the custody of the medical department. Access to these records should be granted only on request or consent of the examinee.

The examining physician should acquaint the examinee with the results of all examinations or take steps to refer all conditions requiring correction to the physician of the worker's choice.

HEALTH EDUCATION. The plant physician should take advantage of all opportunities for beneficial instruction of the workmen in hygiene living both in and out of the industrial environment.

MEDICAL AND SURGICAL CARE. 1. Treatment of compensable injuries and diseases: The disabled worker should be free to choose his physician from all those licensed doctors of medicine competent to supply the required services. . . .

2. Treatment of noncompensable injuries and diseases: The treatment of injuries or diseases not industrially induced is the function of private medical practice. The physician in his industrial relationships should abstain from such services except in the case of:

- a. Minor ailments. . . .
- b. First aid for urgent sickness. . . .
- c. Rehabilitation after sickness and injury. . . .

General Relationships

THE EMPLOYER. Adequate industrial medical supervision requires full- or part-time service of doctors of medicine, depending on size of plant, location, prevalence of dangerous health exposures and other considerations. In every case a physician's relation to industry is improved if he does not solicit the appointment.

Written contracts between a physician and an employer are usually unnecessary. If a contract seems desirable, a copy should be filed with the local county medical society.

THE EMPLOYEE. Adequate industrial health conservation depends on cooperation from workmen. They must therefore receive the same courtesy and professional honesty as do private patients.

Physicians who serve in industry should not devote time or facilities properly belonging to industrial medical administration to diagnose or treat dependents of employees or members of plant administrative or supervisory staffs, except in the absence of accessible independent private facilities.

INDUSTRIAL NURSES AND NONPROFESSIONAL ASSISTANTS. Industrial physicians should be responsible for the proper instruction and subsequent activities of nurses and other assistants. Their functions should be described in clear and comprehensive written orders posted in the medical department. There should be no delegation of services requiring expert medical attention.

CONSULTANTS. Assistance should be asked of consultants in industrial medicine, surgery or hygiene or in the clinical specialties whenever the interests of the workmen demand it. In the control of working environment the same consulting arrangements should be entered into with industrial hygienists and safety engineers.

OFFICIAL HEALTH AGENCIES. The physician in industry should consider himself as a deputy health officer in practice if not in fact. Assistance from bureaus of industrial hygiene in many State and local governments to control healthful working conditions is available. In return the physician in industry should cooperate by accumulating and reporting compilations of dependable data on the relation of occupation to morbidity and mortality.

WORKMEN'S COMPENSATION AND REHABILITATION AGENCIES. Medical and surgical management in every case of industrial injury or disease should aim to restore the disabled worker to his former earning power and occupation as completely as possible and without unnecessary delay. Concise, dependable medical reports promptly submitted to those agencies entitled to them are a part of this obligation. In the same way, equitable administration of workmen's compensation rests on medical testimony which adheres closely to reasonable scientific deductions regarding the injury or possible sequelae, to the end that every deserving claim may receive full indemnity under the statutes.

MEDICAL ORGANIZATIONS. Physicians in industry should participate in the organizational and educational activities of general and special medical societies and of hospitals to the end that the objectives and contributions of industrial health may be recognized and available to the medical profession at large.

Quoted from American Medical Association, Council on Industrial Health: "Medical Service in Industry: Outline of Procedure for Physicians in Industry." *Journal of the American Medical Association*, 118:895-896 (March 14) 1942.

Qualifications

1. He should be a graduate of an accredited medical school and licensed to practice in the State or Province.
2. He should have at least 1 year's internship in an accredited hospital.
3. He should have some experience in general practice either prior or supplemental to his duties at the plant.
4. He should have a general knowledge of each plant operation, industrial relations, including employment methods and problems, transportation, housing, recreation, educational facilities and methods, and employees' benefit plans.
5. He should be qualified to determine by examination of employees their physical and mental fitness for work.
6. He should have a knowledge of the ingredients and of the toxic or disease producing qualities of all the materials and processes used in the industrial organization which he serves.
7. He should have a knowledge of health education, of sanitation, of working conditions, of accident and occupational disease prevention methods, and of preventive health measures in general.
8. He should have a knowledge of the diagnosis and treatment of occupational diseases.
9. He should be competent in the diagnosis and handling of all traumatic lesions which he undertakes to treat.
10. He should be versed in procedure for follow-up and rehabilitation.
11. He should have a knowledge of the workmen's compensation laws.
12. He should have a knowledge of an efficient medical record system and of statistical methods.
13. He should have an unbiased industrial viewpoint and a confidence-inspiring personality.
14. He should realize that his first duty should always be to the workman whom he examines or treats.
15. He should like people.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, pages 5-6.

Ratio of Physicians to Employees

It is difficult to state how many physicians will be required for an adequate health program. The size of the plant, hazards involved, labor turn-over, the distance to a hospital, availability of physicians in the community, and other factors have to be taken into consideration. It is doubtful if, even in peacetime, many plants with less than 1,000 employees can profitably afford the services of a full-time physician. In view of the shortage of physicians, few plants with less than 2,000 employees, other than those engaged in the production of explosives or ammunition, will have a full-time physician.

It is a mistake to gage the number of physicians or to base a medical program on the requirements of the explosives industry. Because the hazards are not comparable to other war industries, more physicians will be required not only to prevent occupational diseases, but to be available for major catastrophes rarely encountered in industries engaged, for example, in shipbuilding or machining operations. In the explosives industry, the number of physicians will be 1:1,000 to 1:2,000, depending on the size of the plant.

In other war industries, one physician, by conserving his time, may serve as many as 5,000 to 7,000 employees or even more. It would seem advisable, however, for the ratio of physicians to employees not to exceed 1:4,000, especially if the plant covers many acres, and there are a number of substations of the infirmary. The services of the medical director should be augmented by other physicians, some of whom will probably be on a part-time basis.

Quoted from Hedley, O. F.: "Organization of Plant Medical Department." *Manual of Industrial Hygiene* (edited by William M. Gafner). Philadelphia, W. B. Saunders Co., 1943, page 30.

[In its proposed standards and recommendations relative to a preventive medical program in a Federal employees' health service, the U. S. Public Health Service recommends that] the number of physicians per unit of population be one physician for 4,000 to 6,000 employees. This ratio is an estimate based on existing practices in industry, with consideration for the real difference existing between the type of preventive medical program authorized by Public Law 658 and industrial medical programs. The ratio is based on the potential work load of the physician in preventive medical programs.

Factors to be considered in determining a more exact ratio of physicians to population include among others:

- (a) Distribution of employees geographically.
- (b) Shifts worked.
- (c) Extent of industrial hazards present.
- (d) Employee turnover.
- (e) Number of health examinations required.

- (f) Size of employee population.
- (g) Sex and age distribution of the employee group.
- (h) Type of work being done.
- (i) Degree of group isolation from other medical and dental services.
- (j) Degree of accessibility of the health service to the employee.
- (k) Degree of employees' understanding of the purpose and availability of the health services.

Quoted from U. S. Public Health Service, Office of Employees' Health: "A Suggested Plan for a Preventive Medical Program in a Federal Employees' Health Service." Public Health Reports 61: 1645 (Nov. 15) 1946. (Reprint No. 2756.)

Several medical authorities believe that plants which provide periodic health examinations but which have few occupational hazards can function with the following number of physicians:

One part-time or on-call physician for 250 or fewer employees.

One part-time physician for 250 to 1,000 employees.

One full-time physician for 1,000 to 2,500 employees.

Add a part-time physician at or about 2,000 employees.

Two full-time physicians for 2,500 to 5,000 employees.

Add a part-time physician at or about 4,000 employees.

Quoted from: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96.) New York, National Industrial Conference Board, Inc., 1948, page 41.

The Academy [of Occupational Medicine] recognizes that the health hazards and the measures necessary for the prevention of occupational injury and disease differ in various industries. With due allowance for such differences, the number of physicians needed by a given industrial organization can be arrived at generally by consideration of the following weekly requirements:

1. The time required to conduct medical examinations on a schedule which ensures early detection of any illness due to health hazards.
2. The time required for therapeutic procedures.
3. The time required to maintain complete familiarity with plant operations through regularly scheduled visits of inspection.
4. The time required for sanitary inspections and for planning and conducting health education programs.
5. The time required to maintain and study records, make reports and carry out other necessary duties, such as, for example, advising other departments and management on matters relating to health and related subjects, taking necessary action in cases of industrial compensation, etc.

Quoted from American Academy of Occupational Medicine. Professional Qualifications and Standards of Professional Performance and Facilities. The Academy, undated, pages 3-4. (Mimeo graphed.)

Table 91.—Number of physicians specializing in industrial medicine, United States, specified years, 1934–50

Year	Number of industrial physicians—		Year	Number of industrial physicians—	
	Limiting practice	Giving special attention		Limiting practice	Giving special attention
1934.....	232	870	1940.....	404	1,204
1936.....	269	990	1943.....	574	1,489
1938.....	346	1,054	1950.....	947	1,107

Source: American Medical Association, Council on Industrial Health: "Industrial Health: A General Statement of Medical Relationship in Industry," The Journal of the American Medical Association, 114: 15 (Feb. 17) 1940; Cargill, Frank V., Editor: American Medical Directory, Chicago, American Medical Association, 1950, pp. 12-13; and unpublished data compiled by Directory staff. (The 1934-43 classifications relate to industrial surgery; 1950 data to industrial practice.)

Industrial Physicians by State

Table 92.—Number of physicians specializing in industrial medicine, by State, United States, 1940 and 1950 ¹

State	Number of physicians in industrial practice			
	1950		1940	
	Limiting practice	Giving special attention	Limiting practice	Giving special attention
United States.....	947	1,107	404	1,204
Alabama.....	15	8	8	10
Arizona.....	7	6	3	12
Arkansas.....	2	3	2	8
California.....	72	86	30	101
Colorado.....	12	11	1	21
Connecticut.....	30	13	5	15
Delaware.....	12	3	1	2
District of Columbia.....	2	5	2	4
Florida.....	4	8	3	9
Georgia.....	8	10	3	10
Idaho.....	0	1	0	5
Illinois.....	126	153	54	173
Indiana.....	17	34	15	34
Iowa.....	7	13	2	23
Kansas.....	1	9	1	12
Kentucky.....	8	20	4	20
Louisiana.....	7	11	3	11
Maine.....	1	7	0	5
Maryland.....	24	8	10	10
Massachusetts.....	28	30	11	28
Michigan.....	85	53	28	63
Minnesota.....	2	12	2	18
Mississippi.....	0	3	0	4
Missouri.....	20	33	7	35
Montana.....	0	1	0	6
Nebraska.....	2	6	0	5
Nevada.....	1	2	0	4
New Hampshire.....	0	1	1	2
New Jersey.....	50	60	18	44
New Mexico.....	1	2	0	2
New York.....	133	130	66	129
North Carolina.....	4	6	2	5
North Dakota.....	0	1	0	2
Ohio.....	65	61	35	57
Oklahoma.....	15	13	6	15

See footnote at end of table.

Table 92.—Number of physicians specializing in industrial medicine, by State, United States, 1940 and 1950¹—Continued

State	Number of physicians in industrial practice			
	1950		1940	
	Limiting practice	Giving special attention	Limiting practice	Giving special attention
Oregon.....	2	8	1	18
Pennsylvania.....	74	81	37	95
Rhode Island.....	1	6	1	3
South Carolina.....	0	4	1	6
South Dakota.....	0	2	0	0
Tennessee.....	17	13	5	13
Texas.....	21	44	9	55
Utah.....	0	14	1	7
Vermont.....	1	3	0	5
Virginia.....	24	18	7	5
Washington.....	6	19	3	22
West Virginia.....	22	15	5 ¹	15
Wisconsin.....	11	37	11 ¹	44
Wyoming.....	0	4	0	2
Government service.....	7	6	-----	-----

¹ Based on personal data furnished by the physicians where biographical information fulfilled the requirements for such a listing in the Directory.

Source: Cargill, Frank V., Editor: American Medical Directory. Chicago, American Medical Association, 1950, pp. 12-13, and reports compiled by Directory staff.

Consultants in Medical Specialties

SURGEONS. The consultant most frequently called is a surgeon unless the plant physician is already so qualified. In the earlier day when the repair of injuries was the chief concern of the employer, the company doctor was of necessity a surgeon. . . . In the past, many industrial surgeons obtained a great part of their training in surgery in their industrial practice. In the present day this method of attaining competency in surgery is not only obsolete but it is an injustice to the injured workman. Recent medical graduates are now being trained in surgery for a period of years and under adequate supervision before they attempt to treat major surgical cases on their own responsibility. It is of profound importance therefore to the injured workman and to the employer that the plant physician should realize his limitations, referring all cases of trauma that are beyond his ability to a surgeon who is competent in traumatic surgery. . . .

OCULISTS. Second in importance from the standpoint of frequency of consultations are the oculists. . . . Oculists have been used by industry more for treating eye injuries than for making eye examinations. Minor eye injuries are usually treated in the plant dispensary by the plant physician and his assistants, the more serious cases being sent to the oculist at his office or to the hospital under his care. In a similar manner the plant physician and his assistants test the visual acuity, visual fields, and color perception of employees in the course of the routine physical examinations, referring those with visual defects elsewhere for refraction or further care. . . .

ROENTGENOLOGISTS. From an industrial standpoint, a roentgenologist perhaps renders his greatest service in the interpretation of chest, spine, and skull roentgenograms. Many industrial establishments have adopted the practice of including chest X-rays as a part of their preplacement and periodic physical examinations. The proper interpretation of these findings should be delegated to some competent roentgenologist or to some other physician who by his long experience is well qualified to express a reliable opinion. The same is true when other X-rays are indicated, especially of suspected injuries to spines and skulls.

INTERNISTS. When special examinations or therapy are indicated for employees suffering from nonindustrial conditions, the family physician should be consulted. There are instances, however, where the family physician is not adequately equipped to make a thorough health audit of a worker and it becomes necessary to utilize the services of some competent internist who has the necessary clinical and laboratory facilities at his disposal. . . .

OTHER SPECIALISTS. Dermatologists are consulted with increasing frequency particularly in those industrial establishments in which materials are used that give rise to skin manifestations. . . . Neuropsychiatrists are used in examining employees who may be afflicted with mental disturbances or who may have neurological involvements resulting from either disease or injury. Orthopedists are called upon to rehabilitate many disabled workers who would otherwise become public charges when their compensation awards were expended. Public health and industrial physicians whose knowledge, training, and experience have fitted them to be consultants in industrial hygiene, are frequently utilized by industrial organizations in dealing with special industrial hazards. . . .

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws.* Chicago, American College of Surgeons, 1946, pages 8-9.

Nurses

Duties and Responsibilities of the Nurse in Industry

1. Give emergency care for all occupational injuries as authorized by written standing orders signed by the physician in charge.
2. Give treatment for occupational injuries and illnesses under the supervision of the physician in charge.
3. Give emergency care for nonoccupational disabilities and see that the patient is referred to his own physician for further treatment if necessary.
4. Organize and maintain a clean, smooth running, and efficient health service unit.

5. Keep currently informed about plant processes and materials. This can be accomplished by frequent tours through the plant and conferences with department and division heads, foremen, purchasing agents, and others as may be indicated.

6. Participate in preplacement, periodic, and annual medical examinations of workers.

a. Interview workers to explain the purpose of the examination, the procedures, and their significance.

b. Obtain and record personal and occupational history of the worker.

c. Complete as much of the examination as is approved by the physician. This may include making routine tests and measurements, such as height, weight, hearing, visual acuity, urinalyses, dental inspections, taking blood pressure, pulse, temperature and respiration, and obtaining specimens for serological examination and other laboratory tests.

d. Assist physician with physical examination as necessary and chaperone women workers.

e. Confer with worker to interpret medical findings, plant policies for health and welfare, and to assist him in making plans for his necessary care.

f. Make periodic inspections for symptoms and indications of occupational disease, as of employees working with benzene, lead, or other toxic substances.

g. Interview workers in connection with return-to-work permits to assure their fitness for work.

7. Participate in the plant health and safety educational program.

a. Integrate health instruction in the training program for new employees.

b. Do some health and/or safety teaching during each service to the employee.

c. Do follow-up for correction of remediable defects.

d. Give health supervision to workers with chronic conditions and see that they periodically consult their private physicians.

e. Assist in the rehabilitation of employees with physical handicaps.

f. Keep workers informed regarding current local health problems and health programs through the use of posters, pamphlets, movies, or slides, and/or group talks as indicated.

g. Contribute timely health articles to plant publications.

h. Promote and assist in the organization of classes to meet specific needs such as personal hygiene, nutrition, etc.

i. Assist in placement of workers according to physical and mental fitness.

j. Analyze reports for evidence of conditions needing improvement.

- k.* Attend meetings of safety committee.
 - l.* Assist in the promotion and (if necessary) teaching of first-aid courses for employees from each department.
 - m.* Promote the proper use of protective equipment and when indicated demonstrate care of such equipment.
8. Assist with plant sanitation.
- a.* Know the requirements of State factory laws that pertain to illumination, ventilation, cleanliness, eating facilities, and provisions for adequate toilets as well as for rest, wash, and change rooms.
 - b.* Present suggestions to management for the improvement of all phases of plant environment that affect the health and morale of the workers.
9. Participate in plant welfare activities.
- a.* Interpret (or encourage) group sick-benefit, hospitalization, and life-insurance plans.
 - b.* Counsel workers on all health and welfare problems of concern to them.
 - c.* Assist in the development of recreation programs as indicated.
 - d.* Promote and assist in securing and maintaining adequate eating facilities for all employees.
 - e.* Cooperate with all community health and welfare agencies to the end that employees have adequate help in meeting their problems of nonoccupational as well as occupational origin.
10. Maintain in confidential files and regularly analyze employee records and health service reports.
- a.* Maintain an individual record for each employee seen in the health service unit.
 - b.* Record every service rendered to each individual employee on his individual record and use this record as the basis for health counselling.
 - c.* Make compensation reports according to plant policy.
 - d.* Submit daily, weekly, or monthly, and annual reports to plant physician and/or management; and interpret such reports as evidence of accomplishments or as needs for further activities.
11. Keep abreast with developments in science, in industry and in her profession through:
- a.* Active membership in professional and civic organizations.
 - b.* Reading of professional and industrial magazines.
 - c.* Participation in study groups.
 - d.* University study when possible.

Quoted from *The American Association of Industrial Nurses, Inc.: Duties and Responsibilities of the Nurse in Industry.* New York, The Association, 1949. (Approved by the members of the A. A. I. N. during their annual meeting, April 9, 1949.)

Table 93.—Number of registered professional nurses employed full time in industry and types of services rendered, by State and Territory, 1950

State	Total nurses employed	Nurses supplying information		Number rendering specified services			
		Number	Per cent of total	In-plant	Home or visiting nurse	Industrial hospital	Personnel department
United States and Territories:							
Number.....	10,796	7,629	70.6	6,911	206	434	76
Percent of 7,629 nurses.....				90.6	2.7	5.7	1.0
Alabama.....	134						
Arizona.....	35	35	100.0	3	1	31	0
Arkansas.....	19	19	100.0	14	0	5	0
California.....	618						
Colorado.....	46	44	95.7	22	2	17	3
Connecticut.....	441	441	100.0	429	9	0	3
Delaware.....	45	45	100.0	31	0	14	0
District of Columbia.....	268						
Florida.....	56						
Georgia.....	145	145	100.0	136	3	6	0
Idaho.....	3	3	100.0	3			
Illinois.....	1,300	412	31.7	398	14	0	0
Indiana.....	439	439	100.0	414	9	15	1
Iowa.....	99	86	86.9	80	6	0	0
Kansas.....	71	55	77.5	55	0	0	0
Kentucky.....	90						
Louisiana.....	102	102	100.0	56	5	34	7
Maine.....	55	55	100.0	36	3	16	0
Maryland.....							
Massachusetts.....	634	634	100.0	606	14	2	12
Michigan.....	838	838	100.0	822	12	2	2
Minnesota.....	172	172	100.0	145	6	17	2
Mississippi.....	44	44	100.0	28	0	15	1
Missouri.....	271	271	100.0	265	5	0	1
Montana.....	1	1	100.0		1		
Nebraska.....	43	43	100.0	39	0	4	0
Nevada.....	11	11	100.0	3	0	8	0
New Hampshire.....	36	36	100.0	35	0	0	1
New Jersey.....	760	152	20.2	129	11	4	8
New Mexico.....	11	11	100.0	0	0	11	0
New York.....	685	685	100.0	674	10	0	1
North Carolina.....	121						
North Dakota.....	0	0		0	0	0	0
Ohio.....	487	487	100.0	340	16	125	6
Oklahoma.....	46	46	100.0	45	1	0	0
Oregon.....	57	57	100.0	54	0	3	0
Pennsylvania.....	1,034	856	82.8	837	8	1	10
Rhode Island.....	83	83	100.0	83	0	0	0
South Carolina.....	130	130	100.0	109	11	7	3
South Dakota.....	3	3	100.0	2	1	0	0
Tennessee.....	241	241	100.0	231	8	0	2
Texas.....	154	154	100.0	118	16	11	9
Utah.....	34						
Vermont.....	22	22	100.0	18	0	3	1
Virginia.....	89						
Washington.....	107	107	100.0	100	1	6	0
West Virginia.....	171	171	100.0	134	23	13	1
Wisconsin.....	429	396	92.3	393	1	0	2
Wyoming.....	5	5	100.0	5	0	0	0
Alaska.....							
Hawaii.....	92	92	100.0	19	9	64	0
Puerto Rico.....							
2 or more States.....	39						

Source: U. S. Public Health Service, Division of Industrial Hygiene: Reported Number of Registered Nurses Employed Full Time by Industry in the United States and Territories, According to Education and Experience, as of January 1, 1950. (Mimeographed.)

Table 94.—Distribution of nurses employed in surveyed establishments according to type of position ¹

Type of position	Nurses employed	
	Number	Percent
Total nurses employed.....	1, 915	100. 0
Full-time nurses combining in-plant and visiting duties.....	598	31. 2
Part-time nurses combining in-plant and visiting duties.....	12	. 6
Full-time in-plant nurses.....	1, 086	56. 7
Part-time in-plant nurses.....	39	2. 0
Full-time company visiting nurses.....	56	2. 9
Part-time company visiting nurses.....	5	. 3
Head nurses.....	119	6. 2

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M. Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, p. 13.

Table 95.—Distribution of establishments surveyed and of nurses and workers employed, by size of establishment and amount of medical direction ¹

Size of establishment (number of workers)	Number				Percent			
	Total	Physicians serving—			Total	Physicians serving—		
		Full time	Part time	On call		Full time	Part time	On call
Establishments								
Total.....	868	198	324	346	100. 0	100. 0	100. 0	100. 0
Under 500.....	139	3	31	105	16. 0	1. 5	9. 6	30. 4
500 to 2,499.....	501	56	225	220	57. 7	28. 3	69. 4	63. 6
2,500 to 4,999.....	108	47	47	14	12. 5	23. 7	14. 5	4. 0
5,000 to 9,999.....	67	43	17	7	7. 7	21. 7	5. 3	2. 0
10,000 and over.....	53	49	4	-----	6. 1	24. 8	1. 2	-----
Nurses								
Total.....	3, 027	1, 726	728	573	100. 0	100. 0	100. 0	100. 0
Under 500.....	157	3	34	120	5. 2	. 2	4. 7	20. 9
500 to 2,499.....	936	153	425	358	30. 9	8. 9	58. 4	62. 5
2,500 to 4,999.....	409	229	126	54	13. 5	13. 2	17. 3	9. 4
5,000 to 9,999.....	486	349	96	41	16. 1	20. 2	13. 2	7. 2
10,000 and over.....	1, 039	992	47	-----	34. 3	57. 5	6. 4	-----
Workers (in thousands)								
Total.....	2, 367	1, 394	617	356	100. 0	100. 0	100. 0	100. 0
Under 500.....	47	1	11	35	2. 0	. 1	1. 8	9. 8
500 to 2,499.....	614	87	290	236	25. 9	6. 3	47. 0	66. 4
2,500 to 4,999.....	355	188	154	43	15. 0	11. 4	24. 9	12. 1
5,000 to 9,999.....	457	307	110	42	19. 3	21. 9	17. 8	11. 7
10,000 and over.....	894	841	52	-----	37. 8	60. 3	8. 5	-----

¹ Based on a Nation-wide survey in 1942 of 924 establishments, employing approximately 2.5 million workers, conducted by the Committee to Study the Duties of Nurses in Industry, American Public Health Association, with the assistance of the Division of Industrial Hygiene, National Institute of Health. The above tabulation is based on information received from the 868 establishments reporting the employment of at least 1 full-time registered professional nurse.

Source: Whitlock, Olive M., Trasko, Victoria M., Kahl, F. Ruth: Nursing Practices in Industry (Public Health Bull. No. 283). Washington, Government Printing Office, 1944, p. 8.

Qualifications

A. Personal:

1. An intelligent, open mind with good judgment and emotional stability; a healthy attitude toward coworkers, employees, and to the job itself.
2. Good physical health and neat grooming.

B. Professional:

1. Graduation from a school of nursing accredited by the State board of nurse examiners.
2. License to practice in the State or Province.
3. Unless offset by other qualifications, preference should be given to those who have satisfactorily completed courses in industrial nursing.
4. Preference should also be given to those who have had successful extended experience in industry.
5. To keep up to date, participation in professional organizations and subscriptions to one or more of her professional publications are desirable.
6. At least 1 year's experience in the practice of nursing following graduation from nursing school. (Refer to pamphlet "Recommended Qualifications for Industrial Nurses Working Without Nursing Supervision.")

C. Experience:

1. A substantial background in several phases of graduate nursing, any of which might be the operating room, hospital emergency clinics, community agencies or administration. Experience in working with people emotionally or physically handicapped is also desirable.
2. The nurse working alone or in a supervisory position must possess organizing ability and an appreciation of business methods.
3. A knowledge of typewriting and stenography are desirable in instances where clerical aid is not readily available.

The fact that an individual is a graduate registered nurse with at least 1 year of practical experience in nursing is no assurance that she has all the qualities herein outlined. However, the successful growth of industrial nursing has been built on these factors. They have proved their worth.

The industrialist, long experienced in appraising skills and personalities, understands that only a trial period on the job will determine the nurse's adaptability to her task. To this end he will support her in providing suitable working conditions and in establishing clearly her position in the organization. Her work then will reach its maximum usefulness.

Quoted from The American Association of Industrial Nurses, Inc.: *Qualifications of an Industrial Nurse*. New York, The Association, 1945.

Recommended Qualifications for Industrial Nurses Working Without Nursing Supervision

Professional Qualifications:

1. Graduate from a school of nursing accredited by the State board of nurse examiners.
2. Current registration in the State of employment.
3. Minimum of 5 years' experience in nursing as a graduate registered nurse of which at least 1 year has been under direct nursing supervision and preferably in one or more of the following:
 - (a) An industrial medical department.
 - (b) An emergency clinic connected with an accredited hospital.
 - (c) A community health agency such as a health department or visiting nurse association.
4. Some university study and a plan for continued professional development through further study of such courses as: sociology, psychology, English composition, industrial safety, industrial nursing, public speaking, or introductory public health courses.
5. Active membership in professional organizations, particularly the American Nurses' Association and the American Association of Industrial Nurses.

Knowledge and Skills Needed:

1. Thorough knowledge of nursing principles, methods, and procedures.
 2. Skill in performing nursing techniques.
 3. General knowledge of occupational diseases and occupational hazards.
 4. Working knowledge of compensation laws and insurance practices.
 5. Knowledge of community health and welfare resources and how these organizations function, their policies and procedures.
 6. General knowledge of labor and management relations.
 7. Sufficient knowledge of business practice to set up and maintain simple office procedures.
 8. Understanding of the value of records, and knowledge of record keeping.
 9. Ability to inspire confidence and establish rapport.
 10. Interest in and ability to establish and maintain good human relations.
 11. Knowledge of methods of health and safety education and ability to teach.
 12. General knowledge of preventive health measures and community rules and regulations.
- Lacks in these areas of knowledge and skill should be recognized and a plan made for their remedy through
- (a) a planned introductory experience, and

(b) use of nursing consultation service from the company if available, the industrial insurance carrier or the industrial hygiene service of the State or local department of health or labor.

A trial period on the job of 3 to 6 months is especially helpful in determining the adaptability of the nurse to the particular position. During this time, management should provide opportunity for her to learn the plan of organization of the industry, its policies, the various plant processes from raw materials to finished product, and to establish clearly her place within the organization.

Quoted from The American Association of Industrial Nurses, Inc.: Recommended Qualifications for Industrial Nurses Working Without Nursing Supervision. New York, The Association, 1950. (Approved by the members of the A. A. I. N. during their annual meeting, April 27, 1950.)

Industrial Nurses by Type and Experience

Table 96.—Number of registered professional nurses employed full time in industry, and number supplying information on length and types of experience, by State and Territory, 1950

State	Total nurses employed	Nurses supplying information		Number with specified experience										
				Industrial nursing			Public-health nursing			Other nursing				
				Number	Percent of total	Less than 1 year	1-5 years	5 years or more	Less than 1 year	1-5 years	5 years or more	Less than 3 years	3 years or more	
United States and Territories:														
Number.....	10,796	5,675	52.6	539	2,187	2,908	218	336	192	1,104	3,117			
Percent of 5,675 nurses reporting.....				9.4	38.5	51.2	3.8	5.9	3.3	19.4	54.9			
Alabama.....	134													
Arizona.....	35	33	94.3	6	17	10	3	1	1	11	18			
Arkansas.....	19	19	100.0	5	8	6	0	2	0	6	10			
California.....	618	71	11.5	68	3	0	0	0	0	0	0			
Colorado.....	46	44	95.7	6	16	22	1	1	1	13	19			
Connecticut.....	441	205	46.5	5	71	129	8	26	4	23	153			
Delaware.....	45	40	88.9	4	19	15	0	4	2	3	17			
Dist. of Columbia.....	258													
Florida.....	56													
Georgia.....	145	77	53.1		29	48	1	5	8	10	67			
Idaho.....	3	3	100.0	0		2	0	0	0	0	0			
Illinois.....	1,300	412	31.7	29	172	211	43	29	21	99	248			
Indiana.....	439	403	91.8	39	156	208	6	23	16	114	287			
Iowa.....	99	86	86.9	18	37	31	6	4	1	24	55			
Kansas.....	71	55	77.5	10	19	26	3	5	4	12	38			
Kentucky.....	90													
Louisiana.....	102	95	93.1	10	38	29	7	12	6	15	24			
Maine.....	55	55	100.0	4	24	27	2	5	1	10	26			
Maryland.....														
Massachusetts.....	634	531	83.7	23	169	339	6	30	23	41	251			
Michigan.....	838	545	65.0	21	141	383	26	10	9	93	383			
Minnesota.....	172	151	87.8	18	84	49	6	10	4	26	125			
Mississippi.....	44	44	100.0	18	22	4	0	2	1	8	36			
Missouri.....	271	205	75.6	24	87	94	7	15	12	47	138			
Montana.....	1	1	100.0			1					1			
Nebraska.....	43	43	100.0	5	18	20	0	4	0	9	34			
Nevada.....	11	11	100.0	0	4	7								
New Hampshire.....	36	36	100.0	1	19	16	0	2	1	1	35			
New Jersey.....	750	152	20.2	3	47	102	7	18	2	53	99			
New Mexico.....	11	11	100.0	6	3	2				5	6			

Table 96.—Number of registered professional nurses employed full time in industry, and number supplying information on length and types of experience, by State and Territory, 1950—Continued

State	Total nurses employed	Nurses supplying information		Number with specified experience										
				Industrial nursing			Public-health nursing			Other nursing				
				Number	Percent of total	Less than 1 year	1-5 years	5 years or more	Less than 1 year	1-5 years	5 years or more	Less than 3 years	3 years or more	
New York.....	685													
North Carolina.....	121													
North Dakota.....	0	0		0	0	0	0	0	0	0	0	0	0	0
Ohio.....	487	471	96.7	29	140	281	11	18	18			82	233	
Oklahoma.....	46	46	100.0	8	1	37								
Oregon.....	57	57	100.0	4	31	22	1	0	1	15	19			
Pennsylvania.....	1,034	425	41.1	24	174	227	5	21	7	66	99			
Rhode Island.....	83	83	100.0	6	37	40	7	5	6	21	60			
South Carolina.....	130	87	66.9	3	50	34	6	14	9	26	53			
South Dakota.....	3	3	100.0	0	3	0	0	0	0	0	0			
Tennessee.....	241	241	100.0	31	130	80	8	17	5	61	128			
Texas.....	154	154	100.0	27	66	61	22	9	4	26	102			
Utah.....	34													
Vermont.....	22	22	100.0	0	8	14				7	15			
Virginia.....	89													
Washington.....	107	107	100.0	5	52	50	2	5	2	21	74			
West Virginia.....	171	162	94.7	15	58	89	0	6	8	11	7			
Wisconsin.....	429	396	92.3	44	192	160	19	25	14	126	210			
Wyoming.....	5	5	100.0		3	2			1	2	3			
Alaska.....														
Hawaii.....	92	88	95.7	20	38	30	5	8	0	17	44			
Puerto Rico.....														
2 or more States.....	39													

Source: U. S. Public Health Service, Division of Industrial Hygiene: Reported Number of Registered Nurses Employed Full Time by Industry in the United States and Territories, according to Education and Experience, as of January 1, 1950. (Mimeographed.)

Ratio of Nurses to Employees

The minimum block of nursing time in a plant at one time should be 2 hours for any plant of more than about 35 workers. The maximum and frequency will depend upon the plant need, the interest of management, and the medical service available. . . .

A ratio of 1 hour of physician time to 3 hours of nurse time has worked out satisfactorily in some plants and has been the goal toward which others are working. The nurse should be in the plant when the doctor is there. A ratio of 3 hours of doctor's time to 9 hours of nurse's time per 100 workers is desirable and necessary when comprehensive preplacement and periodic physical examinations are done.

Quoted from National Organization for Public Health Nursing, Committee on Part-Time Nursing: "Hours of Service." Part-Time Nursing in Industry—As Provided by Visiting Nurse Associations in the United States. New York, The Organization. (Undated.) Page 28.

The number of nurses employed should depend on the type of industry and the number of workers. For the maintenance of complete health service in an industry it was recommended that there be 1 nurse for up to 300 employees, 2 or more nurses for up to 600 employees, and 3 or more nurses up to 1,000 employees, 1 nurse for each

additional 1,000 employees up to 5,000, and 1 nurse per each additional 2,000 employees. Additional nurses may be required because of hazards present in a particular plant and to supply service for second and third shifts. This number will be reduced in inverse ratio to the number of technical and nonprofessional workers employed in the medical department. Smaller industries (those employing less than 500 workers) which do not have serious occupational hazards may find part-time nursing services adequate.

Quoted from American Public Health Association, Committee to Study the Duties of Nurses in Industry: "Duties of Nurses in Industry." American Journal of Public Health, 33: 876 (July), 1943.

Table 97.—Average number of workers per nurse in 614 surveyed establishments classified according to number of nurses employed per establishment¹

Number of nurses employed per establishment	Number of establishments	Number of workers	Average number of workers (arithmetic mean)	
			Per establishment	Per nurse
Total.....	614	970, 977	-----	9 700
1 nurse.....	356	306, 773	862	862
2 nurses.....	85	113, 692	1, 337	669
3 nurses.....	75	166, 321	2, 218	739
4 nurses.....	42	101, 273	2, 411	603
5 nurses.....	22	86, 607	3, 937	787
6 nurses.....	9	45, 656	5, 073	846
7 nurses.....	12	72, 079	6, 007	858
8 nurses.....	6	31, 743	5, 290	661
9 nurses.....	7	46, 833	6, 690	743

¹ Based on a Nation-wide survey in 1942 of 924 establishments, employing approximately 2.5 million workers, conducted by the Committee to Study the Duties of Nurses in Industry, American Public Health Association, with the assistance of the Division of Industrial Hygiene, National Institute of Health. The above tabulation is based on information received from the 838 establishments reporting the employment of at least 1 full-time registered professional nurse. Excluded from the table are establishments employing more than 9 nurses each and all establishments supplementing nursing staffs with technicians, nonprofessional and other attendants.

² This average is computed by dividing the number of workers (970,977) by the number of nurses (1,278) in the 614 plants.

Source: Whitlock, Olive M., Trasko, Victoria M., Kahl, F. Ruth: Nursing Practices in Industry (Public Health Bull. No. 283). Washington, Government Printing Office, 1944, p. 37.

Table 98.—Number of plants receiving service from visiting nurse agencies, by nursing hours per week and size of plant¹

Nursing hours per week (per 100 employees)	All plants	Number of plants in specified employee size class		
		Less than 250	250-499	500 and over
Total.....	75	32	28	15
Less than 2.0.....	26	8	11	7
2.0 to 4.9.....	25	12	10	3
5.0 to 9.9.....	13	6	3	4
10.0 to 14.9.....	7	3	4	-----
15.0 and over.....	4	3	-----	1

¹ Based on a questionnaire sent in 1945 by the Committee on Part-Time Nursing Service to Industry, National Organization of Public Health Nurses, to visiting nurse agencies which had provided part-time nursing service to industrial establishments for a year or more. 25 agencies submitted comprehensive data.

Source: National Organization for Public Health Nursing, Committee on Part-Time Nursing Service to Industry: "Hours of Service." Part-Time Nursing in Industry—As provided by Visiting Nurse Associations in the United States. New York, The Organization. (Undated.) p. 26.

Industrial Nurses by State

Table 99.—Number of registered professional nurses employed full time in industry, by State and Territory, for specified years, 1946–50

State	Nurses employed				
	1950	1949	1948	1947	1946
United States and Territories, total.....	10,796	10,688	9,565	9,381	8,907
Alabama.....	134	134	130	122	136
Arizona.....	35	36	-----	27	60
Arkansas.....	19	11	-----	39	3
California.....	618	1 602	1 533	530	383
Colorado.....	46	44	38	39	47
Connecticut.....	441	425	390	388	1 450
Delaware.....	45	43	29	53	26
District of Columbia.....	1 258	258	1 222	1 288	1 253
Florida.....	56	48	26	-----	-----
Georgia.....	145	80	140	140	126
Idaho.....	3	3	4	3	6
Illinois.....	1 300	1 300	1 100	1 052	1 000
Indiana.....	439	480	1 379	1 475	452
Iowa.....	99	91	85	78	88
Kansas.....	71	61	56	58	60
Kentucky.....	1 90	1 60	-----	86	1 50
Louisiana.....	102	78	-----	82	1 100
Maine.....	55	51	49	58	1 25
Maryland.....	-----	173	1 190	1 172	100
Massachusetts.....	634	826	759	509	503
Michigan.....	838	875	880	841	815
Minnesota.....	172	159	145	146	150
Mississippi.....	44	39	38	40	62
Missouri.....	271	262	254	320	1 145
Montana.....	1	1	1	1	1
Nebraska.....	43	40	39	32	19
Nevada.....	11	14	16	26	40
New Hampshire.....	86	40	47	39	400
New Jersey.....	1 750	695	1 447	447	1 400
New Mexico.....	11	1	-----	-----	3
New York.....	685	1 602	1 637	553	699
North Carolina.....	1 121	121	151	109	35
North Dakota.....	0	0	-----	1	2
Ohio.....	487	1 430	1 366	570	465
Oklahoma.....	46	48	29	35	41
Oregon.....	57	57	58	55	68
Pennsylvania.....	1,034	1 842	1 896	565	1 800
Rhode Island.....	83	98	93	20	72
South Carolina.....	130	137	123	95	92
South Dakota.....	3	3	3	2	2
Tennessee.....	241	239	1 201	208	208
Texas.....	154	118	122	154	148
Utah.....	34	26	19	30	33
Vermont.....	22	24	23	28	24
Virginia.....	1 89	89	-----	92	1 64
Washington.....	107	147	123	108	115
West Virginia.....	171	175	165	139	129
Wisconsin.....	429	437	482	447	390
Wyoming.....	5	7	7	8	7
Alaska.....	-----	-----	-----	-----	-----
Hawaii.....	92	80	90	87	-----
Puerto Rico.....	-----	-----	-----	54	-----
2 or more States.....	39	1 78	-----	-----	-----

¹ Figure incomplete.

² Number carried from 1947 count.

³ Estimate.

⁴ Number carried from 1949 count.

⁵ Nurses employed in health services of Government agencies only.

⁶ Consultants employed by official health agencies also appear on the count of public-health nurses.

⁷ Number from current American Nurses Association census of registered nurses.

⁸ Richmond census only.

Source: U. S. Public Health Service, Division of Industrial Hygiene: Reported Number of Registered Nurses Employed Full Time by Industry in the United States and Territories, according to Education and Experience, as of January 1, 1950. (Mimeographed.)

Standing Orders

Standing orders represent a preliminary understanding between physician and assisting personnel about routine conduct of a medical service. In establishing such orders in an industrial medical department, several considerations need to be borne in mind:

1. The greater the amount of personal supervision exercised by the physician directly in the industrial environment, the better is the industrial health service.

2. Standing orders cannot be written to meet every situation likely to arise in industry. They must be modified to meet specific requirements and in accordance with the training and professional competence of the assisting personnel. They should be signed by the supervising medical authority and posted prominently in the medical department.

3. The nurse in industry should assume no responsibility for service outside the field of her professional training. This applies particularly to individual case management, from which the nurse should rigidly abstain except:

(a) In emergencies demanding immediate independent judgment and action.

(b) Procedures of preliminary or first-aid nature routinely required by reason of the nature of the work and which are clearly stipulated in the standing orders.

Quoted from American Medical Association, The Council on Industrial Health: "Standing Orders for Nurses in Industry." *The Journal of the American Medical Association*, 122: 1247-1249 (Aug. 28), 1943.

Industrial Hygiene Engineers, Chemists, Dentists, and Other Professional Personnel

Duties of Industrial Hygiene Engineers and Chemists

To carry out the details of the industrial hygiene control of occupational health hazards is the function of the industrial hygienist or, in some cases, the industrial hygiene engineer. His job requires him to familiarize himself thoroughly with the location and scope of industrial operations, the personnel and working times involved and the materials employed. He conducts plant hygiene surveys which consist of "taking periodic inventory of unsatisfactory occupational risk." He compiles a list of all materials used in the manufacturing process, included in which will be the constituents, if known, and their toxic potential. He understands and is able to locate and identify all manufacturing operations, following the material from new substances to finished product. He inspects the work areas to determine if the conclusions drawn from the compilation of materials used relative to toxicity are valid and if other processes or environments, presumably innocent from the hazard standpoint, are actually so when inspected. He records in permanent file a description of all materials, processes and working environments that may produce disability and the number and occupational type of employees exposed.

He verifies preliminary estimates of the extent of exposure to toxic materials by qualitative or quantitative analyses of the suspect materials or environmental air, using industrial hygiene sampling or measuring instruments. He makes spot determinations of certain hazardous materials such as carbon monoxide, methyl bromide or mercury, and, with others such as lead or solvent vapors, he collects samples of the contaminated air in the workrooms for chemical analysis. In addition to active sampling, he studies the illumination, ventilation, general housekeeping and sanitary conditions, the latter including washing, waste disposal, drinking water, eating, and change room facilities. Following analysis, he determines if health hazards exist by comparison of the laboratory findings with the established safe working levels of toxic materials in the air; in addition to these comparisons, he consults with the medical director to learn if positive clinical findings exist that may parallel any abnormal results encountered in air studies.

He plans control measures predicated on the analytical results, through one or more of the recognized protective measures. He plans

the basic designs of exhaust ventilation, either local or general, and cooperates with the plant engineers in developing construction plans for ventilating systems.

He prepares and submits reports descriptive of the hygiene studies, interpretations of the findings, recommendations for the abatement of environmental hazards and nuisances and findings on follow-up visits and inspections.

He is responsible for a certain amount of maintenance of the industrial hygiene testing equipment and for the forwarding of air samples to the laboratory for analysis. He conducts a certain portion of the health education program by meeting with supervisory personnel and explaining the goals of an industrial hygiene engineering service.

The industrial hygiene chemist who works in conjunction with the engineer performs the analytical laboratory work. He analyzes quantitatively atmospheric samples for dusts, gases, fumes, mists, vapors and other air contaminants. He carries out analytical procedures on industrial chemicals and other substances as required. He analyzes samples of blood and urine for the presence of various toxic materials such as lead, cadmium, or carbon monoxide. He conducts also certain dust counting procedures. He determines concentrations in parts per million of toxic substances in air samples.

Quoted from Felton, Jean Spenser: "Careers in Industrial Hygiene." *Occupational Trends*, 1: 10-11 (May-June) 1960.

Duties, Qualifications, and Relationships of Industrial Dentists

MINIMUM RECOMMENDED SERVICES. [Editor's note: Prepared by the American Dental Association, Council on Dental Health.]

1. Preplacement and periodic oral examination and diagnosis of all employees.
2. Emergency treatment and the treatment of occupational accidents and illnesses affecting the oral tissues.
3. Treatment and elimination of oral sepsis.
4. Adequate recording of findings and recommendations.
5. Referral of the worker for further remedial and restorative care.
6. Dental health education.

QUALIFICATIONS. The six recommended dental services can be applied in any type of industry, large or small, but the successful application depends in a great measure on the qualifications of the dentist who is responsible for the operation of the program. In addition to his educational qualifications attested by a license to practice dentistry, he should be well informed in several matters that

are essential when industrial groups are considered. Some of these may be listed as follows:

1. *Administration*.—He should be capable of setting up the necessary dental office facilities and organizing a dental program that fits conditions in the plant in the industrial health service of which his program is a part. He should be capable of organizing and administering the activities of the personnel who are under his direction.

2. *Occupational hazards*.—He should become familiar with the processing operations in the plant, the job activities, and the etiology and control of the potential toxic and other occupational hazards to which individual workers are exposed. He should be able to recognize the oral manifestations of occupational disease as well as the primary or secondary lesions of any type of oral pathosis.

3. *Compensation Laws*.—He should be familiar with the compensation laws of the State in which he is located.

4. *Oralogy*.—He should be able to integrate his work and findings with those of the medical services of which his program is a part and so develop dental record forms that the information will supplement the medical findings and provide statistical data for plant health evaluation.

5. *Oral surgery*.—He should be skilled in exodontia, minor oral surgery, and fracture techniques.

6. *Roentgenology*.—He should be skilled in roentgenologic techniques and interpretations.

7. *Education and public relations*.—He should have knowledge of educational techniques both for the individual and for groups. He should believe that the successful operation of the dental aspects of industrial health services depends not on isolationism but on the cooperative efforts of all.

Quoted from Heacock, Lyman D.: "Dental Relations in Industrial Health Service." *Industrial Medicine*, 16: 5-7 (January) 1947.

Relationships of the Industrial Dentist

A plant large enough to support a dental service is highly organized. There are various divisions, activities, and interests functioning together under the direction of management. The dentist is by training and tradition an individualist. If the industrial dentist confined his attention entirely to his relatively narrow field, if he neglected to familiarize himself with the over-all problems of the organization of which he was a part, if he failed to acquaint management with the significance and progress of the dental program or to gain the interest and support of the medical and other professional personnel, he probably was unable to function so that his work constituted one of the organized activities.

That some industrial dentists were remiss in acquainting themselves with the over-all problems of their plants is indicated by the statement of a dental leader of the period. He advised that "the

dentist is not concerned with the conditions under which men work, such as ventilation, illumination, sanitation, safety devices, and so forth." It is true that the industrial dentist is not directly responsible for the detection, prevention, and correction of the cited health hazards; but such indifference to them as is suggested by the dentist quoted certainly would not be conducive to the most cordial relations between the dentist and others concerned with the industrial health program. The industrial dentist should be familiar with all health hazards of his plant and should be prepared to discuss them intelligently with the other members of the organization.

Quoted from East, Bion R.: "Industrial Dentistry." *The Journal of the American Dental Association*, 32: 1280 (Oct. 1), 1945.

All of the work he [the industrial dentist] accomplishes will have to be in addition to a good job of getting along with people. Naturally he will strive to please the patients, but there are others to be considered. The plant manager, superintendent, owner, or whatever the title of the head man is, will have to be considered. He will be interested in whether the dental department uses the clerical staff or telephone too much, do they conserve lights, do they follow and observe any and all of the hundred and one rules that are a part of any organization, and the plant dentist can't afford to get professional and figure that he is above ordinary rules.

The industrial dentist will have to work closely with the industrial relations man of the concern. In industry, difficulties you may have with a patient are not, as in private practice, strictly between you and the patient. They are a matter for consideration of all and, as such, the industrial relations department frequently must be called into consultation.

The unions and their officials also will have something to say about the industrial dental practice. However, if the plan is worked wisely, their main concern will be to amplify it.

The last, but probably the most important, individual having contact with the dental department is the company physician. He may be the immediate superior to the dentist or the departments may be separate, but regardless, the utmost cooperation and good will must exist between the physician and the dentist. They can be of the greatest help to each other. I do not believe that in any case the dentist should subordinate his knowledge or judgment on strictly dental matters to the physician even though he may be working for the physician. The physician, however, has charge of the dispensary, its rules, and the patient's health. No industrial dentist who wants his department to succeed will challenge the rights of the physicians in those fields.

Quoted from Misher, K. W.: "Practical Application of an Industrial Dental Program." *Industrial Medicine*, 15: 114 (February) 1946.

Ratio of Dental Personnel to Employees

In a plant of 5,000 employees with a fairly complete service, yearly examinations alone will mean more than 5,000 appointments, depending on labor turnover. Add to this another 3,000 emergency treatments, 10,000 service appointments and perhaps another thousand miscellaneous visits, and we have a total of 19,000 visits to the dental office. If each dentist handles 25 patients in a day, 3 dentists would be required working 8-hour days to complete such a program.

Quoted from Misher, K. W.: "Practical Application of an Industrial Dental Program." *Industrial Medicine*, 15: 113 (February) 1946.

It may be roughly estimated that an organization employing 2,500 workers, not particularly exposed to substances affecting the mouth and teeth, could operate a dental clinic consisting of a part-time supervising dentist, a full-time dental hygienist, and a single chair with dental unit. One full-time hygienist can perform from 1,800 to 2,400 cleansings per year if clerical assistance is provided to keep the necessary records so that she may devote her entire time to this work.

Quoted from Metropolitan Life Insurance Co., Industrial Health Section: *Industrial Dental Service* (Industrial Health Series No. 3). Page 23. Undated.

SECTION VI

Facilities, Equipment, Records, Costs, and Values of Plant Health and Medical Services

Facilities and Equipment

Location and Layout of Facilities

The medical department should be so located as to be easily accessible and near the greatest number of employees. Cleanliness, ample light and ventilation, and freedom from excessive noise and vibration should be given due consideration in determining its location. It should be connected with or be adjacent to the employment and safety departments if possible in order to facilitate prompt physical examinations of applicants, the mutual use of clerical service, if necessary, and the interchange of ideas and plans relative to employment, accident, and health problems. Many industrial organizations have found it advantageous to have the medical department located near the main entrance in order that physical examinees and injured workers who are off duty but under treatment may come and go without really entering the plant. . . . A minimum of three rooms consisting of a waiting room, a treatment room, and a room for consultation or for making physical examinations is recommended. Rooms for special purposes can be added according to the needs and size of the company. The waiting room need not be very large if the return visits are distributed throughout the day so as to prevent congestion and unnecessary loss of time. Applicants for employment waiting for physical examinations should not mingle with the injured workmen.

A common mistake made a number of years ago by employers was the provision of elaborate and costly operating rooms in their dispensaries. Except in a few large and semi-isolated plants such operating rooms have seldom or never been used from the time they were set up. Facilities for treating minor injuries in the dispensary are indicated but employees suffering major injuries should be taken to a hospital where better results can be obtained.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1948, pages 14-16.

Good industrial medicine can be practiced in any location in the plant that can be kept clean and that provides privacy. However, repeated experience indicates that the medical unit commands respect only if careful attention is paid to suitable and efficient housing, appearance, and equipment. A space 12 by 20 feet is recommended as a basic unit, divided into two rooms, one a little larger for general use. The smaller room can conveniently be set up as a center for physical examinations, record room, and physician's office. Partitions should insure complete privacy. Some authorities recommend that space for a waiting room be included as a basic requirement, a need which becomes more apparent in the larger plant. The entire unit should

be painted in light colors and kept spotlessly clean. The dispensary should be adequately heated. Proximity to toilet facilities is a great convenience. Suitable provision should be made for men and women if both are employed.

Quoted from American Medical Association, Council on Industrial Health: "Medical Service in Industry: The Industrial Medical Department." *Journal of the American Medical Association*, 117: 34-35 (July 5) 1941.

Although one-room medical units are used in some establishments, medical authorities generally recommend a minimum of three rooms. These consist of a waiting room, a treatment room, and an examination or consultation office. This arrangement has several advantages. It permits adequate space for handling ill and injured workers and through segregation, expedites the work of the attendants. It provides greater privacy and also prevents uninjured persons from observing accident conditions and treatments which might upset them. Careful schedule planning and efficient arrangement of equipment are often considered more important than room dimensions. For instance, large waiting and examination rooms are not usually needed if appointments are staggered throughout the day. A single nurse can often supervise several activities if her working unit is well planned. . . . It is not generally considered practical to divide the treatment room into small cubicles even though various types of treatments are given. Cubicles tend to waste space and often create lighting and ventilation problems. Yet separate space for the care of eye conditions is occasionally provided, primarily to prevent interference with the delicate procedures related to eye treatments.

Quoted from Spears, Ethel M.: *Company Medical and Health Programs (Studies in Personnel Policy, No. 96)*. New York, National Industrial Conference Board, Inc., 1948, pages 6-7.

The first-aid room should have a floor area of at least 100 square feet—preferably 200 or more square feet. It is well that it be so located with regard to various departments of the plant, elevator service, or stairs as to be quickly and readily accessible. It should, if possible, assure quiet and privacy. It should be well lighted by windows, thoroughly ventilated, and well heated. For larger organizations, the provision of a waiting room is recommended.

It is highly desirable to have toilet facilities available near the first-aid room, including toilets and lavatories. The first-aid room should be supplied with running water, both hot and cold if possible, and with drainage. It should have good general artificial illumination and a number of electric outlets for supplementary illumination or heating appliances.

Quoted from Metropolitan Life Insurance Co., Industrial Health Section: *First-Aid Service in Small Industrial Plants (Industrial Health Series No. 1)*. New York, The Company, (circa 1947), page 7.

Establishments by Size and by Type of Facilities

Table 100.—Percent of surveyed establishments with specified types of equipment and facilities, by size of establishment, 1945-47¹

Size class (number of employees)	Number of establishments	Percent of establishments providing equipment and facilities for—					
		Surgery		Illness		X-ray	Clinical laboratory
		Major	Minor	Major	Minor		
All plants..	278	3.9	51.2	6.7	54.8	28.4	32.4
Under 500.....	43	2.3	30.2	2.3	41.8	6.9	13.9
500 to 999.....	49	2.0	38.8	4.1	45.0	14.3	18.3
1,000-1,499.....	50	0	50.0	0	56.0	16.0	30.1
1,500 to 1,999.....	17	11.8	70.7	11.8	70.7	35.4	35.4
2,000 to 3,999.....	42	2.4	62.0	7.1	64.2	35.7	42.9
4,000 to 9,999.....	43	2.3	65.2	9.3	58.3	51.2	46.6
10,000 and over...	34	14.7	56.0	20.6	58.8	53.0	50.0

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about a fourth of whom were women. About 5 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 13.

Table 101.—Percent of medical dispensaries with specified type of space, in 1,546 surveyed establishments classified according to size¹

Item	Size class (number of employees)								
	1-249	250-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-6,999	7,000-9,999	10,000 and over
Number of dispensaries surveyed.....	53	193	393	417	163	149	70	46	62
	Percent of total dispensaries in size class								
Dispensaries with:									
Preplacement waiting room.....	0	0	0	0	0	3	4	4	11
Preplacement examining room.....	0	0	0	0	0	5	7	9	11
Waiting room for employees.....	31	27	42	53	67	70	79	75	85
Doctor's office and examining room.....	13	11	21	34	45	62	67	78	73
Treatment room.....	100	100	100	100	100	100	100	100	100
Examining room.....	15	18	28	41	48	47	70	73	66
Dressing room or cubicles.....	0	4	6	10	15	10	21	11	24
Bed or recovery room.....	21	23	41	50	58	61	63	64	68
Bed or cot space.....	20	20	18	19	16	10	9	9	2
Operating or emergency room.....	0	0	2	6	12	14	21	13	40
Eye, or eye, ear, nose and throat room.....	0	0	2	6	9	8	34	22	23
Physiotherapy room.....	0	2	2	10	15	18	23	40	35
X-ray and dark room.....	0	3	7	14	22	24	34	53	56
Laboratory room or space.....	6	2	10	17	22	31	39	60	63
Toilet facilities.....	8	12	17	24	34	28	21	38	37
Nurse's room or office.....	0	2	3	9	12	14	14	20	23
Record room or office.....	6	2	5	9	9	14	26	27	35
Electrocardiograph and/or E. M. R. room.....	0	0	0	0	0	0	3	9	5
Pharmacy or drug room.....	0	0	2	0	3	4	7	9	6
Sterilizing room.....	0	0	0	3	4	7	9	16	18
Dental office.....	0	2	2	6	12	13	11	22	21

¹ Based on findings by the American College of Surgeons during the 10-year period 1935-1945. The size of dispensaries varied from 1 room to various combinations of several rooms. The above table lists every type of room which was recorded at the time of the survey, with the exception of supply rooms and cabinets.

Source: Hess, Gaylord R.: Medical Service in Industry and Workmen's Compensation Laws. Chicago American College of Surgeons, 1946, p. 15.

Table 102.—Number of medical dispensaries with specified type of equipment, in 200 surveyed establishments classified according to size¹

Item	Size class (number of employees)								
	1-249	250-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-6,999	7,000-9,999	10,000 and over
Number of dispensaries surveyed.....	3	16	40	53	34	23	8	9	14
Dispensaries equipped with:									
Scales.....	2	14	24	43	24	22	7	9	14
Snellen chart.....	2	11	24	29	29	19	5	7	13
Binocular apparatus (vision tests).....	0	1	3	14	4	4	2	2	4
Sterilizer.....	3	14	38	49	33	23	8	9	14
Autoclave.....	1	2	7	16	12	12	6	8	12
Other steam or oven sterilizer.....	0	0	0	2	0	0	0	0	0
Hot plate.....	0	2	9	8	2	1	0	0	0
Heat lamp.....	2	8	21	33	28	17	6	9	14
Ultraviolet lamp.....	0	2	5	6	8	3	3	5	8
Short wave diathermy.....	0	2	5	11	7	11	4	5	9
X-ray.....	0	1	5	8	7	8	5	6	13
Fluoroscope.....	0	0	0	0	0	0	0	0	0
Electrocardiograph.....	0	2	0	4	1	2	0	1	2
B. M. R. apparatus.....	0	0	0	2	1	1	0	1	1
Galvanic apparatus.....	0	0	0	0	0	0	1	1	2
Whirlpool bath.....	0	1	0	0	2	1	2	2	4
Foot tub.....	1	3	7	10	10	8	2	7	11
Hot soak basins.....	2	10	27	45	25	18	8	9	14
Electric baker.....	1	0	0	2	3	0	1	0	0
Steam baker.....	0	0	0	0	1	1	1	0	0
Mechanical exerciser.....	0	0	0	0	1	0	0	1	1
Laboratory (urinalysis).....	1	8	18	22	14	14	1	0	2
Laboratory (complete).....	0	0	3	6	0	2	4	8	12
Cots.....	2	8	22	35	23	16	7	8	13
Cots, couches, padded tables.....	1	2	7	7	1	3	3	1	0
Resuscitation apparatus.....	0	2	4	8	5	5	1	2	4
Nebulizer (air).....	0	0	0	1	3	0	0	0	0
Dental equipment.....	0	0	0	1	3	1	0	1	4

¹ Based on findings by the American College of Surgeons. The dispensaries were located in establishments surveyed by the college during the latter part of the survey period 1929-45. The above tabulation does not include items of furniture, such as operating and examining tables, treatment and other chairs, stools, dressing tables, drug and dressing supplies, desks, record files, eye lamps and magnifiers, instruments, wash bowls, etc., all of which are a part of most dispensaries. Tabulations of the use of fluoroscopes were omitted as the early survey of this group made mention of only the X-ray facilities when present, without designating fluoroscopes separately. Such facilities were seen principally in the larger size groups of industries and in those where chest pathology may be imminent or where extensive health or diagnostic programs were conducted.

Source: Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, p. 20.

Table 103.—Percent of 156 surveyed establishments providing specified type of medical facility¹

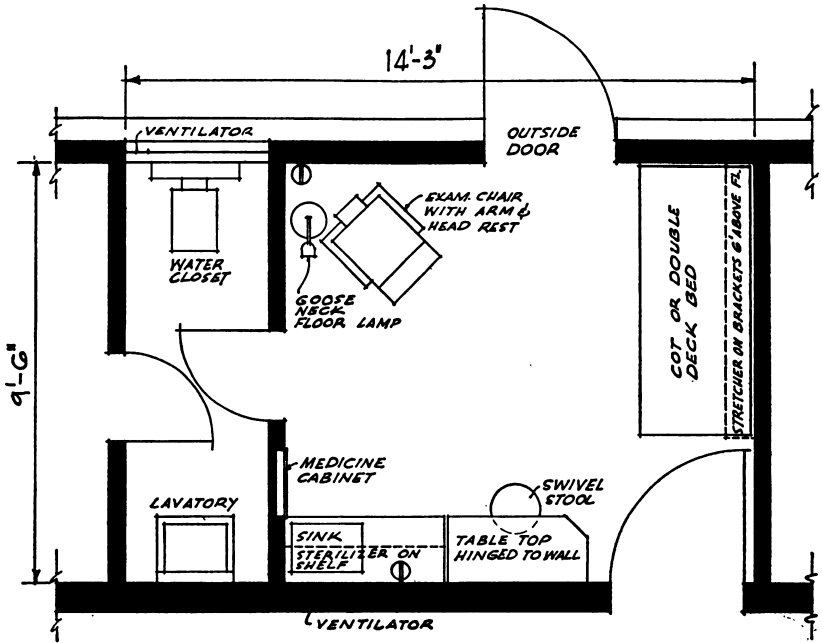
Type of medical facilities provided	Percent of establishments reporting specified facility	Type of medical facilities provided	Percent of establishments reporting specified facility
First-aid room.....	92.9	Basal metabolism equipment.....	5.1
Infrared lamp.....	66.0	Diathermy machine.....	5.1
Ultraviolet lamp.....	51.3	Operating room.....	5.1
Eye-testing equipment.....	47.4	Dental equipment.....	4.5
X-ray.....	34.6	Dental X-ray.....	3.8
Cardiograph.....	19.9	Ambulance.....	3.2
Oxygen tents.....	5.1	Ward in local hospital.....	1.9

¹ Based on returns from a questionnaire sent to 52 companies by the Industrial Relations Counselors, Inc., in 1946; 45 companies (156 establishments) answered the inquiry.

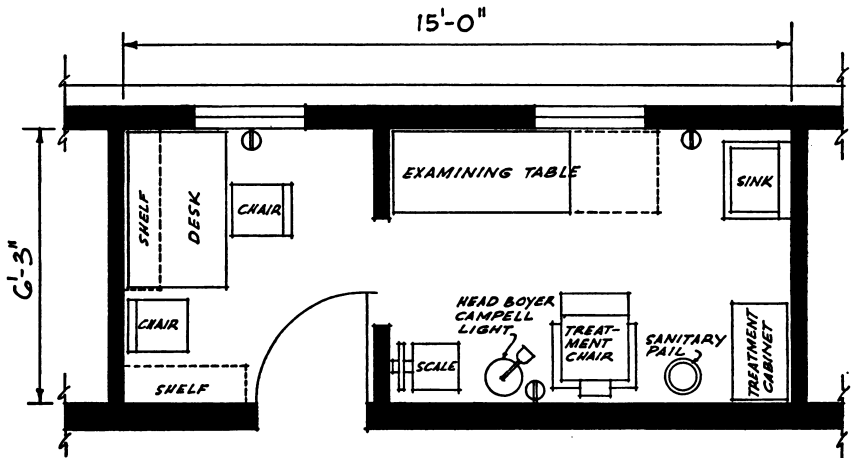
Source: Industrial Relations Counselors, Inc.: "Company Medical Programs." *Occupational Medicine*, 3:376 (June) 1947.

Examples of Floor Plans

First-aid rooms for a small plant.



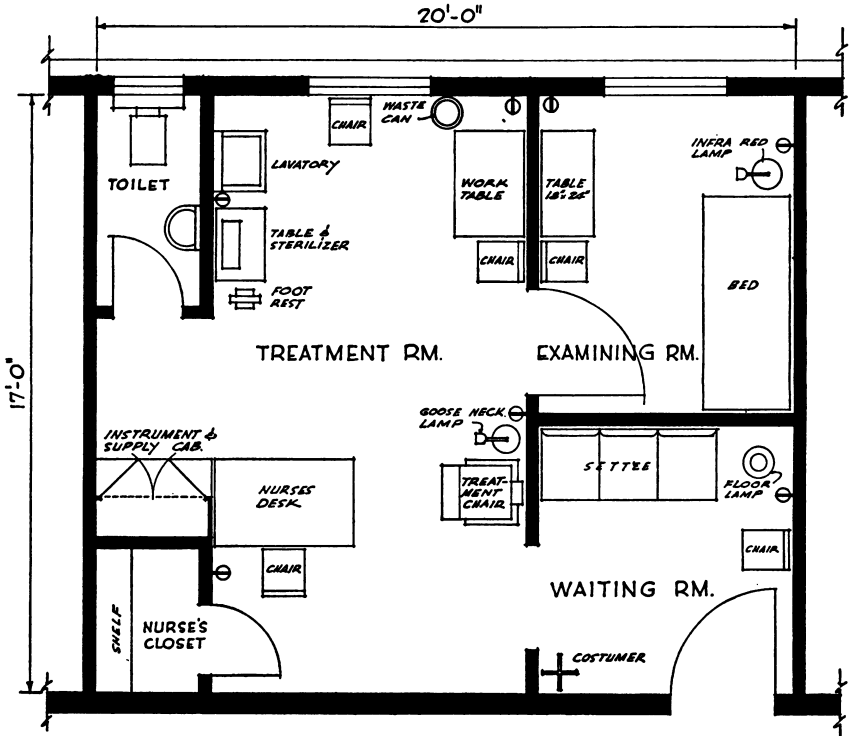
Source: Ritter, Wayne L., and Dugger, J. W.: "Industrial Health Units—Considerations and Designs for the Smaller Installations." *Industrial Medicine*, 12:661 (October) 1943.



Source: Millman, Nathan: "Medical Departments in Small Plants—Lay-out, Equipment, and Cost." *Industrial Medicine*, 18: 175 (April) 1947.

FIGURE 9.

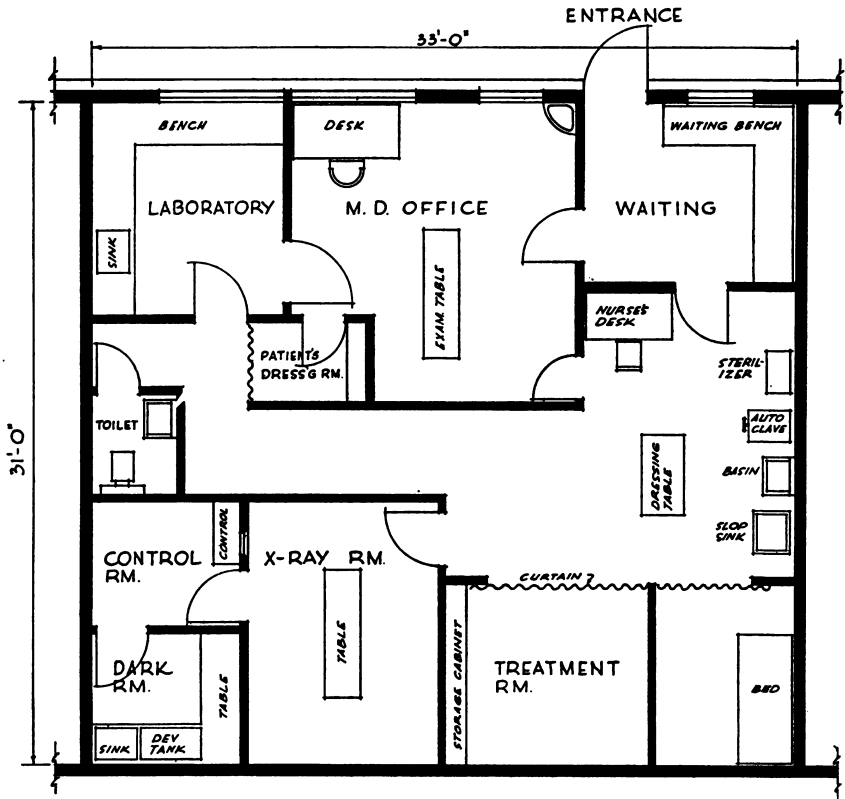
Dispensary for a small plant.



Source: American Mutual Liability Insurance Co.: Plan for an Industrial Medical Department. Boston, The Company, 1946, page 6.

FIGURE 10.

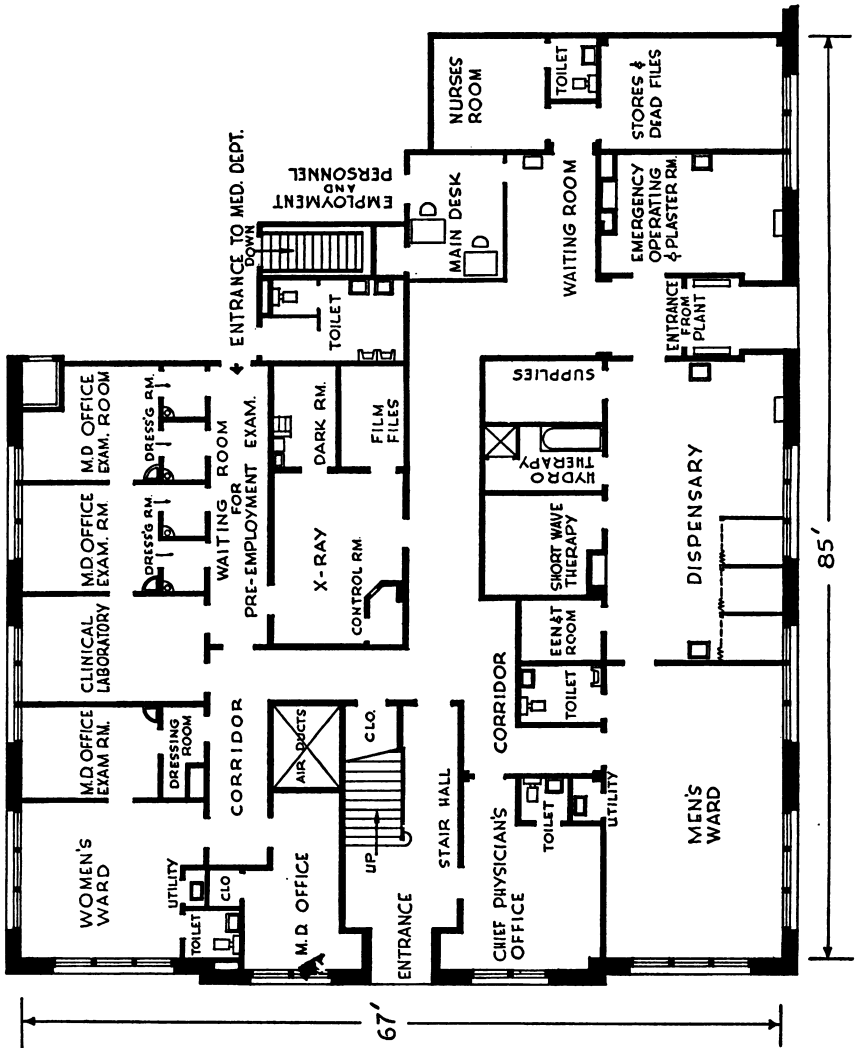
Medical department for a medium sized plant.



Source: Hess, Gaylord R.: Medical Service in Industry and Workmen's Compensation Laws. Chicago, American College of Surgeons, 1946, page 11.

FIGURE 11.

Medical department for a large plant.



Source: Hess, Gaylord R.: *Medical Services in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, page 12.

FIGURE 12.

Recommended Equipment

Recommended Equipment for the Physician

Bathroom scales (300-pound capacity).

Basal metabolism apparatus.

Manometer.

Combination ophthalmoscope and otoscope.

Electrocardiograph.

Percussor (reflex) hammers.

Telabinocular (Keystone) and Snellen's test cards.

Transillumination outfit.

Typewriter, portable.

Scissors, bandage, chrome plated.

Spirometer.

Sphygmomanometers.

Thermometers, hospital, (1 minute).

Stethoscopes.

Measuring tapes, steel, 5-foot.

Wood tongue depressors.

Tongue depressor jars.

Wood applicators.

Absorbent cotton.

Adhesive plaster, 2 inches by ten yards.

Notebooks.

Stationery.

Case record forms.

Flashlights.

Screens, 3-panel bedside.

Sheets.

Capes.

Towels, huck.

Laboratory coats.

Packing cases.

Microscope:

A. Monocular, equipped 4–16–1.9 mm. objective ocular 7.5x and 10.0x, mechanical stage.

B. If much work is done a binocular microscope with a separate monocular tube and the same equipment is recommended.

Substage microscope lamp, small box type with ground glass and daylight disk.

Such a lamp may also be obtained with a small ground glass bulls-eye condenser in place of the ground glass.

Blood-counting chamber (hemacytometer). Single or double Neubauer ruling recommended.

Blood diluting pipettes for RBC and WBC. At least six of each. One blood lancet, spring or spear.

Hemoglobinometer, with or without electric battery in handle.

Centrifuge, small electric, to carry four 15-cc. cups. The centrifuge should be small and portable.

Blood chemistry electrocolorimeter.
 Electric hot plate, small size, 6-inch.
 Alcohol lamp.
 Bunsen burner.
 Metal tripod.
 Six wire gauzes, with asbestos center.
 Slide forceps.
 Three test tube holders (metal forceps type).
 Test tube rack.
 Platinum loop.
 Six beaker brushes.
 Twelve test tube brushes.
 Extension cord and connections.
 Blood sedimentation outfit.
 File for cutting glass tubing.
 Hypodermic syringes and needles, 5-cc., 10-cc.
 Six rubber tapes, electrician's, for sealing bottles.
 Porcelain spot plate.
 Iron ring stand and rings.
 Filter stand.
 Urinometer.
 Twelve microscope slide boxes.

GLASSWARE

Twelve centrifuge tubes, 15-cc. graduated and plain.	Blood sugar tubes.
Test tubes, assorted.	Nonprotein nitrogen tubes.
Graduated cylinders.	Twelve staining jars, Coplin type.
Volumetric flasks.	Porcelain dishes.
Beakers.	Watch glasses.
Pipettes.	Two burettes.
Microscope slides and cover glasses.	Glass tubing.
	Rubber tubing.

The quantity and size of the various items of glassware should be determined by the extent of the proposed program.

STAINS

Methylene blue.	Gentian violet.
Basic fuchsin.	Saffranin.
Wright's blood stain.	Ziehl-Nielsen.
Toluidin blue.	Manson's.
Hematoxylin.	

The above stains should be purchased in powder form. Those mentioned will be found sufficient for almost all clinical laboratory staining methods.

Quoted from U. S. Public Health Service, Industrial Hygiene Division; Florida State Board of Health; and Florida Industrial Commission: *The Industrial Hygiene Problem in Florida*. Tallahassee, Florida Industrial Commission, 1946, pages 59-61.

Recommended Equipment for Small Plant Dispensary

A. General furnishings:

Sink.
Instrument cabinet.
Sterilizer.
Dressing table.
Leg rest.
Cot.
Stretcher.
Mirror, 10 by 12 inches.

Foot pedal waste can.
Waste basket.
First-aid kits.
Storage cabinets.
Paper towel rack.
Adhesive rack.
Record file.
Scale.

B. Instruments and supplies:

Scapels.
Splinter forceps.
Tissue forceps.
Hemostatic forceps.
Bandage scissors.
Iris scissors.
Surgical scissors.
Loupe.
Head mirror.
Hand magnifying glass.
Syringes.
Assorted hypodermic needles.
Assorted surgeon's needles.
Needle holder.

Assorted bandages.
Adhesive plaster.
Cotton.
Assorted gauze dressings.
Assorted sutures.
Assorted splints.
Assorted catheters.
Assorted jars and basins.
Test tubes.
Safety razor and blades.
Hot-water bottle.
Ice cap.
Crutches.
Tourniquet.

C. Physical examination equipment:

Stethoscope.
Blood-pressure apparatus.
Thermometer.
Otoscope.
Ophthalmoscope.
Nose and ear speculums.
Laryngeal mirror.
Spotlight.
Tongue depressors.
Snellen vision chart.

Hemoglobinometer.
Wassermann tubes.
Microscope.
Simple urine testing outfit.
Centrifuge.
Dynamometer.
Tuning fork.
Reflex hammer.
Flesh pencil.
Rubber gloves and finger cots.

Quoted from American Medical Association, Council on Industrial Health: "Medical Service in Industry: Industrial Medical Department." *Journal of the American Medical Association*, 117: 34-35 (July 5) 1941.

Records

Aims of Industrial Medical Records

Action, particularly in a long-range program, cannot be orderly and productive without accurate knowledge of what has been done and what needs to be done, and the record must furnish this information. To be satisfactory, it should serve unobtrusively, without infringing unduly upon the worker's time either in keeping it up to date or in using it for guidance. A record which appeals to the worker as both sensible and valuable will be found less of a burden to maintain and consult.

A scanty record fails to supply all the desired information; a too detailed record fails to high-light the important elements. The ideal record gives a lot for a little. It should be developed with due thought to its content, cost, and convenience. The content should reveal the facts necessary for action. The cost, not only in money but in time, should be commensurate with its purpose. In convenience, it should not be beyond the power of the staff to maintain and should be serviceable for use and consultation.

Quoted from King, Frances, and Feldman, Louis L.: *Office Management for Health Workers*. New York, The Commonwealth Fund, 1949, page 35.

Of all the tools used by industry, the human tools are the most important. They cannot be standardized, maintained, or improved by any totalitarian panaceas. There is but one way to deal with them and that is to recognize each one as a unit of physical and spiritual personality. The first duty of medicine is to the individual. Regardless of the great numbers involved, industrial medical departments should never lose sight of this ideal. Holding to it will best serve industry and the Nation. Therefore, in recording their experiences, industrial medical departments should make the **INDIVIDUAL** their **FIRST AIM**. Of necessity, such records must be of a simplicity capable of accumulating the maximum information concerning each individual with the least cost of time, effort, and space. They should be records of a high degree of efficiency in their practical application; readily accessible records that, day by day, can be consistently applied toward bettering and studying the safety, health, and environment of each and every individual; records to use—not simply to file.

We must never lose sight of the values, rights, and dignities of the obscurest individual. However, the better to understand man, we must look beyond the individual man, and his individual actions and interests, and view him in combination with his fellows and his work.

This brings up the SECOND AIM of our recording; namely, to organize and arrange our individual records in such manner that all possible statistical comparisons may be made—comparisons by occupation, age, population, and numerous other groups. Intrafactory group comparisons are quite capable of uncovering and controlling accident and occupational epidemics at present unsuspected. Keeping data available as a source of such research will greatly increase knowledge of what may be termed “collective pathology.” . . .

While not the immediate concern of an industrial physician or an industrial executive, our records should be capable of all forms of national statistical comparison—this, if for no other reason, being an obligation of good scientific citizenship. There is great need for such data and, if forthcoming, the science of industrial and national health will be immeasurably advanced.

Our THIRD AIM and, we believe, a very important one, is to translate our observations and records into a language common to and understood by industry. By nature of their very calling, industrial executives are extremely practical fellows. The languages of the physician and the vital statistician are foreign to them, and they show little inclination to master those vocabularies. What the average industrial manager wants to know is that which goes on in relation to the safety and health of his own employees, in his own plant, and it is part of our job to shape our records and interpret our opinions to fulfill that requirement. We should adapt our language to that of industry and not expect (as is so often the case) industry to adapt its understanding to that of the profession.

The FOURTH AIM is to create some form of yardstick or measuring rod as a basis for evaluating the effectiveness of safety and health administration. The opportunity afforded us in having a large group of people under constant observation suggests the creation of another basis of measure, namely, a measure that will indicate the “collective” trends in health and safety. Widespread use of this latter form of measure by industry is a potential for vast future contributions to the science of national public health and safety. Let us emphasize this important point—that *any basis of measure be simple and easily understood by management.*

Quoted from Fulton, William J.: “Records—The Seeing Eye of Industrial Medicine.” *Industrial Medicine*, 13: 1-2 (January) 1944.

Suggested Record and Report Forms

Samples of records and report forms should serve as a brief guide for plants in setting up or revising their record systems. The needs of different plants vary but any basic records can be adapted to meet the requirements of the average industry. All records pertaining to an employee's physical condition are of a strictly confidential nature and should be kept in the medical department and preferably in a locked file.

I. ADMINISTRATIVE RECORDS

- A. Daily reports.
- B. Monthly reports.
- C. Annual reports:
 - 1. Statistical reports.
 - 2. Narrative reports.

II. INDIVIDUAL RECORDS

- A. Employee's health history and occupational history.
- B. Physical examination forms:
 - 1. Preplacement, periodic, and special examinations. There is much variation here—at best, a certain basic physical examination procedure can be recommended for any type of industry. Specialized procedures and detailed examinations of specific regions will vary with the demands of different industries.
 - 2. Special examination procedures, such as vision, audiometric tests, mass chest X-ray screening programs, venereal disease diagnostic measures, dental hygiene, and any other specialized procedure forms.
 - 3. Report forms to management—for recording information and for making recommendations based on the results of any examination procedure methods of evaluating disability or deformity and recommendations for placement in special jobs according to their restrictions.
- C. Personal health and accident record:

This is designed to be a cumulative record of all services given to each worker in the medical department in regard to his health, safety, or welfare. When treatment or advice is given by the doctor, nurse, or first-aid worker, a notation of the visit should be entered on this form. All conditions, no matter how slight or inconsequential they may seem, should be noted.

III. MISCELLANEOUS RECORDS

- A. Referral for medical or nursing attention.
- B. Medical or nursing recommendations.
- C. Foreman's injury report.
- D. Absentee records:
 - 1. Absentee record keeping system.
 - 2. Monthly summary of absentees.

IV. PLANT HYGIENE RECORDS AND REPORTS

(This is to facilitate the work of industrial hygiene personnel only)

- A. Forms for recording workroom data, hazards, and recording of results of studies.
- B. Records of activities to be used by industrial hygiene field personnel—physicians, nurses, engineers, and chemists.
- C. Laboratory analysis records.
- D. Reports of findings to management, etc.

Quoted from American Conference of Governmental Industrial Hygienists:

"Report of the Committee on Standardization and Plant Records and Reports." Transactions of the Eleventh Annual Meeting. Washington, The Conference, 1949, pages 60-61.

Establishments by Type of Records and Use of Data

Table 104.—Percent of surveyed establishments maintaining specified types of records and providing health information to employees, by size of establishment ¹

Size class (number of employees)	Number of establishments surveyed	Percent of establishments—					
		Maintaining individual health records, under medical control	Making regular reports on health activities to responsible person or agency	Providing information to employees regarding—			
				Physical examinations		Industrial hygiene	
				Rou- tinely	On re- quest	Rou- tinely	On re- quest
All establishments.	278	34.8	55.7	31.3	19.4	5.7	21.9
Under 500.....	43	16.3	53.5	16.3	34.8	0	13.9
500 to 999.....	49	18.7	27.9	18.7	12.5	0	20.0
1,000 to 1,499.....	50	28.0	54.0	34.0	20.0	16.6	26.0
1,500 to 1,999.....	17	29.4	53.8	35.3	23.5	0	23.5
2,000 to 3,999.....	42	35.7	52.4	30.9	14.3	0	16.7
4,000 to 9,999.....	43	39.6	53.0	39.6	13.9	0	30.3
10,000 and over.....	34	88.2	91.3	53.0	20.6	38.2	23.5

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about a fourth of whom were women. About 5 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 40.

Costs and Values

Factors Influencing Costs

I. TYPE OF SERVICE (KIND, SCOPE, AND EXTENT)

A. Basic needs of plant:

1. Average number of total employees—1 out of every 15 workers per shift will visit medical department regardless of type of industry.
2. Age and sex distribution of employees—as a rule, 85 percent of the dispensary visits come from 30 percent of the workers and age and sex seem to have a definite bearing on this.
3. Type of industry—certain potential hazardous exposures of the type of industry in which a plant is classified will serve as an index to:
 - a. Expected number of total cases to be treated in plant medical department;
 - b. Estimated accident and illness frequency and severity rate for the industry based on national experience and the plant's experience on a retrospective basis;
 - c. Estimated labor turn-over based on national experience and plant experience. If there is an excessive labor turn-over, there will be needed an increased number of preplacement and termination physical examinations;
 - d. Indicated type of medical-vigilance program. In a plant classified as a hazardous industry there will be needed more frequent and more extensive periodic examinations to detect and control occupational diseases;
 - e. Expected absenteeism. The national experience and plant experience of the type of industry will indicate the number of "return-to-work" type of periodic physical examinations;
 - f. Alloted space, facilities, and equipment. As far as is known, there is no specific formula for determining the amount of floor space or the number of rooms or amount of equipment which should be used in the plant medical department. . . .

B. Conceptions of personnel of plant organization:

1. Predominant activities or hazards:
 - a. The medical and production personnel in a plant

where inspectional or precision type of work predominates may plan an extensive "eye-care program" utilizing mass eye-testing devices and several of the "eye-cure professions."

b. The medical, safety, and production personnel in a plant with potentially hazardous exposures to dust, fumes, vapors, etc., may plan an extensive medical-vigilance program in its industrial hygiene program with increased laboratory, toxicological, and atmospheric examinations.

2. Techniques of accounting department:

The accounting personnel in various plants differ as to what constitutes the cost of the medical department. Some plants report the original investment or capital cost as solely that of furniture, equipment, and fixtures, whereas others include in addition the cost of building or other types of capital outlay. Other companies separate safety activities from medical activities.

II. PREVAILING MARKET (SALARIES, EQUIPMENT, SUPPLIES)

III. ADMINISTRATIVE METHODS

A. *Method of purchase:*

If the medical department's equipment and supplies are purchased through a centralized purchasing department instead of directly through the medical department, this, particularly in the large plants, may influence the costs.

[B. *Insurance Premiums*]:

1. Industry's share of premium of group-insurance coverage.
2. Premium of compensation insurance.
3. Premium of malpractice insurance.

C. *Union contract clauses as to time spent in medical department:*

Some plants have established a policy of charging the first 15 minutes of a worker's time spent in the plant medical department to the plant production department and, thereafter, it is charged to the medical department.

At present, there is so much difference as to how the reported figures of cost are arrived at that comparisons are difficult and the average cost cited in most of the presently completed surveys mean very little. . . .

Quoted from State of New Jersey Department of Health, Division of Industrial Health: "Medical Program Overhead," *Industrial Health Bulletin*, 3: 2-6 (circa 1949).

Per Capita Costs

To establish, equip, staff, operate, and maintain an industrial medical department requires a substantial investment in order to provide specific services which can be of definite benefit to both employer and

employee. The costs of such a department depend upon a number of factors, mainly the size, hazards, and health needs of the manufacturing establishment and the comprehensiveness of the program. . . .

Industry has certain legal requirements to protect the health and safety of its workers. Beyond that point, the measures used for a more complete health and safety program depend upon management's concept of the value of the human machine in relation to better production and better business. The variations we find in management's attitude is reflected in the administration of the medical department. We are familiar with the functions of a good medical department, but we are not too clear as to the costs of part or all of these services in relation to the size and problems of a given industry.

In order to evaluate the organization, functions, and costs of such departments, it was necessary to analyze the experience of a number of different industries. An analysis of costs is not a simple task—the information is not always easy to obtain. . . .

Most of the plants found it difficult to uncover all of the expenditures which directly or indirectly resulted from the operation of the medical department. It is hard to understand how a business, otherwise most proficient in accounting for expenses to run every other department, has not followed the same practice for the medical department. To be sure, all these costs had been charged against plant operations, but they were buried in the expenses of other departments. The larger organizations offered more difficulties than the smaller ones. It was possible, however, to assemble the information from all of the plants and develop some basis for making a cost analysis.

It should be pointed out here that, in using the term "plant medical department," we refer to a separately housed and equipped dispensary or hospital unit under the administration of professional personnel with or without the direct supervision of a physician hired on a part- or full-time basis. . . .

The medical department costs and services in 40 plants were analyzed. This is a small number and perhaps not as significant statistically as a more extensive coverage. Nevertheless, this number represents a good cross section of industry—all sizes, varied in hazards and products manufactured, and representing every phase of medical department administration.

Size distribution and per capita costs were as follows:

Number of employees	Number of plants	Average per capita cost
100 to 499.....	13	\$15.67
500 to 999.....	12	21.28
1,000 to 1,999.....	7	12.36
2,000 to 4,999.....	6	10.15
5,000 and over.....	2	6.00

This table illustrates how the health needs and problems of an industry can greatly influence the costs. The smallest industry in this entire series housed only 150 men and women. It was an industry operated exclusively for the rehabilitation of handicapped persons. The medical staff and services included a full-time graduate registered nurse, visiting nurse service, a part-time medical director, numerous consultants, dental services, extensive equipment for a rehabilitation program, technicians, artificial appliances, a very good visual correction and protection program, and a rigid safety program. These persons are taught trades of all kinds; they are subjected to a wide variety of hazards. For these reasons, the most complete protective measures must be taken. This small plant has a per capita cost of \$33—unusual but most essential for this group of individuals.

The progressive drop in the per capita cost from the 500 to 999 group through the 5,000 and over group is significant and in keeping with similar studies by others. It indicates that the larger plants with a greater staff and with more emphasis on good administration will tend to have lower costs.

Cost analysis by type of manufactured products:

Industry	Percent of total	Average per capita cost
Paper and its products.....	18.0	9.66
Food and beverages.....	15.0	11.54
Iron and steel (heavy) ¹	30.5	14.41
Miscellaneous machining operations.....	36.5	9.81

¹ Foundry sections in each plant of this group.

The industries in these classifications represent working hazards and potentially harmful exposures of almost every known kind. The hazardous nature of the processes in the heavy iron and steel group caused a more costly disability experience and required a more extensive preventive program than the other groups. The food and beverage industries were found to have good medical programs—excellent sanitation and emphasis of the health of the employees was of paramount importance.

The type of supervision of the medical department was distributed as follows: 1 plant with a full-time medical director; 8 plants with part-time physicians in charge; and 31 plants with physicians on call only, with graduate registered nurses in charge of the department.

The costs of industrial medical departments can and should be accurately tabulated and analyzed. If we ever hope to present doubtful management with a dollars and cents argument on the value of a medical program, our best chance is by means of accurate cost records, analysis of those data and an intelligent interpretation of these findings.

Cost analyses should be determined by a uniform method to be of any value for the purpose of comparison. The most common and acceptable method is to arrive at the cost on a per capita basis. Some industries use the basis of costs per \$100 payroll. Per capita costs are determined by dividing the total of all expenditures per month or per year by the average total employment for that month or year.

There is a definite need to study this problem in greater detail in each industrial State. Attempt should be made to record all medical department costs, to analyze these costs by size and type of industry. An industrial medical department is as important as any other subdivision in the organization and should receive such recognition by top management.

Quoted from Brehm, Paul A.: "Cost Analysis of a Medical Department in Industry." *Industrial Hygiene Newsletter*, 9: 6-7 (January) 1949.

Table 105.—Per capita medical and compensation costs in 267 surveyed establishments, by type of benefit and size of establishment

Type of benefit	Size class (number of employees)			
	All establishments	1-499	500-999	1,000 and over
Number of establishments.....	267	24	32	211
Number of employees.....	971,604	6,657	23,483	941,464
	Per capita cost			
Total cost.....	\$14.16	\$18.96	\$17.07	\$13.91
Medical.....	9.85	13.35	12.33	9.76
Compensation.....	4.31	5.61	4.74	4.15
	Percentage distribution of cost			
Total cost.....	100	100	100	100
Medical.....	70	70	72	70
Compensation.....	30	30	28	30

Source: Hess, Gaylord R.: "Analysis of Experience of Industry in the Medical Care of Employees—A Compilation." *Bulletin, American College of Surgeons*, 33: 166 (September) 1948.

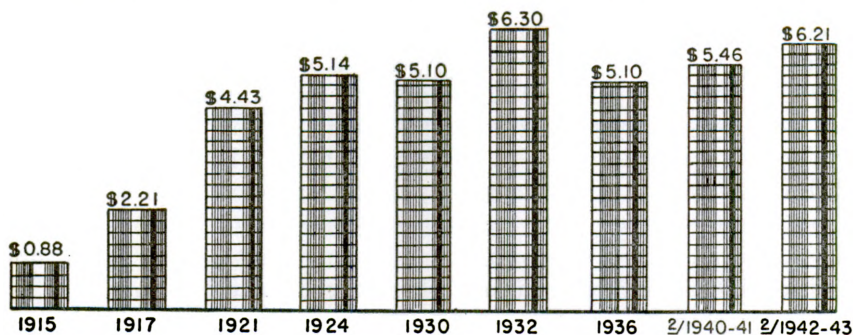
Table 106.—Distribution of 97 surveyed establishments by average annual per capita cost of medical services¹

Per capita cost	Establishments		Per capita cost	Establishments	
	Number	Percent		Number	Percent
Total.....	97	100.0	\$10 to \$15.....	23	23.7
Under \$1.....	5	5.2	\$15 to \$20.....	8	8.2
\$1 to \$5.....	13	13.4	\$20 to \$25.....	4	4.1
\$5 to \$10.....	39	40.2	\$25 and over.....	5	5.2

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: *Company Medical and Health Programs (Studies in Personnel Policy No. 96)*. New York, National Industrial Conference Board, Inc., 1948, p. 69.

Annual per capita medical cost in industry, 1915-43¹



Interest in caring for the human machine in industry is growing

¹ Data for 1915, 1917, M. W. Alexander; 1921, 1924, 1930, National Conference Board; 1932 to 1943 inclusive, American College of Surgeons. In a study of medical and compensation costs made by the American College of Surgeons, covering reports from 1932 to 1944, 582 industrial organizations representing 1,708,493 workers reported a medical cost of \$5.55 as compared with a previously reported cost of \$6.30 per employee in 1932. The per capita compensation cost in this study was \$4 per employee. The greater per capita cost in 1932 is partially explained by the fact that medical service, although reduced, was not curtailed as rapidly or as much as was employment during the depression period; consequently the medical costs were spread over comparatively fewer employees.

² In an analysis of medical costs made by the college during 1940 and 1941, 57 industrial establishments employing 140,000 workers reported a medical cost of \$5.46 and a compensation cost of \$1.96 per employee. In a more recent analysis, 72 companies employing 464,624 during 1942 and 1943 reported a medical cost of \$6.21 and a compensation cost of \$2.73 per employee. This tendency toward rising per capita costs is due to several factors. Since 1940 the use of full-time physicians in industry has increased 5 percent while the use of part-time physicians has increased 10 percent, and the employment of full-time registered nurses has increased 32 percent. There has been a marked increase in the remuneration received by these medical employees for their services and a substantial increase in the costs for hospitalization, medical supplies, administration of the department, and clerical services.

Source: Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, pages 56-58.

FIGURE 13.

Table 107.—Companies reporting cost data on specified types of industrial health programs and average annual per capita cost of programs, by major industrial classification¹

Industry	Medical program			Safety program			Industrial hygiene program		
	Number of companies	Average per capita cost	Ratio to average for all industries	Number of companies	Average per capita cost	Ratio to average for all industries	Number of companies	Average per capita cost	Ratio to average for all industries
Total, all industries...	688	\$5.17	1.00	494	\$3.34	1.00	159	\$3.41	1.00
Chemicals and their products.....	45	5.42	1.05	32	3.21	.96	7	5.33	1.56
Electrical products.....	23	4.95	.96	18	1.84	.55	9	1.98	.58
Food and kindred products.....	124	2.97	.57	38	2.54	.76	23	1.62	.48
Iron and steel, heavy.....	65	4.51	.87	55	4.69	1.40	13	6.15	1.80
Leather and its products.....	4	4.80	.93	4	4.57	1.37	—	—	—
Lumber and its products.....	19	10.29	1.99	19	3.42	1.02	4	2.09	.61
Machinery and machine tools.....	98	5.35	1.03	79	2.84	.85	29	3.88	1.14

See footnote at end of table.

Table 107.—Companies reporting cost data on specified types of industrial health programs and average annual per capita cost of programs, by major industrial classification¹—Continued

Industry	Medical program			Safety program			Industrial hygiene program		
	Number of companies	Average per capita cost	Ratio to average for all industries	Number of companies	Average per capita cost	Ratio to average for all industries	Number of companies	Average per capita cost	Ratio to average for all industries
Metal products, miscellaneous.....	126	\$6.38	1.23	105	\$2.84	0.85	17	\$2.92	0.86
Mining and quarrying.....	6	12.26	2.37	7	5.27	1.58	3	5.59	1.58
Paper and its products.....	37	6.05	1.17	33	3.73	1.12	3	3.55	1.04
Petroleum refining.....	15	6.58	1.27	15	7.87	2.36	2	5.00	1.47
Printing and publishing.....	8	2.33	.45	6	1.45	.44	2	.85	.54
Public utilities.....	5	4.53	.83	4	2.55	.77	—	—	—
Rubber and its products.....	28	5.51	1.07	13	1.40	.42	10	1.30	.38
Shipbuilding and other construction.....	4	3.08	.60	5	11.83	3.54	2	6.34	1.86
Stone, clay, and glass products.....	33	4.94	.96	34	3.72	1.11	16	1.90	.56
Textiles and their products.....	40	4.60	.89	22	1.64	.49	12	6.77	1.99
Unclassified.....	8	4.02	.78	5	3.13	.94	2	2.96	.87

¹ Data compiled as part of a 1940 survey of 1,500 companies covering 2,064 establishments in 47 States. Information is based on replies from companies reporting separate cost items for specified types of program. Some companies reported combined cost figures for 2 or more programs, but these figures have been excluded.

Source: National Association of Manufacturers: Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, p. 74.

Table 108.—Companies reporting cost data on specified industrial health programs, and average annual per capita cost of programs, by size class and method of reporting, 1940¹

Size class (number of employees)	Number of companies surveyed	Companies reporting					
		Total		For 2 or more establishments		For 1 establishment	
		Number	Per capita cost	Number	Per capita cost	Number	Per capita cost
Medical program							
All companies.....	2,064	687	\$5.17	341	\$5.06	346	\$5.26
1-249.....	821	290	4.37	191	4.02	99	5.06
250-499.....	467	149	6.12	57	6.80	92	5.70
500-749.....	210	58	6.22	19	7.13	39	5.93
750-999.....	148	50	5.58	14	5.02	36	5.80
1,000-1,999.....	236	78	5.46	32	6.84	46	4.50
2,000-4,999.....	118	46	4.71	20	4.87	26	4.59
5,000-9,999.....	28	8	4.90	5	6.03	3	3.02
10,000-19,999.....	26	7	4.66	3	6.25	4	3.47
20,000 and over.....	10	1	7.00	—	—	1	7.00
Safety program							
All companies.....	2,064	495	\$3.34	237	\$2.97	258	\$3.67
1-249.....	821	197	3.76	114	3.36	83	4.30
250-499.....	467	120	2.70	49	2.65	71	2.74
500-749.....	210	48	3.34	17	2.81	31	3.63
750-999.....	148	31	3.51	11	2.83	20	3.71
1,000-1,999.....	236	57	3.45	27	2.78	30	4.06
2,000-4,999.....	118	30	2.97	11	1.93	19	3.57
5,000-9,999.....	28	7	2.63	5	2.23	2	3.63
10,000-19,999.....	26	4	2.75	3	1.33	1	7.00
20,000 and over.....	10	1	4.00	—	—	1	4.00

See footnote at end of table.

Table 108.—Companies reporting cost data on specified industrial health programs, and average annual per capita cost of programs, by size class and method of reporting, 1940¹—Continued

Size class (number of employees)	Number of com- panies surveyed	Companies reporting					
		Total		For 2 or more es- tablishments		For 1 establishment	
		Number	Per ca- pita cost	Number	Per ca- pita cost	Number	Per ca- pita cost
Industrial hygiene program							
All companies.....	2,064	159	\$3.41	64	\$2.55	95	\$3.99
1-249.....	821	57	2.68	25	1.65	32	3.49
250-499.....	467	39	4.04	12	4.19	27	3.98
500-749.....	210	17	5.32	6	5.97	11	4.96
750-999.....	143	14	1.87	4	1.13	10	2.17
1,000-1,999.....	236	17	4.07	12	1.76	5	9.63
2,000-4,999.....	118	10	2.93	4	2.51	6	3.22
5,000-9,999.....	28	1	3.20	-----	-----	1	3.20
10,000-19,999.....	26	3	3.51	1	.10	2	5.21
20,000 and over.....	10	1	3.00	-----	-----	1	3.00

¹ Based on a 1940 survey of 1,500 companies (2,064 plants) in 47 States. With 2 exceptions, not more than 10 percent of the plants were located in any 1 State (New York, 11.3; Pennsylvania, 10.6). About 2 million workers were covered, 5 percent were employed by plants with less than 250 employees and 40 percent by plants with 5,000 or more. More than 17 major industrial groups were represented by the surveyed industries. Less than 10 percent of the plants were in any 1 group except the following: Food and miscellaneous products, 12 percent; machinery and machine tools, 14 percent; metal products, miscellaneous, 16 percent.

Source: National Association of Manufacturers: Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, p. 76.

Table 109.—Average annual per capita cost of industrial health programs to companies reporting on the cost of separate and combined programs by type of program¹

Type of program	Number of companies	Average per capita cost
Separate programs		
Medical.....	688	\$5.17
Safety.....	494	3.34
Industrial hygiene.....	159	3.41
Combined programs		
Medical and safety.....	21	5.97
Medical and industrial hygiene.....	57	4.90
Safety and industrial hygiene.....	12	5.51
Medical, safety, and industrial hygiene.....	142	8.81

¹ Based on a 1940 survey of 1,500 companies (2,064 plants) in 47 States. With 2 exceptions, not more than 10 percent of the plants were located in any 1 State (New York, 11.3; Pennsylvania, 10.6). About 2 million workers were covered, 5 percent were employed by plants with less than 250 employees and 40 percent by plants with 5,000 or more. More than 17 major industrial groups were represented by the surveyed industries. Less than 10 percent of the plants were in any 1 group except the following: Food and miscellaneous products, 12 percent; machinery and machine tools, 14 percent; metal products, miscellaneous, 16 percent.

Source: National Association of Manufacturers: Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, p. 43.

Table 110.—Annual per capita cost and number and type of personnel employed for industrial health programs of 111 establishments in 1945, by type of industry ¹

Type of industry and company code	Number of employees	Average annual per capita cost	Number and type of personnel employed				
			Physicians			Nurses	Others ²
			Director	Full time	Part time		
Chemicals, drugs, and soap products:							
Company A.....	4,350	\$15.16	1	4	-----	13	3
Company B.....	3,542	24.00	1	2	-----	12	6
Company C.....	975	17.03	1	1	-----	1	1
Company D.....	5,244	10.00	-----	-----	-----	-----	-----
Unit 1.....	609	15.16	-----	1	-----	1	-----
Unit 2.....	1,920	6.24	-----	1	-----	2	-----
Unit 3.....	1,206	9.60	-----	1	-----	1	-----
Unit 4.....	507	11.53	-----	-----	1	1	-----
Unit 5.....	486	9.91	-----	-----	1	1	-----
Unit 6.....	279	15.59	-----	-----	1	1	-----
Unit 7.....	237	19.62	-----	-----	1	1	-----
Electrical products:							
Company E.....	29,000	5.83	-----	-----	-----	-----	-----
Unit 1.....	1,500	10.00	-----	-----	1	2	2
Unit 2.....	13,000	2.23	-----	1	8	6	1
Unit 3.....	4,500	8.89	-----	-----	1	4	5
Unit 4.....	4,300	8.37	-----	-----	1	7	1
Unit 5.....	2,000	5.50	-----	-----	1	3	-----
Unit 6.....	1,700	11.18	-----	-----	2	1	1
Unit 7.....	2,000	9.50	-----	-----	1	4	-----
Company F.....	73,620	14.62	-----	-----	-----	-----	-----
Unit 1.....	27,353	13.86	1	4	29	47	36
Unit 2.....	32,840	12.60	1	6	18	46	25
Unit 3.....	7,623	19.86	-----	1	8	22	22
Unit 4.....	5,804	22.83	-----	-----	4	15	2
Food and allied products:							
Company G.....	5,500	6.04	-----	-----	-----	-----	-----
Unit 1.....	1,200	3.83	-----	-----	1	1	-----
Unit 2.....	600	8.50	-----	-----	1	1	-----
Unit 3.....	1,300	11.54	-----	-----	1	1	-----
Unit 4.....	1,200	3.33	-----	-----	1	-----	1
Unit 5.....	1,200	3.75	-----	-----	1	1	1
Company H.....	17,002	9.25	-----	-----	-----	-----	-----
Unit 1.....	687	21.11	-----	-----	1	1	-----
Unit 2.....	5,147	7.29	-----	2	-----	3	-----
Unit 3.....	1,542	7.78	-----	2	-----	2	-----
Unit 4.....	4,378	7.42	-----	1	-----	2	-----
Unit 5.....	6,248	11.57	-----	3	-----	6	-----
Company I.....	5,402	1.43	-----	-----	-----	-----	-----
Unit 1.....	1,842	2.39	-----	-----	1	4	3
Unit 2.....	936	.84	-----	-----	1	4	1
Unit 3.....	282	4.62	-----	-----	1	4	1
Unit 4.....	1,490	1.12	-----	-----	1	-----	-----
Unit 5.....	589	1.11	-----	-----	1	4	1
Unit 6.....	263	1.52	-----	-----	1	-----	-----
Company J.....	1,180	13.86	-----	-----	1	2	1
Company K.....	1,200	12.92	(³)	-----	6	3	-----
Company L.....	3,877	5.26	-----	-----	-----	-----	-----
Unit 1.....	936	8.17	-----	-----	1	2	-----
Unit 2.....	1,350	2.91	-----	-----	1	2	-----
Unit 3.....	789	4.96	-----	-----	1	1	-----
Unit 4.....	428	5.01	-----	-----	-----	-----	-----
Unit 5.....	200	2.59	-----	-----	-----	-----	-----
Unit 6.....	174	12.95	-----	-----	1	1	-----
Machinery:							
Company M.....	3,500	5.01	-----	-----	2	5	-----
Company N.....	11,990	20.35	-----	-----	-----	-----	-----
Unit 1.....	3,450	17.68	1	1	-----	6	2
Unit 2.....	5,540	27.62	-----	2	-----	6	3
Unit 3.....	3,000	10.00	-----	1	1	6	1

See footnotes at end of table.

Table 110.—Annual per capita cost and number and type of personnel employed for industrial health programs of 111 establishments in 1945, by type of industry¹—Continued

Type of industry and company code	Number of employees	Average annual per capita cost	Number and type of personnel employed				
			Physicians			Nurses	Others ²
			Director	Full time	Part time		
Metal products:							
Company O.....	10,357	\$14.25					
Unit 1.....	1,125	4.99			1	1	
Unit 2.....	1,702	20.58			1	4	
Unit 3.....	166	2.90			1		
Unit 4.....	348	14.65			1	1	
Unit 5.....	372	15.73			1	1	
Unit 6.....	2,002	17.55			1	3	
Unit 7.....	1,012	13.97			1	3	
Unit 8.....	229	17.25			1	1	
Unit 9.....	936	10.65			1	1	
Unit 10.....	658	16.69			1	1	
Unit 11.....	1,026	9.27			1	2	
Unit 12.....	781	15.18			1	2	
Company P.....	1,474	6.78			1	4	
Company Q.....	560	1.94			2	2	
Company R.....	2,688	11.16	1	2		5	
Company S.....	3,907	3.58			1	5	
Paper products:							
Company T.....	1,681	4.23					
Unit 1.....	155	.71					
Unit 2.....	1,526	4.59			1		
Company U.....	5,675	12.86					
Unit 1.....	3,000	17.20	1	3		8	5
Unit 2.....	900	7.44		1		1	
Unit 3.....	900	10.56		1		2	
Unit 4.....	875	5.94		1			
Public utilities:							
Company V.....	9,225	12.79					
Unit 1.....	8,000		1	3	2	3	2
Unit 2.....	308			1	1	1	
Unit 3.....	335				1	1	
Unit 4.....	320				1	1	
Unit 5.....	262				1	1	
Company W.....	2,000	7.50					
Unit 1.....	1,650				2	1	
Unit 2.....	350				1		
Publications:							
Company X.....	1,600	7.81			1	2	1
Company Y.....	1,144	5.91			1	1	
Textile products:							
Company Z.....	20,700	14.49					
Unit 1.....	500		2			1	2
Unit 2.....	2,600			1		6	2
Unit 3.....	3,900			1		6	2
Unit 4.....	2,300			1		6	2
Unit 5.....	3,500			1		6	2
Unit 6.....	3,400			1		6	2
Unit 7.....	1,300			1		6	2
Unit 8.....	3,200			1		6	2
Company AA.....	2,873	12.31	1	2		3	
Company BB.....	1,022	8.23			1	2	
Company CC.....	7,531	3.05					
Unit 1.....	4,036	2.97			3	1	
Unit 2.....	3,495	3.15			3	1	
Miscellaneous:							
Company DD.....	105,769	6.11					
Unit 1.....	5,900	11.75	1	1	6	3	7
Unit 2.....	7,844	7.20	1	1	2	3	4
Unit 3.....	22,647	3.92		3	7	4	15
Unit 4.....	41,346	6.83	1	1	30	17	35
Unit 5.....	14,850	4.87			5	3	7
Unit 6.....	13,182	5.81		1	5	11	4
Company EE.....	1,903	21.02					
Unit 1.....	997				8	6	
Unit 2.....	500				8	1	
Unit 3.....	406				1		

See footnotes at end of table.

Table 110.—Annual per capita cost and number and type of personnel employed for industrial health programs of 111 establishments in 1945, by type of industry ¹—Continued

Type of industry and company code	Number of employees	Average annual per capita cost	Number and type of personnel employed					
			Physicians			Nurses	Others ²	
			Director	Full time	Part time			
Miscellaneous—Continued								
Company FF.....	¹⁰ 23,000	\$5.43						
Unit 1.....	2,500		1	1	2	1	4	
Unit 2.....	4,000			1		3	1	
Unit 3.....	2,200			1		3	1	
Unit 4.....	2,000				1	2	1	
Unit 5.....	1,000			1		1		
Unit 6.....	2,000			1				
Company GG.....	22,761	4.91						
Unit 1.....	21,511		1	7	1	13	3	
Unit 2.....	1,250				1	4		
Company HH.....	14,300	9.14						
Unit 1.....	13,000	9.67	1	4		4	13	
Unit 2.....	1,300	3.85		3		2	1	

¹ Based on returns from a questionnaire sent to 52 companies by the Industrial Relations Counselors, Inc., in 1946. Cost figures for 1945 were furnished by 31 companies with 111 establishments and approximately 400,000 workers. The average annual cost per employee was \$9.42, ranging from a purely nominal figure of \$0.71 in 1 relatively small headquarters office to \$24 in the main factory of a drug company, which gives special emphasis to its medical program. In view of the wide range of costs reported and probable differences in accounting procedures, the average figure given should be regarded only as indicative of the general level of such costs.

² Principally technicians and clerks.

³ Includes 417 regular employees and 4,985 seasonal workers, distributed proportionately among plants.

⁴ Employed seasonally, 12 to 30 weeks.

⁵ Employee-paid medical plan.

⁶ Outside adviser.

⁷ Estimated for 1946.

⁸ 1 unit only.

⁹ On call.

¹⁰ Including subsidiaries.

Source: Industrial Relations Counselors, Inc.: "Company Medical Programs" Occupational Medicine, 3:574-579 (June) 1947.

Estimated Per Capita Cost Under a Cooperative Health Center Designed to Serve Several Small Businesses

Capital and operating costs will necessarily vary with locality and the scope of the program, but the [following] table will serve as a reasonable basis for estimating the expenditure necessary to operate the minimum program outlined above [see p. 127], almost anywhere in Georgia. The businessman will notice in this table the repetition of a common experience: The unit cost declines as volume increases. This fact points up the desirability of establishing a center which has the capacity to grow and to attract increased participation.

Annual cost estimate, to be prorated among industries on a per capita basis

1,000 employees:

Physician, half time.....	\$4,000
Nurses, 2.....	5,000
Clerks, 1.....	1,800
Supplies.....	1,200
Rent, heat, light.....	2,400
Total.....	14,400
Per capita.....	14.40

Annual cost estimate, to be prorated among industries on a per capita basis—Continued

2,000 employees:

Physician, full time.....	\$8, 000
Nurses, 4.....	10, 000
Clerks, 1.....	1, 800
Supplies.....	2, 400
Rent, heat, light.....	2, 400
Total.....	24, 600
Per capita.....	12. 30

5,000 employees:

Physician, 1 full time, 1 half time.....	12, 000
Nurses, 7.....	17, 500
Clerks, 2.....	3, 600
Supplies.....	6, 000
Rent, heat, light.....	4, 800
Total.....	43, 900
Per capita.....	8. 78

Cost of construction of building: 2,000 square feet for 2,000 employees at \$10 per square foot, \$20,000.

Property: Health center building, general furnishings, special diagnostic equipment, instruments and supplies, and first-aid rooms in industrial plants. A mobile clinic (truck-trailer) could be considered.

Quoted from Petrie, L. M., and Lemon, J. W.: "A Health Program for Industry." *Industrial Hygiene Newsletter*, 10: 5-6 (December) 1950.

Per Capita Dental Costs

How is the cost of dental service borne? . . . A large number of services, comprising almost the entire examination plus prophylaxis group, and some of the services offering treatment, are entirely paid for by the employer as his contribution toward the goodwill and efficiency of his working force. Next in frequency is a cooperative arrangement wherein the company furnishes space for a dental office and perhaps also a certain amount of major equipment. A local dentist then comes in, usually on a part-time basis, bringing with him his own instruments and supplies, and usually charging fees by the operation. These fees are usually lower than in an outside practice because the dentist's overhead is cared for, his practice is steadier, his bills are easier to collect and he can make a reasonable income at a reduced price. A variation of this basic plan permits the dentist to rent the office which the company has established upon the premises and conduct his practice exactly as he would elsewhere, though again usually for reduced fees. Another procedure, found chiefly among large corporations with well developed employee welfare policies, involves the use of a mutual benefit association. . . .

Other plans for the allocation of the cost of dental service involve the insurance method already spoken of, payroll deductions where the only company contribution is convenient budgeting of the dental bill, and finally a few other arrangements, usually slight variations of the cooperative plan for dividing cost between employer and employee. . . .

The expense to a company of establishing a dental clinic on its own premises is a very difficult one upon which to get figures. Such figures as were obtained from the American Dental Association study gave yearly expenditures by the company toward dental service of from \$0.64 to \$9.45 per patient treated. These figures vary so widely that attempts to analyze them would be futile. . . .

Quoted from Dunning, James M., Walls, R. M., and Lewis, Samuel R.: "Prevalence and Characteristics of Dental Service in Industry." *Journal of the American Dental Association*, 28: 498-499 (March) 1941.

The initial cost of installing a chair with a simple dental unit, consisting of engine and a minimum outfit of instruments, may be in the neighborhood of \$1,500 to \$2,000. If X-ray equipment is provided, approximately another \$1,000 will be added. Record forms will call for a slight additional outlay.

For a service which included examination, prophylaxis, consultation, and emergency work, the annual operating expenses for a plant employing 2,500 workers might be estimated at about \$6,000. As a general rule, the greater the number of employees cared for, the less is the per capita cost of such service.

Quoted from Metropolitan Life Insurance Co., Industrial Health Section: *Industrial Dental Service*. New York, The Company (undated), page 23.

Original Investment and Costs

Table 111.—Persons employed, original investment, monthly cost of health program, and number and type of medical and auxiliary personnel employed, in 9 reporting establishments¹

Number of persons employed	Original investment ²	Monthly cost				Number and type of personnel employed				
		Total	Other than salaries	Salaries		Physicians	Nurses	Auxiliary personnel	Clerks	Ambulance drivers
				Amount	Percent					
557.....	\$3,000	\$590	\$65	\$525	89	1	2			
853.....	1,200	550	300	250	45					
953.....	1,000	225	55	170	76		1			
2,329.....	16,000	1,150	300	850	74		2			
3,153.....	12,500	1,550	550	1,000	64	1	2		1	1
3,436.....	11,500	2,250	950	1,300	58	1	3		1	
7,621.....	12,500	1,750	650	1,100	63	1	4		1	1
10,671.....	13,500	3,300	1,100	2,200	67	1	9		3	1
14,347.....	15,000	3,800	1,000	2,800	74	1	9	1	3	2

¹ Data compiled during early part of a survey of 278 establishments in 33 States, made during 1945-47.

² Represents principally furniture, fixtures, and equipment and not buildings or other types of capital outlay.

³ Employed part time.

Source: Sappington, C. O.: *Industrial Health Department Functions and Relationships* (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 20.

Table 112.—Persons employed, original investment, monthly cost of health program, and number and type of medical and auxiliary personnel employed in 12 small establishments¹

Number of persons employed	Original investment ²	Monthly cost				Number and type of personnel				
		Total	Other than salary	Salary		Physicians		Nurses	Attendants	Other
				A-mount	Per-cent	Full time	Part time			
430.....	\$17,000	\$675	\$285	\$390	58		1	1	3	
357.....	656	439	100	339	75		1	1		
175.....	500	10	10				2		2	
426.....	7,600	427	108	319	75		1	1		
349.....	51,800	11,151	6,067	5,084	46	1		4		6
196.....	500	195	70	125	64		2		2	
143.....	1,500	160	20	140	84		2		1	
483.....	3,000	550	100	450	82		1	1		
345.....	4,000	700		700			1	4		
480.....	1,000	625	25	600	96		1	1	2	
323.....	450	400	100	300	75		1	2		2
415.....	2,250	675	50	625	93		1	2		1

¹ Data compiled as part of a survey of 278 establishments, made during 1945-47.

² For several of these establishments, the original investment included building costs.

³ On-call physicians.

⁴ 1 superintendent, 1 assistant director, 2 engineers, 1 dietician, 1 inspector.

⁵ 1 part-time sanitary inspector, 1 part-time dental assistant.

⁶ Includes 1 part-time visiting nurse; establishment also employs 1 part-time clerk.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 24.

Table 113.—Average original investment and average annual cost of health programs in surveyed establishments, by size of establishment¹

Size class (number of employees)	Number of establishments surveyed	Number of employees in establishments	Average original investment	Average annual cost per establishment		
				Maintenance	Salaries	Other
Under 500.....	43	15,945	\$7,444	\$2,186	\$10,271	\$20,260
500 to 999.....	49	47,399	5,097	4,946	9,365	715
1,000 to 1,499.....	50	89,541	7,372	3,763	12,561	1,624
1,500 to 1,999.....	17	38,082	47,296	21,456	24,986	4,707
2,000 to 3,999.....	42	93,014	19,149	35,093	28,148	9,000
4,000 to 9,999.....	43	231,157	36,529	28,720	47,066	12,549
10,000 and over.....	34	665,413	33,417	52,683	78,648	

¹ Based on a survey of 278 establishments in 33 States during 1945-47. The study included establishments engaged in the manufacture of diverse war and peace products and also various types of service plants. The total working population covered was 1.2 million, about a ¼ of whom were women. About 5 percent of the workers were in plants employing less than 1,000 persons and 76 percent were in plants with 5,000 or more employees.

Source: Sappington, C. O.: Industrial Health Department Functions and Relationships (Medical Series: Bull. No. VIII). Pittsburgh, Industrial Hygiene Foundation, 1948, p. 28.

Losses Due to Disability Among Workers

Disability among workers brings losses to the employer in several ways. In general his shop routine and organization may be disrupted or the productive efficiency of his labor force may be lowered. Absenteeism from work due to accident or illness may mean the absence from the production processes of key workers, resulting in the stoppage or slowing of production. . . . The quality of the labor force may also be impaired—resulting in a higher cost of production—since disability may impair the occupational and personal efficiency of the laborer.

Besides wage loss and medical care cost, the worker may suffer such monetary losses as extra outlays for diet and living facilities and interest charge on funds borrowed to tide over long periods of disability. . . . Indirect losses to the worker may be: decrease in occupational efficiency, risk of permanent disability, impairment of standard of living, declining personal health, and the effects of possible want and poverty.

Disability means losses to both consumers and the public. There may be less goods produced because of the accident and illness to workers, which will mean higher prices or fewer satisfactions in goods and services to the consumer. Many public and semipublic services may be interrupted by absence from their posts by disabled workers. There are also burdens upon the public arising from the existence in the population of persons unable to work—the consequent dependency will require public assistance through philanthropic contributions or taxes.

Quoted from Strow, Carl W.: *The Extent and Economic Cost of Disability* (Publication No. 23). Chicago, Research Council for Economic Security, 1947, pages 10-11.

The indirect or hidden costs to the employer studied by the Travelers Insurance Co. included such factors as cost of lost time of injured employee; cost of time lost by other employees who stopped work out of curiosity, out of sympathy, to assist the injured employee, or for other reasons; cost of time lost by foremen, supervisors, or other executives to assist injured employee, to investigate the cause of the accident, making arrangements for a substitute to take the place of the injured employee; selecting, training, or breaking in a new employee to replace the injured worker; preparing State accident reports, or attending hearings before industrial commissioners; cost of time spent on the case by first-aid attendant and hospital department staff when this time is not compensated by insurance; cost due to injury to the machine, tools, or other property, or to the spoilage of material; cost due to interference with production, failure to fill orders on time, loss of bonuses, payment of forfeits, and other similar causes; cost under employee welfare and benefit systems; cost in continuing the wages of the injured employee in full, after his return, even though the services of the employee who is not fully recovered may for a time be worth only about half of their normal value; cost due to the loss of profit on the injured employee's productivity and on idle machines; cost of subsequent injuries that occur in consequence of the excitement or weakened morale due to the original accident; overhead cost—the expense of light, heat, rent, and certain other items—which continues while the injured employee is a nonproducer.

Quoted from Brundage, Dean K.: "An Estimate of the Monetary Value to Industry of Plant Medical and Safety Services." *Public Health Reports*, 51: 1147 (Aug. 21) 1936. (Reprint No. 1765).

Table 114.—Employee losses from illness and nonindustrial injuries, and their indemnification through commercial insurance, 1948 ¹

Risk	Amount (in millions)		Percentage of total loss indemnified	Percentage of loss indemnified for the insured ³
	Loss	Benefit payments		
Total.....	\$18,652	\$448	2.4	13.1
Total medical.....	5,912	171	2.9	27.8
Hospital expense.....	1,200	109	9.1	34.9
Surgical expense.....	900	56	6.2	31.6
All other medical expenses.....	3,812	6	.2	4.7
Time loss ⁴	12,740	277	2.2	9.9
Weekly indemnity (temporary).....	3,940	180	4.6	10.0
Estimated disability.....	7,000	81	1.2	17.2
Accidental death and dismemberment.....	1,800	16	.9	3.1

¹ Based on data derived from Argus Casualty-Surety Chart, 1949, Including Accident, Health and Hospitalization; A. L. Kirkpatrick, "The Extent of Voluntary Health Protection," American Economic Security, July-August 1949; Group Insurance and Group Annuity Coverage, Continental United States Business 1947 and 1948, Life Insurance Association of America; Spectator Pocket Register of Accident Insurance, 1949, Fifty-ninth Year, Philadelphia.

² Based on the coverage at the end of 1948.

³ The entire indemnity payments are attributed to disabilities that last not more than 26 weeks. It is assumed that 80 percent of the payment for medical indemnity was to employees; and 90 percent of the benefit payments was for loss of working time.

⁴ Only a fraction of the losses incurred through partial disability, and hardly any caused by premature deaths are included in these estimates.

⁵ Includes disability benefits under life insurance contracts but takes no account of waiver of premiums.

Source: Sanders, Barkev S.: In a volume dealing with employment and wages prepared for the Twentieth Century Fund by W. S. Woytinsky and Associates, to be published in 1951.

Benefits From Plant Health and Medical Services

Peculiarly enough, a good medical service benefits the employee first and probably the most because the employer cannot expect to derive any benefit therefrom until the service has first helped the worker. "Health security" therefore means working spans that are longer and more profitable for the worker and his family. "Health security" for the employer means less labor turnover, less absenteeism from injury or illness whether industrial or nonindustrial, reduced compensation costs, and happier and more efficient workmen. In the past industry has expended considerable effort and vast sums in maintaining its machinery and physical plants and found it to be "good business." The human machine in industry should receive no less attention for, after all, the human element is the most important factor in the structure, operation, and product of any industrial organization.

Quoted from Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1946, page 4.

This report presents some findings from a study conducted in Denver, Colo., on the effect of a health service on sickness-absentee rates of Federal employees. The study was carried out through the cooperation of Federal agencies located at the Federal Center and in downtown Denver.

The main purpose of the study was to appraise the effect of health services on the use of sick leave by employees at the Federal Center, Denver. Accordingly, differences in the number of requests and hours of sick leave between employees at the Federal Center and downtown Denver were studied for two 6-month periods—before either group had available to it a preventive health program, and after such a program was established at the Federal Center.

A sample of 400 employees was selected at the Denver Federal Center representing a cross section of the 3,425 employees then working there. These employees were matched with 400 Federal employees working in downtown Denver of approximately the same occupation and Civil Service classification and of the same sex who did not have the services of a health program available to them. Sick-leave records for the periods October 1947 through March 1948, and October 1948 through March 1949 were obtained for each employee from their respective agencies. The differences in sick leave taken by each of these groups were studied.

SUMMARY

1. The preventive health service for employees at the Federal Center, effected a savings in sick leave which amounts to seven-eighths of the first year's cost of operation.

The availability of a health service at Federal Center reduced sick leave an average of 6 hours annually per employee over the downtown Denver group. Six hours saved for each of 3,425 employees working at Federal Center means a total of 20,550 hours saved. Since the typical Federal employee earns approximately \$1.60 an hour, the savings in dollars amounts to \$32,880. The preventive health service operation costs approximately \$38,000 during the first fiscal year.

2. As the program establishes itself it will more than pay for itself in reduction of sickness-absenteeism. Locating and concentrating on those employees who can benefit from early treatment, the establishment of good health habits, and by preventing the spread of communicable diseases, further reduction may be anticipated.

About half of the employees account for about three-quarters of the requests for sick leave and more than four-fifths of the hours of sick leave taken. . . .

FINDINGS

The availability of preventive health services reduced sickness-absentee rates of the employees at Denver Federal Center but not for the employees in downtown Denver where preventive health services were not available.

Denver Federal Center:	<i>Percent decrease</i>
Total requests for sick leave	0.6
Requests per employee	3.0
Total hours sick leave used	3.7
Hours of sick leave per person	3.8

Downtown Denver:

	<i>Percent increase</i>
Total requests for sick leave	13. 0
Requests per employee	5. 0
Total hours sick leave used	7. 8
Hours of sick leave per person	7. 7

The savings effected in sick leave by the availability of a preventive health service amounted to seven-eighths the cost of the first year's operation of the health service.

Annual savings per person in sick leave hours	6. 0
Number of employees at Federal Center	3, 425
Therefore, the total number of hours saved annually is	20, 550
The average Federal employee earns per hour	\$1. 60
The total saved would equal	\$32, 880
The first fiscal year of operation of the Federal Center cost approximately	\$38, 000

As the program establishes itself further savings may be anticipated, by treating and working with groups of employees who contribute, disproportionately to sickness-absentee rates.

Quoted from U. S. Public Health Service, Division of Federal Employee Health: The Effect of Health Services on Sickness-Absentee Rates of Federal Employees in Denver, 1950. (Processed.)

Analysis of the information provided by the representative 2,064 replies to the National Association of Manufacturers' survey on factory health programs revealed (that) . . . health programs have proved their worth to the companies instituting them.

a. An estimate on the basis of reductions in various health hazards reported in this survey revealed that a health program saves the average 500-employee plant \$5,611 net per year.

b. All but 5 of a total 1,625 respondents considered their programs paying propositions.

c. Over 90 percent of those replying indicated reductions in accident frequency, occupational disease, absenteeism, and compensation insurance premiums.

d. Between 85 and 90 percent indicated reductions in labor turnover, in addition to 83 percent which reported a good effect on their labor relations.

e. Specific percentage reductions as follows were reported:

	<i>Percent</i>
Accident frequency	44. 9
Occupational disease	62. 8
Labor turnover	27. 3
Absenteeism	29. 7
Compensation insurance premium	28. 8

Other improvements in factory conditions were reported as follows:

	Number of replies	Percentage of replies indicating reductions
Compensation insurance premium.....	1,067	93
Absenteeism.....	1,008	92
Labor turn-over.....	924	87

Following is a table showing the number of companies estimating specific reductions and the percentages of reductions reported:

	Number of replies	Average per cent reduction reported
Compensation insurance premium.....	454	28.8
Absenteeism.....	234	29.7
Labor turn-over.....	186	27.3

Quoted from National Association of Manufacturers: Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments. New York, The Association, 1941, pages 14, 19.

Health and economic benefits resulting from the program consist of:

1. Frequent and readily available consultation with plant physician and nurse.
2. Early diagnosis of minor and serious diseases and their prompt treatment.
3. Recognition of communicable diseases and their prompt treatment.
4. Control of hazardous working conditions.
5. Participation of the plant in group programs leading to improved health knowledge and practices.
6. Lowered compensation premium rates.
7. Proper sickness absence recording and control.
8. Improvement in plant morale.

Quoted from Millman, Nathan; Calderone, Frank A.; and Greenburg, Leonard: "Cooperative Plan for the Development of a Small Plant Health and Industrial Hygiene Program in New York City." Industrial Medicine, 15: 376 (June) 1946.

Table 115.—Distribution of surveyed establishments according to report on special benefits derived from medical department operations¹

Benefit	Total surveyed	Establishments				
		Reporting—			Not answering	With no medical department
		Yes	No	No opinion		
		Number				
Improves employee health.....	333	237	6	48	39	3
Improves employee efficiency.....	333	230	6	47	47	3
Reduces employee turnover.....	333	170	16	95	49	3
Promotes safety.....	333	255	5	33	37	3
Reduces absenteeism.....	333	237	7	46	40	3
Reduces cost ratio of insurance.....	333	191	12	69	58	3
Assists in proper placement.....	333	259	9	24	38	3
Improves employer-employee relations....	333	247	2	38	43	3
		Percent				
Improves employee health.....	100	71.2	1.8	14.4	11.7	0.9
Improves employee efficiency.....	100	69.1	1.8	14.1	14.1	.9
Reduces employee turnover.....	100	51.1	4.8	28.5	14.7	.9
Promotes safety.....	100	76.6	1.5	9.9	11.1	.9
Reduces absenteeism.....	100	71.2	2.1	13.8	12.0	.9
Reduces cost ratio of insurance.....	100	57.4	3.6	20.7	17.4	.9
Assists in proper placement.....	100	77.8	2.7	7.2	11.4	.9
Improves employer-employee relations....	100	74.2	.6	11.4	12.9	.9

¹ Data are based on a survey of 333 industrial establishments in the United States and Canada—a few Canadian companies participated. Industries covered a work force of more than 1.5 million persons, with 6.9 percent of the establishments employing less than 250 workers and 20.1 percent 5,000 or more. More than 30 types of industrial groups participated. With only 2 exceptions, not more than 10 percent of the 333 cooperating establishments were in any 1 group (machinery, 10.8; metals, 13.2).

Source: Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96) New York, National Industrial Conference Board, Inc., 1948, p. 72.

Table 116.—Estimated minimum expectancy in savings to employer and to employees from indicated reduction of the accident rate and of the time lost on account of sickness (or an equivalent reduction in mortality), demonstrated as attainable, for establishments in which the industrial accident rate is considerably below the average and in which there are no occupational health hazards

Items in the saving	Annual saving, per 1,000 employees
To the employer:	
Reduction of 7 compensable accidents from the present rate per 1,000 employees, or an equivalent decrease in noncompensable injuries and no-injury accidents which destroy property.....	\$8,600
Reduction of $\frac{3}{4}$ of a day in the sickness time-lost rate per 1,000 workers, or the equivalent in decreased mortality, estimated as worth to the employer $1\frac{1}{2}$ times the amount paid in wages (average daily wage of \$4 assumed).....	4,000
Total to the employer.....	12,600
To the employees:	
Amount which employees spend for medical services which may be furnished by an industrial physician.....	3,600
Value of wages at \$4 per day, saved by a reduction of $\frac{3}{4}$ of a day in the sickness time-lost rate per 1,000 persons, or the equivalent in decreased mortality.....	2,600
Total to the employees.....	6,200
To both employer and employees.....	18,800

Source: Brundage, Dean K.: "An Estimate of the Monetary Value to Industry of Plant Medical and Safety Services." Public Health Reports, 51: 1158 (Aug. 21), 1936. (Reprint No. 1765.)

SECTION VII

General Medical Care Plans for Industrial Workers

General Medical Care Plans

Historical Basis

A century ago, even a half-century ago, the average citizen in this country was a farmer or dwelt in a small community. He provided against the costs of disabling illness by the simple method of saving money. With his savings he could pay for the limited medical treatment available. And it was limited! It will be recalled that anesthesia was discovered only 105 years ago and its widespread use was delayed for decades. Major surgery was a rarity. There was no radium treatment, no X-ray treatment, no fluoroscopes, and few hospitals. Treatment of chronic illnesses was rudimentary and inexpensive. Since that time illness hasn't changed, but the diagnosis and treatment of it has changed radically, and so has the cost of caring for it.

The average citizen's social and economic position has also changed, for he left the small community and the individual enterprise and went to a city to become an employee of a corporation. He was no longer close to the source of his daily bread. Illness and its expense spelled economic calamity unless some pool could be tapped to tide him over until health returned. Individual budgeting proved inadequate; group budgeting became a "must."

Quoted from Plumley, H. Ladd: *Budgeting the Costs of Illness*. New York, National Industrial Conference Board, Inc., 1947, page 2.

The earliest efforts to cushion the risk of sickness were made by workers themselves in the late eighteenth and early nineteenth centuries. They first took the form of mutual aid societies which paid cash benefits to the family, on the death of the breadwinner, for burial expenses, and for general aid. Later cash benefits were paid in the event of prolonged sickness. The historic origin of these organizations is found in England's "friendly societies" or Germany's workmen's orders, although somewhat similar patterns are found even in antiquity. Some of these benevolent associations, like the Free African Society, later became insurance companies. Others gradually assumed "industrial" functions, like collective bargaining for wages and hours, and became labor unions in the current sense.

Whether mutual aid societies became departments of unions or continued independently, their principal function became cash indemnification of workers for wage loss during periods of temporary disability due to sickness or injury. The course of these "mutual sick benefit associations" or the "sick benefit funds" of unions was stormy. Rarely based on sound actuarial principles, they frequently got into financial difficulties. In the interest of improved personnel relations,

employers gradually began to sponsor them, offering clerical assistance or even partial assumption of the risk to induce employees to join. Employers seldom made significant financial contributions, however, and workers frequently refrained from joining on suspicion of management's objectives.

Quoted from Janis, Lee, and Roemer, Milton I.: "Medical Care Plans for Industrial Workers and Their Relationship to Public Health Programs." *American Journal of Public Health*, 38: 1246-47 (September) 1948.

In the slow development of voluntary health insurance in America, there has gradually appeared another avenue of attack upon the risks of sickness—the medical approach. This avenue leads directly toward the provision of medical care on a prepayment basis, either in association with cash compensation against wage loss or without any such connection. Historically, this approach was promoted by certain conditions in American industry. In bituminous coal mining, the working conditions are such that a large number of miners and their families would be without medical care for accident or illness if no organized provision were made by or with the cooperation of the industry. In American lumbering, the cut-and-strip policy, followed until recently, required lumber camps with a large number of workmen in an area commonly isolated from any medical facilities. A similar situation faced metal mining and other industries located in sparsely settled areas and our western railroads, built through unsettled country. . . .

Occasionally the industrial establishment took the whole financial responsibility. . . . Much more commonly, a payroll deduction of from \$1 to \$2 a month has been made from each employee's wage. Sometimes this is supplemented by the employer; or the employer provides certain facilities, especially hospitals, which require considerable capital. Typically, the management of these plans has been largely in the hands of the employees, through representatives chosen by them or by their mutual benefit association. Usually the industrial management is also represented on the governing board. Greater emphasis was given to the medical approach by the absence of hospital facilities in many of the areas with which these industries were concerned. Sometimes, as suggested, the industries built hospitals directly; sometimes, hospitals developed as proprietary establishments of physicians, most of whom would never have entered the area, much less established a hospital, without a contract with the industry or an association of employees, through which they were assured patients and payment.

Quoted from Davis, Michael M.: *America Organizes Medicine*. New York, Harper & Bros., 1941, pages 147-148.

The enactment of State workmen's compensation laws directly influenced this development. One of the first of these laws was passed in the State of Washington in 1911; it required that the em-

ployer compensate the worker for loss of earnings but did not make it compulsory for him to provide medical care. The Medical Aid Act passed in that State in 1917 required the employer and employee to contribute equal amounts to defray the cost of medical care for industrial accidents and injuries. Subsequently many groups of employees increased their share of contributions to finance medical services for all injuries and illnesses regardless of origin. A similar law providing for employer-employee contribution toward the cost of medical care was passed in Oregon in 1913. . . .

Quoted from Klem, Margaret C.: *Prepayment Medical Care Organizations*, 3d ed. (Social Security Board, Bureau of Research and Statistics Memorandum No. 55). Washington, Government Printing Office, 1945, page 1.

In the light of current developments, the early industrial experience is chiefly interesting for the precedents established:

1. The assumption by industry of responsibility for providing workers with medical care in areas having insufficient medical facilities or none;
2. The use of the periodic prepayment method to finance part or all of the program; and
3. The use of payroll deductions as the means of collecting workers' share of prepayments.

Quoted from Avnet, Helen Hershfield: *Voluntary Medical Insurance in the United States: Major Trends and Current Problems*. New York, Medical Administration Service, Inc., 1944, page 1.

Types and Characteristics

Health insurance, compulsory or voluntary, may assume any of three forms:

1. It may take the form of cash benefits to compensate the insured for loss of earnings while indisposed; these are "disability benefits."
2. It may indemnify the insured in cash payment for medical expenses incurred; this is called "medical expense indemnity" or "medical reimbursement" insurance.
3. It may dispense with cash benefits and provide the insured with medical services. This form is usually referred to as "prepaid medical care or medical service insurance."

Quoted from Avnet, Helen Hershfield: *Voluntary Medical Insurance in the United States: Major Trends and Current Problems*. New York, Medical Administration Service, Inc., 1944, Introduction.

Prepayment plans may be classified as follows: Blue Cross plans, which provide hospitalization (and in a few instances medical care), and medical care plans, which provide medical or medical and hospital benefits. When the medical care plans are grouped according to sponsor, they fall into the classifications of industrial, medical society, private group clinic, consumer-sponsored, and governmental plans.

Industrial plans are associated with some particular industry or firm. They may be financed by employer or by employees, or jointly by employer and employees. These plans provide care for employees, and frequently their dependents. Financial arrangements often are made whereby the medical staff of the prepayment plan provides care for both industrial and nonindustrial accidents and illnesses.

Medical society plans are sponsored by either State or local medical societies. Private group clinic plans are those established and managed by physicians who practice as a group. Consumer-sponsored plans are established and controlled by the groups for whom the medical care is furnished. Government plans include both Federal and municipal programs established for the benefit of employees or for certain specified groups.

Quoted from Klem, Margaret C., and McKiever, Margaret F.: "Program Developments and Benefit Trends in Voluntary Health Insurance." *Social Security Bulletin*, 11:3 (November) 1948.

From the standpoint of the number of participants, the leading type of existing prepayment or insurance plans is the Blue Cross hospital service plans. The distinguishing features of these plans are that they are nonprofit, that the subscriber has free choice among the hospitals of the area, that they are sponsored or endorsed by the hospitals of the area, that they operate through contracts with the member hospitals which in return for specified payments agree to provide specified services to subscribers, and finally that the plans meet the standards of and are approved by the American Hospital Association. The Blue Cross plan movement, from its beginning in 1932, has grown with great rapidity . . . A few Blue Cross plans have expanded their services to include certain types of physicians' services, mainly surgery and obstetrical service. . . .

Closely allied with hospital service plans are the nonprofit, free-choice medical service plans, sponsored by medical societies. The major development of these plans has come since 1939 . . . Most of the medical service plans cover either surgical and obstetrical service only, or these services and physicians' services for hospitalized medical cases. Only a few cover physicians' service in the office and home, and generally such coverage is restricted to employed persons. All of the separate medical plans, with four exceptions, are jointly operated with the hospital service plans of their areas in that the hospital service plan enrolls new subscribers, collects subscription charges, and maintains subscriber records for the medical plan, or there is joint control over these activities. . . .

Quoted from Reed, Louis S.: *Blue Cross and Medical Service Plans*. Washington, United States Public Health Service, 1947, pages 1-4.

While it is true that the financial hazard of serious illness cannot be entirely reckoned in advance, it can be relieved by group action in which many families contribute to a common fund from which those

who are ill may draw in time of need. The uncertainty of a large expenditure is thus replaced by the certainty of a small one—the regular payment of an insurance premium. This, then, is the basis for voluntary health insurance. It is a method of budgeting ahead of time for the costs of serious illness—for medical and hospital care.

The American Medical Association has officially defined health insurance as “a method of transferring the economic burden of sickness from the individual to the group.” Health insurance may be voluntary or compulsory. Voluntary health insurance is that system whereby individual costs are spread over a period of time by a group of people who voluntarily band together to protect themselves against the economic burden of sickness. It involves both the insurance principle and an organized system of premium payments. . . .

The American Medical Association has officially supported the voluntary health insurance plans since 1934 and began to participate actively in the promotional phase about 1944. In 1943 its House of Delegates created a Council on Medical Service and Public Relations and provided that one of its functions should be to study the trends in medical care programs and report these trends to the House of Delegates, the profession, and the public. This council immediately set about interesting every State medical association in voluntary health insurance. No pattern was set, no model plan offered, but each medical association was urged to make some type of plan available to the public. . . .

One of the needs that soon became evident to the council was for a national coordinating agency similar to the Blue Cross Commission to assist the plans in developing sound underwriting, uniform statistical data, adequate selling programs, etc. For this purpose Associated Medical Care Plans was created in 1945 and incorporated as a trade association. This organization has adopted the Blue Shield as its symbol and has as its members some sixty of the hundred medical society plans.

Quoted from Holman, Edwin J., and Cooley, George W.: “Voluntary Health Insurance in the United States.” *Iowa Law Review*, 35:185, 203-204 (Winter) 1950.

Group insurance accounts for the major portion of the health insurance benefits in force with insurance companies. The benefits are provided by means of a master contract issued usually to an employer, but sometimes to a labor union or the trustees of a welfare benefits fund established through collective bargaining. Benefits of various types are provided under these contracts for employees or the members of a union and for their spouses and dependent children. . . .

Group hospital expense benefits commonly consist of two parts. The first is an allowance for the cost of the hospital room and board, and the second is the additional provision for other hospital charges such as for the use of the operating room, for X-ray examinations and laboratory tests and the like. The room and board allowance

may range from \$5 to as much as \$12 for each day of hospital confinement and may be payable for a maximum period of 31 days or 70 days, or as long as 180 days in any one hospitalization. Maternity cases are usually limited to a maximum of 14 days benefits for any one pregnancy. The allowance for the cost of auxiliary hospital services is generally a function of the daily room and board rate. Plans may be written providing 10 times, 20 times, or as high as 50 times the daily room and board rate for incidental hospital charges. Thus, where \$10 was the daily room and board benefit rate, a 20 times plan would provide a maximum of \$200 for other hospital charges during any one confinement. . . .

Group surgical expense insurance is provided by means of a schedule of maximum benefits setting forth different amounts of reimbursement dependent upon the type of operation. . . . This schedule provides, for example, a maximum benefit of \$100 for the performance of an appendectomy, \$30 for a tonsillectomy, \$200 for an operation on a brain tumor or a serious abdominal operation, and \$50 for a normal childbirth. In those areas, for instance in the large metropolitan cities, where in the light of the general level of surgeons' fees the amounts provided in the basic schedule may be too low to furnish sufficient insurance, increased amounts of insurance are available in terms of multiples of the basic schedule, in which all amounts are increased proportionately. Coverage is provided for all operations regardless of whether they take place in the hospital, in the doctor's office, or elsewhere. . . .

Within the last 6 or 7 years the companies have been offering additional plans of group medical expense insurance designed to cover medical expenses not related to surgery. These plans vary considerably in detail because they are still in the formative stages. Some offer very limited additional protection and others are quite comprehensive. . . .

The companies have also developed and are offering a comprehensive plan under which coverage is provided for nondisabling illnesses, as well as those resulting in inability to work. This plan is available for both the wage earner and his family. It is really comprehensive in that all doctor's visits are covered, including reimbursement for periodic health check-ups, well-baby care, immunizations, and the like. The basic amounts of reimbursement are \$2 for each office call and \$3 for each house call. Again where the basic amounts would be insufficient in the light of doctors' charges, plans with higher amounts of reimbursements are available.

The comprehensive plan may be expanded even further to provide coverage additional to that for doctors' visits in the form of specific allowances for diagnostic X-ray and laboratory examinations performed at the doctor's office or in the patient's home. These benefits

for X-ray and laboratory examinations are in accordance with a schedule depending on the type of examination. Examples from the schedule are the allowance of \$7.50 for an electro-cardiogram or \$10 for an X-ray examination of the head. . . .

The patient has full freedom of choice to pick his own physician and makes his arrangements as to fees directly with the doctor. The insurance merely reimburses the individual for the cost of the doctor's services up to the limit of benefits provided in the insurance contract. The patient is responsible for any additional doctor's charges. . . .

Quoted from Miller, Morton D.: "The Program of the Insurance Companies." *American Journal of Public Health* 40:1125-1128 (September) 1950.

The purpose of temporary disability insurance is to reimburse for loss of working time while the individual is disabled by accident or sickness. A weekly benefit is provided, usually starting after a short waiting period of disability and continuing during disability up to a specified maximum duration. The most frequently used waiting period is 7 days, although a 3-day period is not uncommon, and there are some as long as 14 days. In many instances, there is no waiting period for disability due to accident.

The maximum duration of benefits for any one disability varies from group to group, but it is seldom shorter than 10 weeks or longer than 26 weeks. While the most popular limit has been 13 weeks, lately the 26-week maximum, required in California and New Jersey, has increased in popularity. Nearly all plans limit the duration in maternity cases to 6 weeks.

The rate of indemnity is sometimes a flat amount per week for each person, although more often it is varied in relation to the individual's earnings. Frequently, it is expressed as a stated percentage of earnings or as a stated amount for each of several wage classes. To avoid over-insurance, the amounts seldom exceed two-thirds of normal earnings.

There is also available, as a supplement to temporary disability insurance (or to group life insurance), a form of accident coverage known as group accidental death and dismemberment insurance. It provides a stated principal sum, payable in the event of accidental death or certain major accidental dismemberments or loss of sight, and provides a fraction of the principal sum, payable in the case of certain less severe dismemberments. While it is frequently written to cover non-occupational accidents only, all accidents may be covered with only a moderate additional premium. The amounts of principal sum are often determined according to earnings or so as to parallel amounts of group life insurance.

Quoted from Smith, J. Henry: "Group Insurance Against Illness and Accidents." *American Economic Security*, 7: 12 (June-July) 1950.

Enrollment

Table 117.—Estimated number of persons eligible for specified health and disability benefits through voluntary programs, by type of program, United States, Dec. 31, 1949¹

Type of program	Number of persons eligible for medical and hospital benefits		
	Hospital	Surgical	Medical
Total coverage.....	70,501,000	43,353,000	17,429,000
Deduction for estimated duplication.....	4,457,000	2,210,000	587,000
Estimated total persons eligible.....	66,044,000	41,143,000	16,842,000
Group insurance, total.....	17,697,000	15,590,000	2,736,000
Subscribers.....	8,500,000	8,398,000	1,712,000
Dependents.....	9,197,000	7,194,000	1,024,000
Individual insurance, total.....	14,729,000	9,315,000	2,350,000
Subscribers.....	8,550,000	5,359,000	1,561,000
Dependents.....	6,179,000	3,956,000	789,000
Blue Cross plans and plans sponsored by medical societies.....	34,315,000	14,628,000	8,508,000
Subscribers.....	14,761,000	6,338,000	3,788,000
Dependents.....	19,554,000	8,290,000	4,720,000
Other organizations, total.....	3,780,000	3,820,000	3,825,000
Bituminous coal industry:			
Subscribers.....	225,000	265,000	265,000
Dependents.....	300,000	350,000	350,000
Consumer sponsored.....	1,600,000	1,600,000	1,600,000
Industrial, excluding coal mining.....	1,260,000	1,220,000	1,215,000
Private group clinics.....	275,000	285,000	305,000
University health plans.....	100,000	100,000	100,000
	Number of persons eligible for disability benefits		
Total coverage.....	36,417,000		
Deduction for estimated duplication.....	2,281,000		
Estimated total persons insured.....	34,136,000		
Group insurance.....	10,260,000		
Individual insurance.....	13,687,000		
Paid sick leave:			
In private industry.....	4,560,000		
In civilian government service.....	4,750,000		
Employee mutual benefit associations.....	1,460,000		
Union plans and other employer-employee methods.....	1,700,000		

¹ Since the purpose of this survey is to measure the extent and growth of coverage under employer-employee and other voluntary programs, individuals covered solely by Government insurance under compulsory plans have not been included in the total number of persons protected against loss of income due to disability. Also omitted from the survey are the following types of protection: Workmen's compensation providing protection to the majority of wage earners against occupational accidents and diseases; total and permanent disability benefits included in many life insurance policies; commercial accident policies providing disability indemnity and other benefits in event of accidental injuries; group accidental death and dismemberment insurance; commercial accident policies covering travel hazard; complete medical care for persons in the Armed Forces; complete medical care for persons in public institutions; medical care and disability pensions available under certain conditions to war veterans; protection under automobile and all other types of personal injury liability policies; and medical payment provisions under many automobile, residence liability, and other types of liability policies.

Source: The Survey Committee of the Health Insurance Council: A Survey of Accident and Health Coverage in the United States. New York, The Council, 1950, p. 5.

Table 118.—Number of persons enrolled in Blue Cross plans, and percent of population enrolled, by State and Territory, Mar. 31, 1950

State and Territory	Number of persons enrolled	Percent of State or Territorial population enrolled ¹	State and Territory	Number of persons enrolled	Percent of State or Territorial population enrolled ¹
United States and Territories.....	34,914,239	23.29	Missouri.....	1,270,562	32.30
Alabama.....	* 357,019	12.26	Montana.....	118,036	22.83
Arizona.....	112,667	15.29	Nebraska.....	161,033	12.56
Arkansas.....	30,905	1.68	New Hampshire and Vermont.....	250,462	27.58
California.....	1,207,646	11.47	New Jersey.....	1,433,416	29.92
Colorado.....	424,531	35.41	New Mexico.....	20,229	3.50
Connecticut.....	1,004,382	45.45	New York.....	5,977,657	41.59
Delaware.....	173,328	55.91	North Carolina.....	608,474	15.96
District of Columbia.....	431,843	51.41	North Dakota.....	* 69,293	11.45
Florida.....	242,856	9.89	Ohio.....	* 3,041,462	38.11
Georgia.....	133,644	4.24	Oklahoma.....	339,817	14.85
Idaho.....	50,279	8.52	Oregon.....	80,923	4.67
Illinois.....	2,165,451	25.77	Pennsylvania.....	* 4,101,814	38.63
Indiana.....	572,046	14.33	Rhode Island.....	556,871	75.56
Iowa and South Dakota.....	625,679	19.03	South Carolina.....	116,500	5.88
Kansas.....	376,386	19.59	Tennessee.....	420,735	13.07
Kentucky.....	* 288,260	10.00	Texas.....	556,829	7.51
Louisiana.....	243,743	9.30	Utah.....	75,270	11.05
Maine.....	* 251,860	27.77	Virginia.....	466,404	15.33
Maryland.....	* 746,384	34.86	Washington.....	100,107	3.96
Massachusetts.....	* 1,807,322	38.52	West Virginia.....	225,001	11.59
Michigan.....	1,748,445	27.56	Wisconsin.....	* 741,836	22.12
Minnesota.....	* 1,004,084	33.74	Wyoming.....	52,131	18.45
Mississippi.....	64,121	3.02	Puerto Rico.....	68,496	3.20

¹ Estimated population July 1, 1949.
² Estimated.

Source: Blue Cross Commission: Blue Cross Enrollment, United States and Territories as of Mar. 31, 1950. Chicago, The Commission, 1950. (Processed.)

Table 119.—Number of persons enrolled in medical service plans and percent of population enrolled, by State and Territory, Mar. 31, 1950 ¹

State and Territory	Number of persons enrolled	Percent of State or Territorial population enrolled ²	State and Territory	Number of persons enrolled	Percent of State or Territorial population enrolled ²
United States and Territories.....	14,687,430	9.75	Indiana.....	386,693	9.69
Delaware.....	155,665	50.21	Nebraska.....	121,092	9.45
Michigan.....	1,559,544	24.58	Wyoming.....	23,152	8.30
District of Columbia.....	205,750	24.49	Oklahoma.....	185,913	8.13
Colorado.....	277,854	23.17	New Jersey.....	371,441	7.70
New Hampshire—Vermont.....	200,818	22.12	Arizona.....	55,675	7.55
Washington.....	511,873	20.26	Iowa.....	199,522	7.55
Montana.....	102,439	19.81	Alabama.....	202,683	6.96
Massachusetts.....	907,405	19.34	Florida.....	165,570	6.74
New York.....	2,261,300	15.74	Pennsylvania.....	626,878	5.89
North Carolina.....	570,313	14.96	Louisiana.....	123,518	4.71
Missouri.....	497,280	12.64	Texas.....	328,093	4.43
California.....	1,297,067	12.32	Utah.....	29,938	4.40
Wisconsin.....	413,376	12.32	Mississippi.....	62,853	2.96
Connecticut.....	243,301	12.07	North Dakota.....	16,765	2.77
Oregon.....	206,230	11.89	New Mexico.....	15,295	2.65
Ohio.....	904,503	11.33	Illinois.....	206,669	2.48
Minnesota.....	315,226	10.59	Arkansas.....	29,138	1.49
Kansas.....	201,851	10.51	Tennessee.....	47,850	1.49
West Virginia.....	196,439	10.12	Kentucky.....	40,871	1.43
Virginia.....	305,307	10.04	Hawaii.....	44,784	8.92
			Puerto Rico.....	68,496	3.20

¹ In addition to enrollment in Blue Shield plans, figures include enrollment in 9 non-Blue Shield plans which, with 1 exception, are medical service plans, affiliated with Blue Cross hospital plans.
² Estimated population July 1, 1949.

Source: Associated Medical Care Plans: Enrollment Reports, Blue Shield Plans, First Quarter 1950. Chicago, Associated Plans, 1950, pp. 7-8.

Evaluation

The Quality of Medical Care

Medical care of good quality requires well trained personnel, adequate facilities, and a reasonably comprehensive scope of service.

Highest standards of medical care are achieved only with the wise and efficient organization of these resources. This key factor determines the actual effectiveness of the personnel, the facilities, and the services.

Efficient organization of personnel involves group medical practice in health centers; of facilities—regionalized planning for coordinated hospital networks; and of services—continuity through the full range of health care. These emerge, therefore, as the organizational triad most essential to improvement of the quality of medical care.

When sound financing and competent administration provide the firm foundation for such an organizational structure, high standards of service are protected. When provision is made for generous support of education and research in the health services, the constant elevation of these standards is assured.

Quoted from American Public Health Association, Subcommittee on Medical Care: "The Quality of Medical Care in a National Health Program." *American Journal of Public Health*, 39:922 (July) 1949.

To make financial arrangements for groups of subscribers and disburse funds to those rendering care is one thing, to provide for quality of service, quite another. Adoption of a prepayment plan without simultaneous organization of professional and institutional services meeting high standards and without building a suitable and efficient administration merely perpetuates old evils. It might make poor medical care more easily available by precluding improvements in the practice of medicine, dentistry, nursing, and related professions. In the words of C.-E. A. Winslow, "We have no right to collect either tax money or insurance funds for medical care without due assurance that real value will be received." There is grave danger of unconditional surrender to the forceful argument that protection against the economic hazards of ill health is the one and only problem to be solved by prepayment plans.

Quoted from Goldmann, Franz: *Voluntary Medical Care Insurance in the United States*. New York, Columbia University Press, 1948, page 201.

Criteria for Evaluating Prepayment Medical Care Plans

1. The extent to which a prepayment plan makes available to those it serves the whole range of scientific medicine for prevention of disease and for treatment of all types of illness or injury.

2. The proportion of the population of its area—local, State, or national, as the case may be, covered by a plan. (Cost in relation to ability to pay, restrictions on enrollment imposed by actuarial considerations, income level, age, conditions of employment, means of securing enrollment, and collecting premiums.)

3. The degree to which a plan makes use of and encourages the development of a high quality of medical care for its subscribers. (Standards of personnel and facilities, organization of services, emphasis on prevention of disease, promotion of health, health education.)

4. The degree to which freedom and willingness to experiment with methods of payment and operation are encouraged in a plan.

5. The degree to which a plan succeeds in arranging amounts and methods of payment and conditions of participation that are satisfactory to physicians, hospitals, and others serving the plan's subscribers.

6. The extent to which efficiency and economy in the operation of a plan are achieved and encouraged by its basic policies and its administrative techniques.

7. The extent to which the individuals or board who carry the ultimate responsibility for a plan represent the interests of those entitled to service and those who are paying the cost, as well as of the physicians, hospitals, or others who are providing the services.

Quoted from Clark, Dean A.: "Criteria for Evaluating Prepayment Plans." *America's Health: A Report to the Nation* by the National Health Assembly. New York, Harper & Bros., 1949, pages 207, 217.

Suggested Principles for Lay Sponsored Voluntary Health Plans

[Editor's note: Prepared by the Council on Medical Service of the American Medical Association in cooperation with representatives of lay groups, and approved by the House of Delegates of the American Medical Association, June 1949. The Reference Committee on Insurance Plans and Medical Service of the House of Delegates in submitting the Suggested Principles stated: ". . . Your reference committee recommends that these points be forwarded by the House of Delegates to all State and county medical societies, which societies should use them as a guide in determining the eligibility of any such plans for approval by those State or county societies. These 20 points have been tentatively initiated by representatives of the Council on Medical Service and the Cooperative Health Federation of America. It should be recognized that local areas may find it necessary to make minor modifications without changing the fundamental intent involved. Your committee recommends that any lay sponsored plan desiring approval by a proper accrediting body of the American Medical Association shall come bearing the endorsement of the State or county medical association involved.]

1. The plan shall be nonprofit, paying no dividends to beneficiaries or others; all surplus earnings shall be devoted either to improving the services, to making compensation of physicians and other staff members more adequate for their responsibilities and services, to purchasing facilities and equipment, to increasing the scope of benefits, or to building adequate reserve funds. All income to the plan shall be devoted to services for beneficiaries.

2. The plan shall comply with the Principles of Medical Ethics of the American Medical Association, which provide that it is unprofessional for a physician to dispose of his professional attainments or services to any lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit a direct profit from the fees, salary, or compensation received to accrue to the lay body or individual employing him.

3. If incorporated, the plan shall be adequately financed and organized without capital stock.

4. The plan shall be operated under an autonomous administration or trust, with segregated funds, and shall be devoted exclusively to the provision of health services.

5. Promotion, sales, organization, and administrative expense of the plan shall be kept at a minimum as judged by the accrediting body.

6. The quality of medical service shall be maintained at the highest possible level. All participating physicians shall be doctors of medicine [duly licensed to practice medicine] in any State in which the plan operates. Each physician engaged in the practice of a specialty shall be required to have adequate qualifications for that specialty. The personnel and facilities of the plan shall be adequate to insure a high quality of medical care.

7. The plan shall provide all services as set forth in the agreement with the beneficiary. When, in the opinion of the medical staff, a professional service set forth is not available because of an emergency or because of the need for highly technical procedure, or for any other reason, then such service shall be otherwise provided by the plan.

8. The plan, in its agreement entered into with the beneficiary and which shall be distributed to each beneficiary, shall state clearly the services and benefits to be provided and the conditions under which they will be provided. All exclusions, limitations, waiting periods, and deductible provisions shall be clearly stated in the agreement with the beneficiary and in promotional and descriptive literature.

9. The plan shall, in its agreement with the beneficiary, state clearly the amount of dues or subscriptions to be paid. The amount of dues or subscription shall be adequate to provide for the benefits and services offered and to insure proper financing of the risks involved.

10. No promotional material shall invite attention to the professional skill, qualifications, or attainments of the physicians participating in the plan.

11. Participating physicians may be compensated in any manner not contrary to the Principles of Medical Ethics of the American Medical Association relating to contract practice.

12. Any duly licensed physician in the community who wishes to participate in the plan, who meets its professional and personnel standards and who agrees to abide by its terms and the requirements of its beneficiaries shall be admitted to the plan.

13. The names of all participating physicians of the plan shall be made available to the prospective beneficiary. The beneficiary shall, within reasonable geographic and professional limitations, have free choice among participating physicians.

14. There shall be no interference by the governing body with the medical staff in the practice of medicine. The traditional and confidential relationship of the physician and patient shall be preserved.

15. Adequate provision shall be made for effective participation of the medical staff in the deliberations of the governing body. It is recommended that the membership of the governing body include representatives of the medical profession.

16. All services rendered by the participating physician, not included in the beneficiary's contract, shall be payable by the beneficiary to the participating physician on a fee for service basis.

17. The method of operation of any hospital owned or under contract to the plan shall be in accordance with sound public policy.

18. The plans shall provide for like rates, benefits, terms and conditions for all persons in the same class.

19. Investment of reserve funds shall be made only in securities deemed prudent for such purposes.

20. Any plan desiring approval under these principles shall agree to such periodic reviews and to abide by such regulations as may be deemed necessary by an appropriate accrediting body of the American Medical Association in consultation with representatives of the sponsors of the plan.

Quoted from American Medical Association, Council on Medical Service: "Proceedings of the Atlantic City Session." *Journal of the American Medical Association*, 140: 696-7 (June 25), 799 (July 2) 1949.

Medical Care and Other Employee-Benefit Plans

Health Provisions of Employee-Benefit Plans

Employers have come to realize that—apart from conditions on the job—the general health of their employees is a matter of concern to them. The good health of the workers is essential for high production.

Closely related to the matter of maintaining the health of employees is the problem of aiding them to meet their health bills. . . .

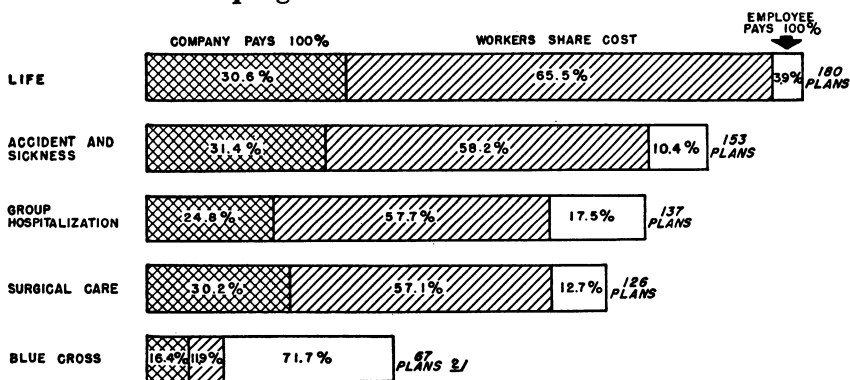
Insurance is perhaps the best means of distributing the costs of serious illness over groups of people and over periods of time.

As the result of efforts sponsored by the Chamber of Commerce of the United States there is now available more reliable information concerning the very broad scope of protection in effect through various forms of cash sickness or disability benefits, hospital expense benefits, surgical expense benefits, and medical expense benefits.

This protection is provided by insurance coverage of various kinds—in the main, through group policies issued to employers covering their employees—in some cases, as a result of collective bargaining. Much of the protection is provided under Blue Cross hospital plans and related prepayment plans. Also represented is a substantial volume of individual policies, protection provided through employer mutual benefit associations, and wage continuation sick benefit plans.

Quoted from Shreve, Earl O.: "The Employer and His Workers' Health." *American Economic Security*, 6:41, 43 (June) 1949.

Percentage distribution of group insurance plans, providing specified types of employee benefits, according to method of paying the cost of the program.¹



¹ Based on information received from 261 companies with group insurance plans adopted or revised since the end of the war. A minority of the plans had been made part of a union agreement. Of the 216 plans giving information on this point, 59.2 percent said that the plan had not been incorporated in the union agreement and 14.4 percent did not have a union in their establishments. Of the 26.4 percent of the plans reporting that they had reached an agreement with their unions, only 7.4 percent had made the complete plan a part of the agreement; the other 19 percent merely agreed to continue their plan. Approximately 2 million persons were employed in these companies. Percentages do not include payments for dependents of employees.

² Excludes programs where Blue Cross is provided in addition to other types of hospital benefits.

Source: National Industrial Conference Board, Inc.: "Who Pays for Employee Security? Company, Workers—or Both." *The Conference Board Management Record*, 11:445 (October) 1949; and "Contributory vs. Noncontributory Plans." *Ibid.*, 11:288 (July) 1949.

FIGURE 14.

Table 120.—Number of surveyed firms reporting on employee benefit programs, percent reporting specified type of program, and percent of employees in reporting firms covered, by employee size class and by industry group¹

Item	Reporting firms		Life insurance plan		Pension and retirement plan		Hospitalization plan		Surgical plan		Medical care plan	
	Number	Number of employees	Firms having	Employees covered	Firms having	Employees covered	Firms having	Employees covered	Firms having	Employees covered	Firms having	Employees covered
			Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
All firms.....	6,845	2,478,137	62.4	75.0	29.7	40.7	75.7	70.9	46.7	49.0	12.7	8.4
Employee size class:												
1 to 99.....	4,292	136,765	49.7	49.9	19.2	15.8	66.5	62.2	37.5	38.3	11.6	12.3
100 to 499.....	1,788	395,859	80.3	64.8	40.0	23.2	88.0	69.2	58.6	45.8	14.3	17.0
500 to 999.....	335	230,336	88.8	71.3	55.5	31.2	95.5	71.6	71.3	51.9	16.7	12.6
1,000 and over.....	430	1,715,177	93.3	79.8	72.8	48.0	97.4	71.9	70.7	50.3	13.5	7.0
Industry group:												
Manufacturing.....	3,085	1,676,295	69.7	78.7	31.6	34.3	82.8	71.4	52.9	54.5	14.2	7.3
Trade, retail and wholesale.....	1,877	315,272	56.7	59.2	23.7	39.4	71.4	70.6	41.1	35.2	11.4	6.9
Finance, insurance, real estate.....	688	94,647	70.8	79.6	48.5	56.8	77.0	77.0	50.4	55.7	14.2	12.9
Transportation, communication, utilities.....	265	266,555	78.9	82.6	42.3	85.0	81.9	74.2	61.1	40.2	17.0	15.4
Service.....	648	79,973	40.3	51.7	19.8	21.4	59.3	55.9	31.6	31.6	7.6	12.3
Construction.....	272	30,839	33.5	34.6	13.6	18.4	58.9	49.0	28.7	18.0	7.0	3.3
Mining.....	10	14,556	50.0	32.3	50.0	36.8	60.0	46.1	30.0	4.5	20.0	1.7

¹ Based on surveys of employee benefit plans conducted separately in the following 12 metropolitan areas which included a sixth of the total United States population: Atlanta, Chicago, Cleveland, Detroit, Houston, Indianapolis, Minneapolis-St. Paul, Philadelphia, Pittsburgh, St. Louis, Salt Lake City, San Francisco. Of the firms contacted 34.7 percent returned questionnaires. Employment in these firms was 27.4 percent of the nonagricultural employment in the 12 areas.

Source: Research Council for Economic Security: Employee Benefit Plans: Nation-Wide Survey, Twelve Metropolitan Areas (Publication No. 69). Chicago, The Council, 1950, pp. 9-23.

Table 121.—Distribution of firms reporting specified employee benefit program and of employees covered by percent of financial expense paid by employer¹

Percent of programs financed by employer	Life insurance plan		Pension and retirement plan		Hospitalization plan		Surgical plan		Medical care plan	
	Firms having	Employees covered	Firms having	Employees covered	Firms having	Employees covered	Firms having	Employees covered	Firms having	Employees covered
	Number									
100.....	1, 526	433, 755	1, 109	542, 071	1, 020	262, 137	827	227, 402	331	66, 085
51 to 99.....	1, 948	400, 393	1, 566	300, 055	391	123, 380	362	126, 647	89	26, 985
50.....	865	248, 964	278	117, 852	588	140, 353	566	147, 146	145	31, 364
1 to 49.....	762	609, 021	66	34, 723	491	228, 753	385	195, 754	83	30, 908
0.....	167	165, 042	17	13, 441	2, 694	1, 002, 237	1, 060	519, 189	218	53, 554
	Percent									
100.....	35.7	23.3	54.4	53.8	19.7	14.9	25.9	18.7	38.2	31.7
51 to 99.....	22.2	21.6	27.8	29.7	7.5	7.0	11.3	10.4	10.3	12.9
50.....	20.3	13.4	13.7	11.7	11.3	8.0	17.7	12.1	16.7	15.0
1 to 49.....	17.9	32.8	3.3	3.5	9.5	13.0	12.0	16.1	9.6	14.8
0.....	3.9	8.9	.8	1.3	52.0	57.1	33.1	42.7	25.2	25.6

¹ Based on surveys of employee benefit plans conducted separately in the following 12 metropolitan areas which included a sixth of the total United States population: Atlanta, Chicago, Cleveland, Detroit, Houston, Indianapolis, Minneapolis-St. Paul, Philadelphia, Pittsburgh, St. Louis, Salt Lake City, San Francisco. Of the firms contacted 34.7 percent (6,845 firms) returned questionnaires. The 2,478,137 persons employed in these firms was 27.4 percent of the nonagricultural employment in the 12 areas.

Sources: Research Council for Economic Security: Employee Benefit Plans: Nation-Wide Survey, Twelve Metropolitan Areas (Publication No. 69). Chicago, The Council, 1950, pp. 9-23.

The Correlating Committee on Medical Care for Industrial Workers has met twice—in Chicago on November 4, 1949, and in New York on February 18 and 19, 1950. Dr. William A. Sawyer, Rochester, N. Y., was elected chairman. The committee has set forth the following projects for its study and consideration:

a. A review of the scope of the medical care programs (nonoccupational) now available to industrial workers. This would include quality, costs, benefits, sponsorship, and control as well as what the profession is doing in this field and the role played by the specialty groups such as the industrial surgeons.

b. A definition to distinguish between industrial workers and other workers. For instance, should the term "industrial workers" include all gainfully employed workers, all occupational groups, or should it be considered in its limited sense?

c. A review and evaluation of the status of physicians in medical care programs for industrial workers, including the remunerative aspects as well as those having to do with administration.

d. A review of the trends in medical care for industrial workers from the point of view of schools of public health, from the point of view of its effect on the demands for compulsory sickness insurance, and from the point of view of changes in union policy.

[Editor's note: Correlating Committee on Medical Care of Industrial Workers; this committee was selected by the Council on Medical Service after conference with the Council on Industrial Health and will work closely with that council: Thomas A. McGoldrick, Brooklyn; Warren F. Draper, Washington, D. C.; Harold A. Vonachen, Peoria, Ill.; William A. Sawyer, Rochester, N. Y.; Frederick Slobe, Chicago; Leo Price, New York. See *Journal of the American Medical Association*, 141:679 (November 5), 1949.]

Quoted from American Medical Association, Council on Medical Service, "Report." *Journal of the American Medical Association*, 143:989 (July 15), 1950.

Relationships Between Industrial Health and Medical Care Plans for Workers

Many existing medical care plans are industrial in origin. Physicians in industry are frequently in excellent position to evaluate the health needs of employed groups and to determine ways of meeting them. Conferences [of the Council on Industrial Health of the American Medical Association] with the Council on Medical Service have confirmed this view to mutual advantage. Industrial medicine, with its primary interest in the promotion of individual effectiveness through preventive medicine and health conservation and with its roots deep in clinical medicine, performs its best function by narrowing the gap between the two. . . .

Quoted from American Medical Association, Council on Industrial Health "Report." *Journal of the American Medical Association*, 140:628 (June 18), 1949.

There exists considerable reluctance to include the function of complete medical care for workers within the scope of industrial hygiene. The most important reasons for this reluctance are: 1. A confusion of functions with personnel and responsibilities, . . . and 2. A lack of appreciation of the functional unity of medicine. . . .

In recent years there has been a growing recognition of the interdependence of preventive and therapeutic medicine. What is therapeutic for one person at a certain time, is often preventive for another person or for the same person at a different time. Conversely, preventive procedures or those initiated as early as possible in the course of a disease are the most successful therapy. . . .

Equally invalid is the functional separation of medical care for occupational and for nonoccupational illness. What was yesterday considered nonoccupational in origin, is today proven to be caused by occupation. . . . With equal justification we can expect that many industrial processes and materials now considered to be innocuous will tomorrow prove to be serious health hazards. . . .

Management does not debate with itself the proper scope of industrial medicine; it assumes certain responsibilities for the medical care of workers because doing this is financially worthwhile. The National Association of Manufacturers, the National Industrial Conference Board, and other management groups have repeatedly emphasized that it pays management to keep workers on the job and well. As the good health of the worker, not the source of his illness, is the financially important factor, the monetary approach is equally valid for non-occupational illness. . . .

In the past, the industrial hygienist has had an important role in three of the four aspects of medical care for workers—preventive and therapeutic services for occupational injury and illness, and preventive services for nonoccupational illness. With few exceptions, the industrial hygienist has played a minor role in the fourth aspect of medical care for workers—therapeutic services for nonoccupational illness. The time is long past due for the industrial hygienist to join with the practicing physicians and all other community health resources in filling this important gap in the field of industrial hygiene.

Quoted from Lear, Walter J., and Bloomfield, J. J.: *The Industrial Hygienist and Medical Care*. U. S. Public Health Service, Division of Industrial Hygiene, 1948. (Mimeographed.)

A medical care program [for industrial workers] of any one of the variety of possible patterns would complement a preventive program and in many ways make it more effective. Case finding efforts of an industrial hygiene service in the plant and of a health department outside the plant would be assured of better follow-up. The hernia detected in a preemployment physical examination could be assured of prompt surgical correction or the diabetes discovered in a routine prenatal urinalysis could be put under prompt medical control. Likewise, in day-to-day medical service, conditions of special public

health interest might be turned up and referred to the health agency. A medical care program would, moreover, strengthen the routine industrial hygiene services in a plant, which public health is eager to advance. The very operation of a plan for medical care will heighten the interest of both management and labor in effective in-plant preventive activities, if only in the interest of economy in expenditures for treatment. Close contact between physicians in the industrial hygiene service and those rendering medical care will keep the latter conscious of the problems of occupational diseases, so often missed by isolated practitioners.

It is of some historical interest that almost the first official act of the then newly created Office of Industrial Hygiene and Sanitation of the United States Public Health Service in 1914 was to study the health of garment workers in New York City and that a principal result of this was the establishment of the first direct-service union-sponsored medical care plan in the Nation. . . . The underlying fact is that both management and labor are today inclined to spend money on health and welfare provisions. The immediate question is: How can each available dollar be spent to bring the greatest health benefit to the worker? The answer to this question will almost necessarily provide an answer to the corollary question: What type of program will provide the best labor-management relations?—for the most effective and economical program should best serve the needs of both employer and employee.

Studies might be conducted by public health agencies to determine the results of different types of industrial medical care plans in their community—results in terms of volume of health services rendered, costs, absenteeism, working efficiency, quality of care, all the factors entering into a determination of the "health value per dollar." On the basis of such studies, practical advice could be offered to both labor and management groups concerning possible modification of their present practices or the best lines along which new programs might be organized. Such counsel, after all, is given every day with respect to in-plant industrial hygiene services. It will be more eagerly sought in medical care, simply because problems in this field today are felt by unions and management to be more pressing.

Quoted from Janis, Lee, and Roemer, Milton L.: "Medical Care Plans for Industrial Workers and Their Relationship to Public Health Programs." *American Journal of Public Health*, 39:1251-1252 (September) 1948.

Characteristics of Industrial Medical Service Plans

Industrial medical service plans, now [1946] estimated to cover 1,900,000 persons, are important as pioneers, as well as for the excellent service which many of them render. The Northern Pacific Mutual Beneficial Association was formed in 1882 for employees of

the Northern Pacific Railroad, and in 1938 was rendering complete medical service and hospitalization to 16,500 employees, who contribute 1 percent of their earnings (\$9 to \$18 per year). Many plans, such as the Tennessee Coal & Iron Co. plan of Birmingham, Ala., the Stanocola plan at Baton Rouge, La., the Endicott Johnson plan at Binghamton, N. Y., and the railroad plans, have been operating for 20 years or more. They are rendering service, usually on a group practice basis with salaried physicians, and with satisfaction to employees and increased efficiency for management. Other plans, such as the Kaiser Permanente plans, were developed recently, even since the war. A few, like Stanocola, cover dependents. Service is much broader than the usual commercial insurance, and many companies bear part of the cost. The rates quoted for the Northern Pacific plan indicate company subsidy, and the Endicott Johnson plan includes dependents, and the company pays the entire cost.

Many of these plans were stimulated partly by need for service at remote places or under war-boom conditions in order to attract employees and keep them on the job. In these days of manpower shortages, employers have been glad to support medical service plans as an added incentive when wage increases were forbidden.

Quoted from Dearing, W. Palmer: "Medical Service Plans Across the Country." American Journal of Public Health, 36:771 (July) 1946.

Table 122.—Number and percent of persons eligible for specified services under industrial prepayment medical care organizations, by type of organization¹

Type of organization	Persons eligible for care	Physicians' service					Hospitalization
		At home and office; and in hospital for—		At home and office only	In hospital only		
		Medical and surgical cases	Medical cases only		Medical and surgical cases	Surgical cases only	
Number							
Total.....	1,512,148	1,313,797	5,036	59,580	7,904	57,581	1,419,699
Financed by employer.....	212,590	176,913	-----	8,282	-----	27,395	202,877
Financed jointly by employer and employee.....	546,772	502,856	400	36,373	414	6,143	483,888
Financed by employee.....	752,786	634,028	4,636	14,925	7,490	24,043	732,934
Percent							
Total.....	100	86.9	0.3	3.9	0.5	3.8	93.9
Financed by employer.....	100	83.2	-----	3.9	-----	12.9	95.4
Financed jointly by employer and employee.....	100	92.0	.1	6.7	.1	1.1	88.5
Financed by employee.....	100	84.2	.6	2.0	1.0	2.5	97.4

¹ Based on a comprehensive survey of prepayment medical care organizations made in 1945. Of the 229 plans included in the study, 50 percent were industrial plans associated with 1 particular company. Plans sponsored by unions, with benefits available to union members, were included in another classification.

² Includes some dependents eligible only for hospitalization.

Source: Klem, Margaret C.: Prepayment Medical Care Organizations, 3d ed. (Social Security Board, Bureau of Research and Statistics Memorandum No. 55). Washington, Government Printing Office, 1945, p. 17.

Table 123.—Number of persons eligible for medical care and percent eligible for special duty and visiting nurse service in industrial prepayment medical care organizations, by type of organization ¹

Type of organization	Number of persons eligible for medical care	Percent eligible for special duty or visiting nurse service			
		Total	Special duty only	Visiting nurse only	Both special duty and visiting nurse
Financed by employer.....	212, 590	45. 6	4. 3	17. 8	23. 5
Financed jointly by employer and employee.....	546, 772	77. 9	45. 0	32. 9	-----
Financed by employee.....	752, 786	76. 7	60. 8	14. 0	11. 9

¹ Based on a comprehensive survey of prepayment medical care organizations made in 1945. Of the 229 plans included in the study, 50 percent were industrial plans associated with 1 particular company. Plans sponsored by unions, with benefits available to union members, were included in another classification.

Source: Klem, Margaret C.: Prepayment Medical Care Organizations, 3d ed. (Bureau of Research and Statistics Memorandum No. 55). Washington, Government Printing Office, 1945, p. 19.

Table 124.—Number of persons eligible for medical care and percent eligible for specified type of dental service, in industrial prepayment medical care organizations, by type of organization ¹

Type of organization	Number of persons eligible for medical care	Percent eligible for specified dental service							
		Diagnostic X-ray		Extractions		Prophylaxis		Fillings	
		Pre-payment	Re-duced fee	Pre-payment	Re-duced fee	Pre-payment	Re-duced fee	Pre-payment	Re-duced fee
Financed by employer....	212, 590	7. 8	2. 9	27. 5	2. 9	27. 5	2. 9	23. 5	2. 9
Financed jointly by employer and employee.....	546, 772	45. 2	25. 8	27. 2	30. 0	7. 4	26. 1	7. 4	26. 1
Financed by employee.....	752, 786	32. 9	3. 6	13. 5	. 2	6. 4	. 2	6. 3	. 2

¹ Based on a comprehensive survey of prepayment medical care organizations made in 1945. Of the 229 plans included in the study, 50 percent were industrial plans associated with 1 particular company. Plans sponsored by unions, with benefits available to union members, were included in another classification.

Source: Klem, Margaret C.: Prepayment Medical Care Organizations, 3d ed. (Bureau of Research and Statistics Memorandum No. 55). Washington, Government Printing Office, 1945, p. 18.

Table 125.—Number of physicians and nurses associated with industrial prepayment medical care organizations, by type of organization ¹

Type of organization	Number of organizations	Physicians and nurses associated with the organizations			
		Physicians			Full-time registered professional nurses
		Full time	Part time	Participating	
Total.....	115	472	6, 089	134	1, 336
Financed by employer.....	19	33	. 59	-----	119
Financed jointly by employer and employee.....	47	177	1, 642	96	412
Financed by employee.....	49	262	4, 388	38	805

¹ Based on a comprehensive survey of prepayment medical care organizations made in 1945. Of the 229 plans included in the study, 50 percent were industrial plans associated with 1 particular company. Plans sponsored by unions, with benefits available to union members, were included in another classification.

Source: Klem, Margaret C.: Prepayment Medical Care Organizations, 3d ed. (Bureau Memorandum No. 55). Washington, Government Printing Office, 1945, p. 20.

Prepayment Industrial Dental Care Plans

American Cast Iron Pipe Co.

This industry has a medical care plan financed by the employer. About 2,000 employees and their dependents, or a total of 8,000 persons, were eligible in 1944 for relatively complete medical care, including physicians' care in the clinic, home, and hospital, hospitalization and comprehensive dental care. The employees are about equally divided between white and Negro, but the Negroes have a larger proportion of the dependents.

Dental service is provided by two part-time dentists and a full-time dental hygienist. During each of the past 4 years, the dentists have been on duty a total of about 2,350 hours—the equivalent of approximately one dentist working full time and one working about half time.

In a few instances, dental care is ordered by a physician, but generally the service provided results from the direct request of the workers or their dependents. There is a marked difference in the amount of service provided to whites and Negroes. . . .

Number of dental services received per 1,000 eligible persons, 1941-44

Services	1941		1942		1943		1944	
	White	Negro	White	Negro	White	Negro	White	Negro
Bridgework.....	36.9	38.2	43.2	17.2	23.6	1.8	6.7	2.7
Cleaning.....	103.1	22.8	217.2	81.6	194.5	48.0	132.3	25.3
Crowns.....	7.7	20.9	10.4	4.0	4.0	.4	2.3	.3
Dentures.....	83.7	25.5	114.0	30.8	65.8	1.8	52.0	5.7
Examinations.....	51.4	33.8	90.0	26.8	19.3	9.1	9.3	4.0
Extractions.....	178.2	164.6	245.2	148.0	217.8	83.3	206.3	83.0
Fillings.....	342.5	52.0	569.6	144.0	625.8	196.4	592.3	118.0
Gum treatments.....	192.0	95.4	217.2	106.8	205.1	85.1	154.0	46.0
Miscellaneous.....	149.2	67.1	260.0	125.6	208.7	140.4	151.7	74.0

All dental services are provided without cost, with two exceptions—any gold that is used and the materials used in making dentures must be paid for by the patient. During the 4-year period for which data are available, the charges made to patients for such items have been very small. . . .

Consolidated Edison Employees' Mutual Aid Society, Inc.

Dental care in this organization is offered as part of the medical services available to employees of an industrial company. Medical care as now provided is rather comprehensive and is an outgrowth of the company's 40 years of efforts on behalf of its employees. The plan is supported by equal contributions from employer and employe and, although voluntary, has 99 percent subscriber membership among eligible workers. In 1943, 21,800 persons were eligible for care, 18,700 men and 3,100 women; in 1944, 20,700 were eligible, 17,850 men and 2,850 women.

The plan includes the following dental services: Prophylaxis; roentgenograms; dentures and denture repair; silver, porcelain, cement, alloy, and amalgam fillings; and extractions, except for impacted molars and those requiring surgery. Complete dentures are supplied to members after at least 2 years' membership in the society. . . .

Dental care is provided by dentists who are employed on an hourly basis and work in their own offices—45 dentists in 1943 and 38 in 1944. Both their work and their offices are inspected periodically by the association's dental consultant and one of the assistant medical directors. In addition to a \$5 hourly rate, the dentists receive payments for roentgenograms—\$0.75 for single roentgenograms, \$1.50, for half mouth, \$3 for full mouth. They are reimbursed for the actual cost of certain types of dentures. The maximum payment for full dentures made of vulcanite rubber is \$12.50 each. The cost of partial dentures varies but usually does not exceed \$22 each. In 1944, a total of 15,350 hours were spent by dentists in carrying out the program—a decrease of 2,250 hours from the preceding year. . . .

The annual cost of dental service provided by this organization per person eligible for care was \$5.35 in 1943 and \$4.89 in 1944. . . .

Macy Mutual Aid Association

Dental care in this organization was available in 1943 to approximately 10,000 employees and to 7,450 in 1944; it is included in the benefits provided by the association, which is financed by employer and employees. Dental consultations and emergency treatments are given without charge. All types of permanent dental work are done on a reduced-fee basis. In 1943, the dental clinic gave a total of 6,963 services, while in 1944 the volume of services increased by 340.

During 1943, 3,598 patients received emergency treatments, while 1,568 had permanent work done. In 1944, there was a decided increase in the number of patients receiving these services; 4,771 emergency visits were made to the clinic and 2,204 patients had permanent work done. . . .

Number of dental services provided to each 1,000 persons eligible for care, 1943 and 1944

Services	1943	1944	Services	1943	1944
Cleaning	173.7	200.0	Treatments:		
Extractions	43.3	69.1	Gum	26.3	34.5
Fillings:			Postoperative	33.3	49.8
Cement	12.5	13.0	Root canal	32.4	51.8
Porcelain	81.5	102.7	Miscellaneous	41.3	135.4
Silver	236.5	297.0			
Gold inlays	8.8	12.5			
Repairs, type unknown	6.7	14.2			

All benefits and expenses are paid from a fund to which each employee contributes 1 percent of his weekly salary but not more than 60 cents a week, and to which the company contributes an amount equal to all dues collected monthly.

Dental care is given at the association's dental clinic, which, in 1944, was staffed by four part-time dentists, one full-time hygienist and two office assistants. During that year, 2,300 hours were spent on the program by dentists and 6,240 by two hygienists.

In addition to giving consultations and emergency care without charge, the clinic emphasizes the importance of regular cleaning of teeth by a hygienist. This service is done at a nominal charge (\$1 to \$1.50). . . .

Charges for permanent dental work are based on a fee schedule and vary in accordance with the employee's earnings. . . . Information is not available on the total cost of providing the service. In 1943, the salaries of the four part-time dentists, two full-time hygienists and one full-time secretary amounted to \$12,280. In 1944, in addition to the four part-time dentists, the dental staff consisted of one dental hygienist and two office assistants, whose combined salaries amounted to \$11,023. Supplies cost \$1,520 in 1943 and \$1,572 in 1944. Depreciation of equipment was reported as approximately \$275 in both years. In 1944, 1,929 dental roentgenograms resulted in an income of \$505, as compared with a net income of \$313.50 from roentgenograms in 1943.

Medical Care Plan, Jack and Heintz, Inc.

This organization has a relatively complete medical care plan, including dentistry, the entire cost of which is paid by the company. The company employs four dentists, four dental assistants and one receptionist on a full-time basis for the dental department. Approximately 8,700 employees were eligible for care in 1944. . . . A total of 27,000 services were provided. . . .

Number of services provided to each 1,000 persons eligible for care, 1944

Dentures, repairs and relines.....	2.8	Treatments:	
Diagnosis and consultation.....	660.9	Gum.....	85.4
Diagnosis, microscopic.....	6.2	Postoperative.....	174.4
Examinations.....	618.5	Prophylaxis.....	237.1
Extractions.....	382.5	Vincent's infection.....	78.9
Fillings:		X-rays:	
Alloy, 1 surface.....	6.9	Full mouth.....	473.2
Alloy, 2 or 3 surfaces.....	6.7	Bitewings.....	37.9
Synthetic or cement.....	11.7	Single.....	135.2
Temporary.....	40.2	Miscellaneous.....	35.3
Recementing inlays and crowns and adjusting dentures.....	68.4		

Stix, Baer, & Fuller Employees' Mutual Aid Association

This is an industrial plan financed jointly by employer and employees. It provides medical care in the clinic, home, and hospital, but limits the annual amount provided for any one employee to \$150, including cash disability benefits. In dentistry, one part-time dentist provides

prophylaxis, fillings, extractions, treatments, and emergency care.

All but 400 of the 2,500 employees eligible for care received some type of dental service. A slightly higher percentage of male than of female employees received dental care of some type. Persons in the age group of 45 to 64 years used the dental service most extensively.

Except for emergency care, prophylaxis was the service given most frequently. . . . Twice as many men as women had extractions, about 13 percent of the men as compared with 7 percent of the women. . . . About 20 percent of the men and women had fillings during the year. . . . Treatments and emergency dental care were received by approximately one-third of the eligible membership.

The organization reports that it is difficult to give an accurate figure on the cost of providing dental care, inasmuch as the administrative and clerical cost, maintenance costs, and the cost of equipment cannot be separated from hospital costs. The costs of dental supplies and the dentist's salary, with a minimum allowance for the time of the receptionists and a clerk typist, amounted to \$3,000, an average cost of about \$1.50 per year for eligible persons.

Westchester Lighting Co. Employees' Mutual Aid Society

In addition to a rather complete medical care plan, this organization offers its members comprehensive dental care. In June 1945, the 1,933 eligible employees (1,567 men and 366 women) were entitled to the following dental services: Prophylaxis, treatments, extractions, fillings, roentgenograms, inlays, crowns, partial and full dentures, and repairs to dentures. The plan is jointly financed by the employees and the employer through a mutual aid society and is administered by a board of managers, elected annually by the employees.

The staff of 14 dentists is paid by the society for the amount of work performed for employees in accordance with an established allowance schedule. On completion of the work, the dentist fills out a form supplied by the society on which he indicates the amount and the type of service rendered and sends it to the society for payment. The amount allowed generally is sufficient to cover the cost of ordinary procedures. . . .

One of the unusual features of this plan is the use of the family dentist. A member, if he prefers, may be treated by his family dentist, rather than by one of the staff dentists. The same allowances are made for work done by the family dentist as for work done by the staff dentists. If the charges of the family dentist exceed the allowance, the member pays the dentist the difference.

Available data show that 1,375 members were treated in 1943 at a cost of \$15,255.25—an average of \$11.09 per member treated, while in 1944, 1,219 persons received care at an average cost of \$10.50 per member treated. The average cost of care per member eligible was \$7.50 in 1943 and \$6.63 in 1944. The dental hygienist in the dental

clinic operated by the company gave 771 prophylactic treatments in 1944. . . . The work of the dental hygienist, under the supervision of a dentist, consists of prophylactic treatments, examining teeth, and recording the findings on a dental form which the employee gives the dentist and maintaining a record of all service rendered to each employee. . . .

Quoted from Klem, Margaret C.: "Medical and Dental Care in Prepayment Medical Care Organizations." *The Journal of the American Dental Association*, 33:342-348 (March) 1946.

Corning Glass Works

The dental clinic of the Corning Glass Works was established in 1925, with one unit (chair, CDX, and tridental unit). The services of a full-time dentist were obtained and an educational system was established under his supervision to acquaint the employees with the program. A follow-up system on dental care of each employee was introduced, in which the employee's foreman was notified every 6 months of the need for an examination of the employee. The program consisted of prophylaxis, treatment, diagnosis, X-rays, extractions, and miscellaneous work, such as recementing inlays, crowns, adjusting plates, etc. This work was done with no cost to the employee, the company bearing all expense, including the salary of the dentist.

In 1937, with the completion of a new personnel building and subsequent enlargement of all medical facilities, additional dental equipment was purchased to allow furnishing of two complete dental operating rooms by utilizing the older equipment. This new equipment consisted of a chair, operating units, instrument cabinets, and a new X-ray machine. X-ray processing facilities are shared with the medical staff technician.

The service is still operated in conjunction with the medical staff, and frequent consultation with them increases the effectiveness of the program. The services of four trained nurses from the staff are available for assistance in operating.

The Evening Star

The very complete dental clinic of the Evening Star, Washington, D. C., has an interesting history. It was established in 1922. In the first year a dentist was employed for half a day, 6 days a week, and gave diagnostic and X-ray services, referring employees who needed treatment to their own dentists. It was found difficult at first to interest the employees in visiting the clinic, and a clerk was employed to assist the dentist and to help in promoting the idea. Later a full-time dental hygienist was employed to do prophylactic and clerical work.

After the clinic had been in operation for a year or two, it was found that under this system no treatment for the mouth conditions found was being secured by the great majority of the employees. On investigation, many stated that when they had gone to their dentists

they had received cost estimates which, to them, seemed staggering in amount and that they felt they could not incur this expense.

As a result the clinic was expanded. A dentist and hygienist were employed full time with two fully equipped chairs. An X-ray machine and a small laboratory were provided. Treatments are now offered to all employees and their dependents at a low schedule of charges ranging from 50 cents for simple fillings or extractions to \$25 for elaborate dentures. Diagnostic, X-ray, and prophylactic work, including treatment for pyorrhea and other mouth infections, is still done for employees without charge, and for dependents at a nominal charge of around \$2.

This company feels that the employee places a higher value on services for which he has to pay something. In fact, although the clinic was at first equipped at the expense of the company, the actual operating expenses, including salaries and supplies, have been furnished by the employees' benefit fund. The fund is credited with the amount of the dental charges, which are deducted from the employees' pay envelopes in one sum or in installments . . . The net operating cost of the clinic, excluding overhead, has averaged about \$5,000 annually in recent years.

Quoted from Metropolitan Life Insurance Co., Industrial Health Section: Industrial Dental Service, New York, The Company (Undated), pages 27, 29, 31.

Nursing Services in Prepayment Medical Care Plans

Two of the organizations, which cooperated in the study of prepayment medical care organizations, provided further details on nursing care in addition to those presented in Prepayment Medical Care Organizations, [Social Security Board, Bureau of Research and Statistics Memorandum No. 55] and in the literature of the organizations. The medical department of the American Cast Iron Pipe Co. of Birmingham, Ala., provides relatively complete medical care, the entire cost of which is paid for by the company. The workers and their dependents are eligible to receive physician's care in the clinic, home, and hospital; hospitalization; and dental care. In this organization, 8 registered graduate nurses were employed to serve a total of 8,000 persons and, of this number, 2 devoted full time to visiting nursing service. The visiting nurses assist the doctors with home deliveries, instruct mothers in care of their babies, change surgical dressings, and give other treatment prescribed by the doctors. Negroes represent about half the total membership in this plan and, during 1943, the visits made to the homes of Negro employees numbered 1,575, and those to the homes of white employees, 1,605.

These visits include some made in connection with work of the personnel office. Many visits are made to the homes of workers who appear to be having difficulties at home. The company has found that

an employee cannot do his best work when he is worried about the illness of his wife or child and feels that he should be home taking care of them. When the employee knows that the nurse will call at his home each day to see that everything is being done for the patients, his work suffers far less.

This medical organization also makes arrangements for private duty nursing if the doctor thinks it necessary and permits the employee to repay the cost of such service through payroll deduction. Dr. C. B. Bray, the medical director, writes that—

“This procedure enables our employees to have the care of a special nurse without having to pay the entire cost at one time. The total amount paid to special nurses for the year 1943 was \$7,094.25, with a total of approximately 80 patients being served.”

The Employees' Mutual Benefit Association of the Milwaukee Public Service Companies has a large medical department which also provides relatively complete care, that is physician's care in the office, home, and hospital; surgery; maternity care; dental care; and hospitalization. The cost of the medical department is shared equally by the employer and the employees.

This organization employs five registered graduate nurses and emphasizes the value of their home visits. In addition to the usual calls for prenatal and postnatal cases the visiting nurse makes home visits to change surgical dressings, to instruct patients in the preparation of certain diets, and to follow up on difficult cases in which there is a possibility that the patient may not be following instructions. The medical director says that the extensive use of visiting nurses improves the service by saving the patient many trips to the clinic and relieving the doctor of certain work that he believes the nurse can do as well or better. In this organization, in which 18,000 persons in a prewar year were eligible for medical care, the average cost of the nursing service amounted to approximately 65 cents per year per person eligible. Dr. Ernest W. Miller, the medical director of this plan, believes that a large share of the success of the medical department is due to the excellent work done by the visiting nurses.

Quoted from Klem, Margaret C.: "Is Prepaid Nursing Care Possible?" *American Journal of Nursing*, 44:1159-1160 (December), 1944.

The Blue Cross plans, the outstanding type of service plans providing for hospitalization with certain restrictions, always include general nursing in the hospital in their basic benefits but ordinarily exclude other types of nursing service. The comprehensive prepayment plans sponsored by medical societies in Oregon and Washington cover general nursing in the hospital and in a number of instances also special nursing in the hospital. In contrast, the medical-society-sponsored service plans in other parts of the country offer no nursing service at all, as they are limited to certain services of physicians, usually surgical services in the hospital.

The group-practice prepayment plans, which operate from medical centers and render service by a smaller or larger number of physicians and other members of the health professions working together in systematic association, usually have substantial numbers of professional and practical nurses on their clinic staffs for service to ambulatory patients and, with some exceptions, cover general nursing in the hospital. A few organizations also provide for visiting nurse service, although with limitations. An example of large-scale utilization of nurses for clinic service under a voluntary medical care insurance plan is the Ross-Loos Medical Group in Los Angeles, Calif. At the end of 1946, the staff of this organization, totaling 338 persons, included 98 full-time physicians and 118 registered nurses. . . .

The policies adopted by the various types of medical care insurance plans in the past were dictated by uncertainty about the effective demand for comprehensive nursing service under prepayment arrangements, the probable costs of such service under various methods of payment for nursing care, and the personnel needed for adequate nursing of the individual in health and sickness.

It was only very recently that some information on these questions was gained. Our present knowledge is derived from the experience of a few group-practice prepayment plans and therefore does not lend itself to sweeping conclusions about nursing service under voluntary medical care insurance plans operating on the basis of the individual practice of medicine and the fee-for-service method of payment to physicians. According to these observations it may be assumed that approximately 6 to 7 nurses per 10,000 persons eligible for service by group-practice prepayment plans are required to serve patients coming to the clinic or medical center for advice, diagnosis, or treatment; and that anywhere from less than 10 percent to about 20 percent of all participants need and demand visiting nurse service. The higher figure might be experienced if the eligible persons include many old people and young children, live in comfortable homes, and are fully aware of the advantages of visiting nurse service. The demand might remain far below the 10-percent figure if the housing conditions of the majority of the subscribers are unfavorable, restrictions are imposed on the amount of visiting nurse service, and the physicians affiliated with the plan pay but scant attention to this type of care.

Quoted from Goldmann, Franz: "Nursing in Health Insurance Plans." *Public Health Nursing* 40: 406 (August) 1948.

No one realizes better than I that medical care is not complete without nursing care. I should welcome any practicable suggestion for its inclusion in the services offered by voluntary nonprofit prepayment plans. But also I realize that its cost, on the usual terms of private duty nursing, is completely prohibitive. . . .

The only practicable solution that I can think of is the use of visiting nurses, to spread the cost over a number of patients. But the admin-

istrative arrangements necessary to such a plan are far from simple. In the first place, I doubt whether any Blue Cross or Blue Shield plan would entertain the idea of employing visiting nurses on a straight salary basis. The overhead required for their control, and the fluctuations in the demand for them, would make their services too costly. I think that, at least as a beginning, the problem should be approached on the basis of fee-for-service, just as participating physicians are paid through Blue Shield plans. The calculation of the actuarial risk would be relatively simple with such an arrangement. Contracts could be entered into between medical care plans and visiting nurse associations upon the basis of a fee for a visit similar to the agreements between participating physicians and the medical care plans.

Quoted from Hawley, Paul R.: "Nursing in a Program of Prepaid Medical Care." *The American Journal of Nursing*, 48: 484 (August) 1948.

Health and Welfare Benefits Under Collective Bargaining

If Samuel Gompers were alive today, he would probably smile wryly whenever the subject of union-management plans was mentioned. For almost 40 years, as president and official spokesman of the American Federation of Labor, Gompers preached against compulsory social insurance and pleaded with the unions in the Federation to establish their own benefit systems. The result of his efforts was a hindering of the development of an American social security program and only a slight ineffectual development of union benefit systems.

During the 1920's, industry, with Gompers' tacit approval, attempted to fill this gap by sponsoring employer welfare programs. The Federation thought it had found the answer in union sponsored life insurance companies. The great depression of the 1930's, however, demonstrated to both employers and the unions the inadequacy of their respective approaches.

Quoted from Rosenthal, Robert: "Union-Management Welfare Plans." *Quarterly Journal of Economics*, 62:64-65 (November) 1947.

Records indicate that the first collective bargaining agreement to provide for nonoccupational sickness and accident benefits was negotiated as early as 1926, but the new trend did not emerge clearly before World War II. During the war the wage stabilization policies of the War Labor Board effectively restricted union bargaining for simple across-the-board wage increases even when employers were ready to grant them. Most health insurance plans negotiated during the war were the result of efforts to discover benefits in lieu of wages which the War Labor Board would approve and which would have an obvious value for workers in dollars and cents and in improved morale. Paid vacations and paid holidays were the most popular

of these wage-substitute demands. These were widely established by the end of the war in union-management contracts. Health insurance was never as common an item in negotiations. The Board never seriously considered disapproving these insurance arrangements, when agreed to by both parties, but it did not order their inclusion in contracts in disputed cases.

Consequently, during the war the Government made no official determination of the status of health insurance among collective bargaining demands. The question arose again under the Labor Management Relations Act, 1947. In the early fall of 1948 a United States Circuit Court of Appeals upheld a National Labor Relations Board ruling requiring an employer to bargain on pension plans. The court held that the terms "wages" and "other conditions of employment" as used in the collective bargaining provisions of the act clearly include pension and retirement funds. The National Labor Relations Board, in another case, ruled that group health insurance plans also fall within the meaning of these terms. . . .

Quoted from Brumm, John M.: "Health Programs in Collective Bargaining." University of Illinois Bulletin, 46:5 (February) 1949.

More than 3,000,000 workers—over twice the number in early 1947—were covered by some type of health, welfare, and/or retirement benefit plan under collective bargaining agreements by mid-1948. This coverage includes benefit plans negotiated as a part of labor-management agreements, and those originally established by employers and later incorporated into an agreement. . . .

About 45 percent of the 3,000,000 workers included under some type of employee-benefit plan, it is estimated, are covered by plans which provide health and welfare benefits, except retirement. Such plans include one or more of the following benefits: Sickness or accident, hospitalization, surgical, maternity, medical care (services or cash), accidental death or dismemberment, welfare assistance, life insurance, and death. About 44 percent are covered by plans which provide one or more of these specific benefits, as well as pensions, and about 11 percent are covered solely by retirement or pension provisions. . . .

Large numbers of workers in the following industries are covered by some type of health, welfare, and/or retirement benefit plan under collective bargaining: Coal mining, clothing (men's and women's), textiles and hosiery, millinery, building trades, machinery (particularly electrical), rubber, office and professional workers, paper, furniture, shipbuilding, steel, utilities, retail and wholesale trade, local transportation, fur and leather, cleaning and dyeing, hotel and restaurant, telephone and telegraph, playthings, and jewelry.

Quoted from Department of Labor, Bureau of Labor Statistics: Employee Benefit Plans Under Collective Bargaining (Bull. No. 946). Washington, Government Printing Office, 1948, pages 1-3.

In lieu of wage increases, present trends in labor-management negotiations emphasize welfare benefits, many of which involve the medical profession to a greater or lesser degree. Certainly the physician in industry will find his sphere of action and influence considerably broadened. It is doubtful that the medical interest involved is clearly realized, even by the profession itself. Two projects are expected to define the nature of and demand for medical participation in industrial welfare programs. The Council on Medical Service [of the American Medical Association] has appointed a committee to investigate over-all medical services for industrial workers and has invited the Council on Industrial Health to nominate members to this committee. In addition, it will consider cash sickness insurance with its attendant problems of certifying the nature and probable duration of nonoccupational illness or injury. The Council on Industrial Health, the Board of Trustees and the House of Delegates all have approved the general policy of cooperative industrial health planning by management, labor, and medicine, provided scientific and ethical standards are maintained. It is the Council's belief that this passive approval should be changed to active insistence. At all events, a definite policy is urgently needed.

Quoted from American Medical Association, Council on Industrial Health: "Report." Journal of the American Medical Association, 141:679 (Nov. 5) 1949.

Those health, welfare, and retirement plans assured through collective bargaining contracts follow no particular pattern. They vary as to methods of financing and insuring. Likewise, there are differences in administration, benefits, eligibility criteria, and other details. When classified according to the means used in financing, funds may be grouped according to whether moneys are derived from (1) the employer, or (2) joint contribution. Administration may be vested in (1) the employer, (2) the union, or (3) a union-management group

In addition, plans may be insured by (1) an established private carrier, (2) an insurance company chartered for the express purpose of insuring a particular plan, or (3) benefits may be paid directly from the fund. Where insurance is with an established private company, the company in many instances has a role in the administration of the plan. . . .

Quoted from United States Congress, Joint Committee on Labor-Management Relations: Labor-Management Relations: Welfare Funds (Report 986, 80th Cong.). Washington, Government Printing Office, 1948, part 4, page 4.

Social insurance and pensions should be considered a part of normal business costs to take care of temporary and permanent depreciation in the human "machine," in much the same way as provision is made for depreciation and insurance of plant and machinery. This obligation should be among the first charges on revenues. . . .

The concept of providing social insurance and pensions for workers in industry has become an accepted part of modern American thinking. Unless Government provides such insurance in adequate amount, industry should step in to fill the gap. . . .

Quoted from The Steel Industry Board: "Findings and Recommendations." Report to the President of the United States on the Labor Dispute in the Basic Steel Industry. Washington, Government Printing Office, 1949, pages 8-9.

What Is the Future of Employee Benefit Plans?

The various alternatives in answer to this question are: (1) They may become so universal as to provide a system of adequate protection against those economic hazards not now covered by social insurance; (2) their coverage may be entirely upon a selective basis, employed only where actual needs and resources of the workers justify; (3) they may be supplementary to social insurance, with the latter providing the minimum floors of protection. . . .

There are two chief avenues of expansion: (1) Through the establishment of additional plans by firms, and (2) increased coverage under existing programs since about 20 percent of employees in firms with plans are not covered either because of disinclination to join or because of ineligibility.

How Can Group Plans Be Provided for the Employees of Small Establishments?

Our surveys show a much smaller coverage of workers in firms with less than 100 employees, and a very low percentage in the case of those with less than 25. This is due in part to lack of consciousness of need and in part to inability to qualify for a group plan. There are several proposed arrangements by which these obstacles may be overcome.

Can Coverage Under Employee Benefit Plans Be Coordinated With a Wholesome Degree of Mobility of Labor?

Under present systems, if a worker changes employment, he must change employee benefit plans, losing some potential benefits, and may be ineligible for a plan at his new place of employment until the lapse of a probationary period. Thus, coverage in such programs may tend to tie the employee to his present position. If mobility is to be preserved, arrangements should be made to transfer the protection against hazards when the worker changes jobs.

Where Should the Cost of Employee Benefit Plans Be Placed, Upon Employer or Upon Employee?

There is a great variety of practice among present plans. It is easy to arrange for the immediate payer, but there are fundamental questions as to where the final incidence of cost

comes to rest. Which party should bear the cost is also bound up with the type of benefit and the sense of responsibility for successful operation of the plan.

Can Employee Benefit Plans Be Arranged Properly Through Collective Bargaining?

If the benefits provided are considered as a variety of wages or conditions of work, then they will be regarded as subjects for bargaining. In such case there may be some untoward eventualities if such benefits become a football in wage negotiations. Many of the forms of protection carried under employee benefit plans are of such character as to call for an assured status both in amounts and in permanence. This may mean that, as the bargaining powers of labor and management change, so may the fate of benefit plans, running high at one time and being abolished at another.

How Heavy a Structure of Benefits Can the Economic Organization Support?

The benefits under employee benefit plans may be somewhat similar to social insurance in this respect. A high level of benefits may increase purchasing power and consumption goods. This may divert from investment and adequate provision of capital goods. What is needed is a proper quantitative relation of benefits to production from which all such outlays must come eventually.

Quoted from Strow, Carl W.: "Employee Benefit Plans in Six Midwest Metropolitan Areas." *American Economic Security*, 6: 25-26 (July-August) 1949.

The unions seeking sickness insurance or broader social security clauses in their current collective bargaining are also those supporting the efforts to secure health insurance through Federal or State legislation. Both the American Federation of Labor and the Congress of Industrial Organizations have repeatedly urged the passage of such Federal legislation. . . .

Union leaders, it appears, are not interested in developing private group sickness insurance in order to avoid public health insurance. Rather they are seeking private insurance as a means of gaining some protection until the wider protection of the Wagner-Murray-Dingell bill is assured, or as an employer contribution to workers' security which later may be continued as a supplement to public health insurance. . . .

Whatever the future of health and accident insurance now incorporated in many labor agreements, the development is of current value and interest as an important social experiment. Just as private unemployment benefit plans were useful forerunners to compulsory unemployment insurance, so the present sickness insurance plans may help to test the ability of industry to provide this protection for its

employees and to determine the need for more comprehensive plans to meet the costs of sickness and the problems of medical care. Moreover, the wide variety of plans established through collective bargaining will, if they continue for even a few years, provide experience to employers, trade unions, and the public, that will be suggestive in the development of compulsory insurance. In the meantime, the benefits afforded through the existing plans give real help to a considerable group of industrial workers.

Quoted from Baker, Helen, and Dahl, Dorothy: *Group Health and Sickness Benefit Plans in Collective Bargaining*. Princeton, N. J.: Princeton University, Industrial Relations Section, 1945, pages 80, 81, 89.

Some type of nonoccupational sickness or accident benefit clause was incorporated in 3 out of every 10 collective bargaining agreements recently analyzed by the United States Department of Labor's Bureau of Labor Statistics. Under provisions of about 80 percent of these, employers agreed to bear the entire cost of such benefits.

Data as to prevalence and provisions of sick leave and accident benefit clauses were derived from a study of 2,148 labor-management agreements covering more than 3½ million workers during 1949. These agreements were widely distributed throughout the United States. About 48 percent were negotiated by AFL unions; 39 percent by CIO unions; and 12 percent by unaffiliated or independent unions. Firms engaged in manufacturing were covered by 1,595 contracts and 553 contracts involved nonmanufacturing firms. Agreements of manufacturing firms were distributed among 18 major industry groups; agreements of nonmanufacturing firms, among 8 groups. . . .

Of the 2,148 agreements analyzed, 678 provided benefits to employees temporarily unable to continue work because of sickness or accident incurred while not on the job. In 408 agreements, benefits were provided through group insurance plans. . . .

Of the 678 agreements with sickness and accident disability provisions, 490 contained details concerning the amount of each benefit payment to which eligible employees were entitled. In 153 of these all employees covered (except women who—in 12 agreements—received smaller payments than men) were eligible for payments of the same amount regardless of difference in individual wage rates or earnings. In these 153 agreements, employee benefits were covered by group insurance. Weekly payments ranged from \$6 to \$30. The bulk of these agreements—more than 75 percent—provided payments falling between \$10 and \$20 per week. . . .

In 337 of the 490 agreements, individual benefit payments were based on pay rates or weekly earnings. In 258 of these, the amount of single payments was expressed only by reference to earnings . . . The remaining 79 agreements provided group insurance plans and stipulated maximum benefits ranging from \$14 to \$40 per payment. Of

these 79 agreements, 85 percent provided maximum benefits of \$20 to \$40. . . .

Under 286 agreements, length of service was not a factor in determining the maximum number of weekly payments to which eligible employees were entitled . . . In these a uniform number of payments was allowed for each employee covered. The greatest number of agreements within the group stipulated 13 weekly payments as the maximum to which an employee was entitled. Some contracts (115) limited the number of weekly benefit payments for each separate disability but did not limit the total number of payments which an employee may receive in any one year. . . .

Other agreements (118) limited the total number of payments which an employee may receive in 1 year. The remaining 53 specified a maximum length of disability period but were not clear as to whether this maximum applied to any one disability or any one year.

In 130 agreements, the number of weekly benefit payments permitted was related to the length of the employee's service. All but 30 of these agreements established limits on the number of payments permissible. Some agreements allowed as a maximum a specified number of weeks at full pay and an additional number of weeks at half pay . . . Information concerning the number of payments granted was not available in the remaining 262 agreements providing sickness and accident benefits. . . .

A waiting period between the beginning of disability and the start of benefit payments was specified by 264 agreements. . . . One week was the waiting period most commonly specified, 188 of the agreements having this provision. A waiting period of only 1 day was required by 14 agreements, 2 days by 25, 3 days by 33, and 4 days by 1 agreement. The longest waiting period was 2 weeks, specified by three agreements.

Of the 264 agreements, 99 waived the waiting period requirement if an accident caused the disability. . . . Paid maternity leave was specified in 114 agreements. Most of these—97 agreements—limited the length of the benefit period to 6 weeks. Of the remaining agreements, 4 weeks' paid maternity leave was allowed by 13 agreements, 13 weeks by 3, and 3 weeks by 1. . . .

Sickness benefits were not allowed under the terms of 92 agreements, if the disability was due to such causes as alcoholism, drug use, venereal disease, or self-inflicted injuries. . . . Medical evidence of disability, such as a certificate from the employee's physician, or an examination by the company physician, was required by 197 agreements.

Quoted from Rubenstein, Irving, and Wolk, Dena: "Sickness and Accident Benefits in Union Agreements, 1949." *Monthly Labor Review*, 70:636-639 (June) 1950.

Table 123.—Number of national and international unions, by affiliation and size of membership, December 1949 ¹

Number of members	Affiliated with AFL	Affiliated with CIO ²	Independent	Total	
				Number	Percent
Total.....	107	39	61	207	100.0
Under 1,000.....	10	—	12	22	10.6
1,000 and under 5,000.....	12	1	18	31	15.0
5,000 and under 10,000.....	7	4	11	22	10.6
10,000 and under 25,000.....	17	4	5	26	12.6
25,000 and under 50,000.....	18	9	8	35	17.0
50,000 and under 100,000.....	21	13	2	36	17.4
100,000 and under 200,000.....	13	2	1	16	7.7
200,000 and under 300,000.....	3	2	2	7	3.4
300,000 and under 400,000.....	1	2	—	3	1.4
400,000 and under 500,000.....	3	—	—	3	1.4
500,000 and over.....	2	2	2	6	2.9

¹ Although exact membership data are not available for all unions listed in this directory, sufficient information is available to place all but 2 independent unions within the groups in this table.

² Includes the following unions expelled by the CIO executive board: the International Union of Mine, Mill and Smelter Workers, effective Feb. 15, 1950; the Food, Tobacco, Agricultural and Allied Workers Union of America, the United Office and Professional Workers of America, and the United Public Workers of America, effective Mar. 1, 1950; the American Communications Association and the International Fur and Leather Workers' Union of U. S. and Canada, effective June 15, 1950. Also includes the International Fishermen and Allied Workers of America which merged with the International Longshoremen's and Warehousemen's Union on May 25, 1950.

Source: Department of Labor, Bureau of Labor Statistics: Directory of Labor Unions in the United States, 1950. (Bull. No. 980.) Washington, Government Printing Office, 1950, p. 3.

Table 129.—The 5 largest AFL, CIO, and independent unions, 1949 ¹

Name of union	Membership reported ²
AFL:	
International Brotherhood of Teamsters, Chauffeurs, Warehousemen & Helpers.....	1,103,000
United Brotherhood of Carpenters and Joiners of America.....	735,000
International Brotherhood of Electrical Workers.....	450,000
International Ladies' Garment Workers' Union.....	423,010
Hotel & Restaurant Employees & Bartenders International Union.....	400,000
CIO:	
United Steelworkers of America.....	960,738
United Automobile, Aircraft & Agricultural Implement Workers.....	947,598
Amalgamated Clothing Workers of America.....	375,000
Textile Workers Union of America.....	373,770
Communications Workers of America.....	240,000
Independent (unaffiliated):	
United Mine Workers of America.....	600,000
International Association of Machinists.....	581,938
Brotherhood of Railroad Trainmen.....	210,624
Brotherhood of Locomotive Firemen & Enginemen.....	102,932
National Federation of Federal Employees.....	93,000

¹ Based on membership claims in the autumn of 1949. Information was obtained by questionnaires sent to national and international unions by the Department of Labor.

² Unions vary in their definition of membership. Some include as "members" only employed workers whose dues are not in arrears for more than a specified period. Other unions include members who are retired or inactive, temporarily unemployed, or in the armed services. In some instances apprentices are included. Some unions measure their size in terms of all workers covered by their collective bargaining agreements, irrespective of how many workers actually pay dues to the union. . . . An estimate based on membership information supplied to the Bureau of Labor Statistics by many unions and on other available sources would place the total trade-union membership in the United States in 1949 as between 14,000,000 and 16,000,000.

Source: Department of Labor, Bureau of Labor Statistics: Directory of Labor Unions in the United States, 1950. (Bull. No. 980.) Washington, Government Printing Office, 1950, 67 pp.

Table 126.—Types of health and welfare clauses in collective bargaining agreements¹

Type of clause	Number of agreements	
	Pre-Taft-Hartley	Post-Taft-Hartley
With health and welfare clauses.....	45	69
Clauses describe all features of plan.....	25	25
Clauses provide for continuing benefits in force.....	7	² 20
Clauses provide for continuing benefits in force and add other benefits.....	4	5
Clauses provide for continuing benefits in force but require employer to assume total cost.....	0	6
Clauses provide for Blue Cross benefits paid for by employer.....	0	5
Clauses provide for the union and employer to work out a benefit plan.....	4	1
Clauses provide for employer contributions, with details of benefit plan to be worked out later.....	3	0
Clauses of other kinds.....	² 2	⁴ 4

¹ Based on the conference board's analyses of 300 agreements negotiated prior to passage of the Taft-Hartley Act and 373 agreements negotiated during the year following its passage. In the analyses, industry-wide agreements covering hundreds of companies were counted only once; identical insurance programs negotiated by an employer with a number of unions were also counted as a single plan.

² In 3 contracts, the clauses provide for joint contributions.

³ Employer will investigate benefit plan proposed by union.

⁴ 1 provides for a new plan with joint contributions and the inclusion of hospitalization and surgical benefits for dependents; in 1, the employees are required to participate; in 1, insurance dividends are to be shared with participants; in 1, life insurance for retired employees is continued

Source: Brower, F. Beatrice: "Features of Union Health and Welfare Funds." The Conference Board Management Record, 9:80-83 (April) 1947; and Simsarian, Arax: "Group Insurance in Union Agreements." *Ibid.*, 10:393-398 (August) 1948.

Table 127.—Health and welfare benefits included in 50 collective bargaining agreements¹

Type of benefit	Number of agreements	
	Pre-Taft-Hartley	Post-Taft-Hartley
Total agreements.....	25	25
Insurance company group contracts:		
Life insurance.....	20	22
Accidental death and dismemberment benefits.....	20	14
Weekly sickness and nonoccupational accident benefits.....	23	23
Hospital benefits:		
Employees.....	14	17
Dependents.....	4	3
Surgical benefits:		
Employees.....	19	19
Dependents.....	2	2
Medical benefits.....	3	2
Other coverage:		
Blue Cross hospitalization plan:		
Employees.....	8	3
Dependents.....	3	0
Blue Cross surgical plan.....	0	1
Group Health plan: Employees and dependents.....	1	0

¹ Based on the conference board's analyses of 300 agreements negotiated prior to passage of the Taft-Hartley Act and 373 agreements negotiated during the year following its passage. These 50 agreements included classes describing all features of the insurance program. In the analyses, industry-wide agreements covering hundreds of companies were counted only once; identical insurance programs negotiated by an employer with a number of unions were also counted as a single plan.

Source: Brower, F. Beatrice: "Features of Union Health and Welfare Funds." The Conference Board Management Record, 9:80-83 (April) 1947; and Simsarian, Arax: "Group Insurance in Union Agreements." *Ibid.*, 10:393-398 (August) 1948.

A significant agreement recently concluded is that between the Ford Motor Co. and the United Automobile Workers of America (UAW-CIO) providing for a company-paid \$100-a-month pension plan. . . . The agreement covers over 100,000 workers. . . .

Ford workers, under the previous contract with the UAW, were receiving death, dismemberment, sickness and accident, hospital, and surgical benefits. Both the company and employees contributed to this program.

In the recent settlement, the company agreed to add an in-hospital medical benefit for employees participating in its group insurance program, at no additional cost to employees. The program, effective January 1, 1950, is to provide a daily benefit of \$4 a day for each day of confinement up to a maximum of \$280 for 70 days. . . .

Quoted from Weiss, Abraham: "Ford-UAW (CIO) Pension and Social Insurance Contract." Monthly Labor Review, 69: 649, 651 (December) 1949.

Although current attention is focused on the health and welfare programs which the larger companies and unions are including in their collective bargaining agreements, equally interesting developments are taking place in smaller industries. An illustration is the health and welfare benefits provided by agreements between the Tobacco Workers' International Union (AFL) and five tobacco manufacturers: (a) American Tobacco Co., Inc., (b) Brown & Williamson Tobacco Corp., (c) Liggett & Myers Tobacco Co., Inc., (d) Philip Morris & Co., Ltd., and (e) Scotten, Dillon Co.

Health and welfare programs were incorporated into these agreements largely since the end of World War II. They covered approximately 22,000 members of the union by late spring 1949, which represents nearly two-thirds of its membership. About 9,000 members of the union in three firms, companies (c), (d), (e), receive some type of prepaid hospital and physician care as part of these programs.

Physician care for 2,900 members in two firms, (c), (d), includes specified nonsurgical benefits in the hospital. Data are not available for maternity benefits accorded women workers. No plans include physician care in the home and office except for specified surgical procedures. About 16,000 members in two firms, (a), (c), are covered by temporary disability insurance. . . .

The health and welfare programs in the contracts with two firms, (a), (b), do not include prepaid hospital and physician care, but this is provided by company-sponsored and company-financed programs outside the agreements. In addition to these five firms, several other tobacco companies provide various types of benefit plans for their employees which are not included in their contracts with the union. . . .

Neither the union nor the manufacturers have sought to establish industry-wide bargaining or patterns. Separate negotiations are conducted on a plant-by-plant basis, or a multi-plant basis and not on a company-wide basis. As a result, variations in contract terms

are not uncommon. However, the programs tend to be similar throughout all the plants of a company. . . .

Hospitalization benefits covered by the agreements are provided through the seven Blue Cross plans serving the areas in which the plants are located. . . . Physician care benefits are provided through five medical society and two Blue Cross plans which, with one exception, serve the areas in which the plants are located. In one city, where no local medical society plan exists, physician care benefits are received locally, but are paid for by the medical society plan in a distant city where the company has its headquarters. . . .

All benefits provided the worker under the agreements with the union are employer-financed except in one program where maternity coverage is optional and at the employee's expense. Where provisions are made for including dependents, the individual worker may include his family at his own expense through payroll deductions.

All the benefit programs are administered by the company, the insuring agency, or both. Instances of union participation in the administration were given by some of the local unions, but no such provisions were found in the written agreements for these locals.

Quoted from Lear, Walter J.: "AFL Tobacco Workers Obtain Health and Welfare Benefits in Collective Bargaining Agreements." *Industrial Hygiene Newsletter*, 10:13-14 (March) 1950.

The wide variations in the medical care plans developing recently under collective bargaining are well illustrated by the following examples.

The hotel and restaurant industry of Duluth has established a health and welfare fund supported by contributions from the employers. Full-time workers are eligible for the following medical benefits: (a) Hospitalization and surgical insurance up to \$500 per case, and (b) medical care at the Arrowhead Cooperative Health Center which provides almost complete physician's care or, if the union member prefers, limited reimbursement for medical care from any licensed doctor of medicine of his own choosing.

This kind of security is unusual in an industry in which there are great seasonal variations in employment, a considerable number of part-time workers and a relatively high rate of turnover as workers shift from one employer to another. The program is designed to meet most of these difficulties. It provides for the part-time worker by fixing various levels of benefits based on the hours worked. It provides for the seasonal employee by permitting union members to continue protection by paying directly into the welfare fund during off seasons. It continues the protection of workers changing jobs within the industry under a contract which involves all employers in the industry. . . .

To implement one phase of the recent national steel settlement, 120,000 workers of the Bethlehem Steel Co. and their 300,000 depen-

dents have been enrolled on a Nation-wide basis by the Hospital Service Plan of Lehigh Valley, Pa., a Blue Cross organization. Under the uniform rate structure, the insured are eligible for 70 days of hospitalization per illness in semiprivate accommodations. The annual premium under the 5-year contract amounts to more than \$4,000,000 a year. The employees and the employer each contributes 2½ cents an hour into the health and welfare fund (this is exclusive of pensions).

Fourteen thousand stevedores and ship clerks on the west coast are beginning to collect hospital, medical, and surgical benefits under a welfare plan jointly supported and administered by the shipowners and the union. It was negotiated as a supplement to the regular coastwise agreement between the International Longshoremen's and Warehousemen's Union (CIO) and the Pacific Maritime Association.

The benefits did not become effective until extensive research had been made into community health facilities in ports from Canada to Mexico. The physician-operated Permanente Health Plan is the agency with which the trustees have made their agreement for medical, surgical, and hospital care of stevedores in Portland, San Francisco, and Los Angeles. A Seattle group health cooperative agreed to provide a similar program. In Aberdeen on Gray's Harbor, Wash., the community hospital was found to have a suitable health plan. In a score or so of other small ports, insurance plans were purchased.

Quoted from United States Public Health Service, Division of Industrial Hygiene: "Medical Care Plans Vary Widely With Kinds of Industries." *Industrial Hygiene Newsletter*, 10: 10-11 (June) 1950.

The purpose of the United Mine Workers Welfare and Retirement Fund is:

To work toward the objective of providing a prepaid form of hospital service and medical attention for the members of the organization.

To utilize existing hospital facilities and the services of private physicians under arrangements that will guarantee satisfactory standards of service.

To free the membership from paying a monthly amount deducted from their wages by meeting the expense of hospitalization and medical care through the UMWA Welfare and Retirement Fund.

To consider the provision of additional and more specialized facilities if experience demonstrates the need and funds may be available.

Mine workers and their families are distributed through 22 States, in communities of many different types. Ten Area Medical Administrative Centers were established by the fund at selected locations to conduct the work throughout the soft coal mining regions. A physician trained and experienced in organization and administration is in charge of each center. Staff personnel is provided. . . .

The Area Medical Officers arrange with individual physicians and hospitals to provide services to beneficiaries of the fund on presentation of accepted means of identification.

Physicians must be in good professional standing and acceptable to the Union members. They must indicate their willingness to render services in accordance with established operating procedures and at reasonable charge. . . .

Liaison committees are appointed by state and regional medical societies to guard against excessive charges and to assist in resolving difficulties that may arise between the physicians and the fund in relation to medical matters. . . .

From January 1 to September 17, 1949, 55,648 persons were hospitalized, 532,695 days of hospital care were provided, and 274,882 home and office visits were made. Some 6,500 physicians and 600 hospitals were listed as participating. A temporary suspension of payments was authorized by the board of trustees, dating from September 17, 1949. . . .

Quoted from Draper, Warren F. "The Medical, Health and Hospital Program of the U. M. W. A. Welfare and Retirement Fund." *Archives of Industrial Hygiene and Occupational Medicine*, 2: 261-263 (Sept.) 1950.

Administrative procedures and revised regulations of the hospital and medical services of the UMWA Welfare and Retirement Fund to become effective July 1, 1950, were released by Miss Josephine Roche, director, after approval by the trustees. . . . Under the new hospital and medical care program, *members of the UMWA, their wives and dependent children under 18*, are eligible to receive hospitalization and medical care *in the hospital* for most illnesses. . . .

Hospitals with which arrangements have been made by the fund will be paid to give hospital care in a ward or semi-private room unless the patient is so seriously ill that a private room is absolutely necessary. The physician and hospital will make this decision. Patients desiring a private room may obtain one by paying the additional cost. Each local union has been supplied with a list of the approved hospitals and physicians and the fund will pay the cost of medical care only in the institutions and by the physicians that are on this list. In some cases, the services of a specialist or a dentist may be provided. These cases must be authorized in advance by the area medical administrator in accordance with rules established by the fund.

In a brief analysis prepared for the *AMA Journal* by Dr. Warren F. Draper, executive medical officer of the fund, the limitations upon the special or extra services that may be provided at the expense of the fund were described as follows:

"Obstetric service—only when there are medical indications that hospitalization is necessary and there is advance authorization by the area medical administrator.

"Tonsillectomies and Adenoidectomies—only under certain conditions and authorized in advance by the area medical administrator.

"Mental illness—services limited to those necessary to establish diagnosis.

“Dental care—only that incident to the hospital care of a patient or which is necessary in the treatment of an illness which may require hospitalization. Advance authorization of the area medical administrator is required.

“Specialist service—only when authorized in advance by the area medical administrator.

“Eyeglasses—only in connection with surgical procedures involving the eyes.

“Home and office care—payment will not be made by the fund.

“Drugs—only as prescribed for patients under treatment in the hospital.

“Services are not provided by the fund which are available to the patient from other agencies, either voluntary or governmental; nor are services which the employer or other third party is legally obligated to provide.”

Quoted from “Revised Hospital and Medical Services Approved by Welfare Fund as of July 1.”
United Mine Workers Journal, 61: 3-4 (July 1) 1950.

SECTION VIII

Governmental and Other Agency Industrial Health, Medical and Disability Programs

Governmental Industrial Hygiene Programs

History and Principles

Let me review, very briefly, the development of [governmental] industrial hygiene in this country.

It was in 1914 that the Public Health Service formed a little unit known as the Office of Industrial Hygiene and Sanitation. From 1914 to 1936 this small handful of physicians, engineers, and chemists engaged in a great deal of research that eventually was applied in several specific industries. They conducted a study, for example, of the dangers of mercury in hat-making that brought about a change in the manufacturing process to the great satisfaction of both the workers and management in the industry. Studies that are now famous were also made in the mining industry, the garment manufacturing industry, and many others. Among them was a highly important study of fatigue among interstate truck drivers. Important, too, was the initial study of anthraco silicosis, which was launched in 1933 after hundreds of workers were stricken with the disease in the hard coal regions of Pennsylvania.

In addition to investigating particular hazards, this small group accumulated a substantial amount of knowledge about a wide complex of problems. Generally speaking, lack of funds, lack of qualified personnel, and lack of interest on the part of both industry and the country as a whole prevented the widest possible use of this knowledge in those early years.

In 1935, however, the Social Security Act was passed. This legislation gave the Public Health Service authority to aid the States with grants for health work. In the field of industrial hygiene, it meant that this storehouse of knowledge could be made available to the States—which, equipped with money and information, began to set up their own industrial hygiene units. Up to that time there were only four States with industrial hygiene units.

From 1936 through the end of the war our industrial hygiene people bent their efforts toward missionary work in the States—toward getting working units established in State health departments. Literally thousands of plants and factories began cooperating with these State industrial hygienists in the interests of better health in plants and factories.

It was not missionary work in the pure sense of that word. Industrial hygienists were not asking plant managements to do something for nothing. The dollar and cents value of industrial hygiene had

long been established. In a great majority of cases, management had simply never been forced to think about the money value of industrial hygiene methods.

Today, I am glad to say, nearly every State in the Union has a functioning industrial hygiene program, and four of our cities have set up units in their local health departments. Twenty years of research and a dozen years of promoting the use of that research by the Federal Government have borne that much fruit.

Now a new development is taking place. During the war years and through the postwar years of conversion literally hundreds of new manufacturing processes have been created. Hundreds of new uses for old processes are being discovered and applied. Few of us realize, for example, how many uses are being made in industry of X-ray and other ionizing radiation. Powerful new insecticides, like parathion—a dozen times more potent than DDT—are also being brought into use. All of these processes develop their own hazards and create their own problems.

Our industrial hygiene people as a result are being pressed for research into entirely new health hazards. Enlightened industry realizes—now that it is becoming accustomed to thinking about the possible health hazards to its workers in the plant environment—that great dangers are involved in the introduction of these new processes unless care has been taken to see that employees are protected. Increased costs of workmen's compensation, costs in public relations, and costs in the not inconsiderable factor of employee morale are all affected. . . .

Every State industrial hygiene unit should have on its staff a sufficient number of physicians to carry out the job of helping you [industry] develop plans for safeguarding your employee's health and of helping you find qualified people to carry out those plans. Above all, it is the duty of the State personnel to make available to you the findings of the highly technical research work carried on by the States and by the Federal Government, and to bring to you the great store of information on industrial health that you could have through an interchange of industrial experience. This service, which you have every right to expect from your State industrial hygiene organization, can be of primary value in saving your dollars and your employees' time.

Quoted from Scheele, Leonard A.: Industrial Hygiene—"A New Frontier in Public Health and Industry." *Modern Sanitation*, 2:19-21 (February) 1950. (Mimeographed.) (Speech delivered at the 1950 convention of the American Soap and Glycerine Manufacturers' Association at the Hotel Plaza in New York City, January 25, 1950.)

The Public Health Service has a long history of cooperation with management and labor toward the improvement of employees' health. Our industrial hygienists, working with management and labor, sometimes jointly and sometimes separately, have achieved far

reaching progress in a variety of industrial activities—the hat industry, the mining industry, and the steel industry—to mention only a few. Many of the standards developed by the Public Health Service are now incorporated in collective bargaining agreements.

Recently, we have appointed an industrial hygiene advisory committee which includes not only industrial hygiene technicians from the health professions, but also public leaders in other fields. Management and labor will have equal representation among the public leaders on this committee.

One point I should like to stress. In the field of industrial health there are broad problems which go beyond the responsibilities and the competencies of health technicians—problems which require the services of the Federal and the State Labor Departments. For example, health and welfare plans developed by organized labor cannot be the exclusive concern of health technicians.

We in public health are concerned with protecting the worker from occupational hazards, but we do not consider the worker's health only in his workplace. The present concept of a health program for the industrial worker includes making available to him all the services the health agency can offer—housing hygiene, tuberculosis and venereal disease control, nutrition services, and chronic disease control.

In striving to improve the health of industrial employees as a part of the total program for the improvement of community health, we in the Federal Government must look primarily to the State health agencies. And these agencies can do the job only when they are aware of the facts and of the issues involved in gaining organized labor's confidence and support.

Quoted from Dearing, W. Palmer: Recent Developments in Public Health in the United States. Washington, United States Public Health Service. (Mimeographed.) (Speech presented at the Lake Placid Annual Conference of Health Officers and Public Health Nurses of New York State, June 21, 1949, at Lake Placid, N. Y.)

Interest in industrial hygiene received its major boost when State compensation laws prompted American industry to seek ways of cutting down compensation costs. In response to the signs of the times, the United States Public Health Service, in cooperation with the Bureau of Mines, in 1913 undertook the first intensive study of the health of workers employed in the dusty trades and of the hazards to which they were exposed. This study pointed up the gravity of the occupational disease problem and paved the way for the establishment of an Office of Industrial Hygiene and Sanitation in the Scientific Research Division of the Service in the next year.

A pattern of research into the materials and processes used in American industry and their effects on the health of workers was developed by the office, and the first report published was the result of a study of vocational diseases in the garment industry. Then came studies of tuberculosis among zinc miners, lead poisoning in the pottery trades, hazards in brass foundries, mercurialism in the hatters'

fur cutting industry and the felt hat industry, and additional studies of the dusty trades—the granite, cement, and clay industries, the mining industries, and others. The pioneer work which this office did in the field of occupational morbidity and mortality studies, and in the pneumoconioses, has provided the fundamental data which are being used the world over today. As hazards were discovered, engineers designed control devices or looked for substitute methods to eliminate the use of hazardous materials or processes. Later on, the various skin hazards in industry were studied.

During these years there was built up a huge reservoir of scientific data, knowledge which would be invaluable to industry. But this information lay virtually untapped because there were inadequate outlets to distribute it throughout the country. Until 1936, only six States had official agencies which carried on some form of industrial health activity. The passage of the Social Security Act in that year provided the funds which finally enabled the Office of Industrial Hygiene and Sanitation to encourage the initiation of industrial hygiene programs in State and local areas. Stimulated and assisted by these grants-in-aid, the State and local health departments gradually developed industrial hygiene units, until today there is at least one in nearly every State.

The Division of Industrial Hygiene, into which the old Office of Industrial Hygiene and Sanitation evolved, has continued to promote and aid in developing State and local industrial hygiene programs. Through continuous research and the combined field work of the various types of professional personnel, the division also discharges its responsibility of developing methods to protect the health of workers and to help them achieve the best physical and mental conditions possible. The adoption of these methods in industry is promoted so that the worker may benefit from scientific advances. The scope and content of industrial hygiene work has broadened considerably in the last two decades. Governmental personnel engaged in this work in 1913 included only the medical, engineering, and chemical professions. Today, the services of physicians, dentists, nurses, engineers, physicists, chemists, laboratory technicians, statisticians, and others are required to keep the health of the worker at the highest possible level. Funds spent by the States for industrial hygiene work have trebled in the past 10 years, indicating a widening range of activity.

The chief contribution of the Federal Government has been the development of the know-how and leadership in a highly complicated and technical field and of a Nation-wide network of industrial hygiene units. Direct responsibility for protecting the health of the worker, however, rests with these State and local industrial hygiene units, of which there are 58 at present. These agencies employ approximately 400 professional personnel.

Most of the field activities of the State and local industrial hygiene units are devoted to routine investigations and evaluations of environmental health hazards and recommendations for their control. The services also include medical evaluations of industrial diseases and improvement of in-plant health programs. Last year, these agencies reported 37,336 different services to 25,700 industrial establishments, covering almost 6,000,000 workers.

In addition to direct industrial hygiene services, these units bring to industry more or less complete health programs by integrating their work with that of other divisions in the State government, such as sanitation, venereal disease control, and tuberculosis control. They maintain cooperative working relationships with other State agencies, unofficial health groups, and professional organizations. Their programs are integrated with that of the Division of Industrial Hygiene of the Public Health Service through such activities as consultative services on administrative and technical phases of programs, the application of standard practices, and the conduct of research field studies.

Quoted from Townsend, J. G.: "The Government in Industrial Health." *American Journal of Public Health*, 40:585-587 (May) 1950.

Work of State and Local Industrial Hygiene Agencies

Maintenance of the health of the Nation's labor force is a direct responsibility of State and local industrial hygiene agencies in the country. How well this responsibility is carried out may be ascertained from the annual reports of 45 of these agencies in 38 States. These reports tell of industrial hygiene services provided almost 6,000,000 workers in the interest of maintaining a healthful working environment. They strongly reflect the fact that no other public health field presents such a multiplicity of problems and situations involving the health and welfare of so large a segment of our population or offers such diversified activity. These annual reports are used for obtaining a picture of industrial hygiene activities in this country, carried on by the reporting agencies during the 1947 calendar or 1948 fiscal year.

ADMINISTRATIVE ORGANIZATIONS. At the present writing, 58 State and local industrial hygiene units are functioning on a full or limited basis in 44 State health departments, 2 State labor departments, 8 local health departments, the District of Columbia, and the Territories of Hawaii, Puerto Rico, and Alaska. The appropriations for 1948 fiscal year totaled \$2,500,723, of which 53.5 percent was derived from Federal sources, and 46.5 percent from State and local sources. . . .

In addition to direct industrial hygiene services, the agencies bring to industry more or less complete health programs by integrating their work with that of other divisions in the State government, such

as sanitation, venereal disease, and tuberculosis control. When feasible, they maintain working relationships with local health departments in their investigative work in industries in their areas, and utilize their facilities as headquarters for branch offices. They cooperate with labor departments and industrial commissions through exchange of reports of occupational diseases and reciprocal arrangements for field investigations. Cooperative relationships are also maintained with professional organizations such as the medical societies and nurses' organizations, particularly concerning in-plant health services, and with labor unions in enlisting management and employee cooperation and in arranging for studies and health services. State and local programs are integrated with that of the Division of Industrial Hygiene, Public Health Service, through such activities as consultative services on administration and technical phases of programs, the application of standard practices, and in the conduct of research field studies.

FIELD SERVICES. Most of the field activities are devoted to routine investigations and evaluations of environmental health hazards and recommendations for their control. When the agencies are staffed with medical and nursing personnel, the services are extended to medical evaluations of industrial diseases, and to improvement of in-plant health programs. However, each service, each investigation, is unique in itself and demands individual attention and solution, often taxing the ingenuity and knowledge of staff members. . . .

IN-PLANT HEALTH SERVICES. An extensive variety of activities was likewise reported by medical and nursing personnel in the State and local industrial hygiene agencies. In addition to medical evaluation and assistance with diagnosis and treatment of occupational illness, considerable work was done in assisting individual plants in organizing or improving health services for their workers.

It is not known how many industries have started new health programs during this period, but isolated reports indicate that such programs are being initiated. For example, the South Carolina division reported the establishment of 13 new health programs with medical and full-time nursing services. Tennessee reported that 17 plants for the first time employed graduate nurses for their dispensaries.

As a rule, small plants either cannot afford full-time medical services for their employees or are not aware of the benefits to be derived from such services. As the bulk of industrial establishments in this country falls into this category, efforts are exerted by State and local divisions in devising ways for bringing essential medical services to workers in small plants and in demonstrating the value of the services. The problem is approached in numerous ways. In Connecticut a group of small industries which have full-time registered nurses and the necessary medical facilities employed a full-time physician who spends a number of hours at each plant in order to provide adequate

medical service. In Los Angeles city a public-health nurse with industrial experience, assigned from the Division of Public Health Nursing, made weekly visits to a group of participating plants as part of a project to demonstrate the value of part-time service in order to induce the plants to initiate their own programs. In Syracuse, N. Y., a similar project was undertaken with the cooperation of the Visiting Nurses Association. In Georgia, the Winder clinic, established in 1942, and maintained cooperatively by a group of neighboring industries, is continuing to operate successfully. The chief drawback in starting similar plans among other industries is the shortage of medical and nursing personnel.

During the recent year, projects were undertaken to determine the status of the health of workers as a whole through State-wide or industry-wide studies. The New Hampshire division made a comprehensive study in cooperation with other health agencies in the State department and uncovered many unsuspected health hazards, notably serious heart conditions in employees working on dangerous moving machinery, active tuberculosis cases, syphilis, and trench mouth. Individuals working in key positions which require alertness and good hearing were found to have defective hearing.

The Pennsylvania division is investigating the status of dental health among workers handling such products as sugar and flour; lead, mercury, and other chemicals. The division has its own portable unit and has made 2,144 dental examinations, including X-rays. Studies conducted by this division, as well as those being conducted by the Public Health Service in specific industries, may throw considerable light on the association of oral manifestations with industrial exposure to certain materials.

In Mississippi, the division is sponsoring a State-wide physical examination program whereby private physicians examine workers referred to them by industries. The examinations are paid for by the companies, and the standard physical examination forms are supplied by the State industrial hygiene division. Copies of the examinations are sent to the division to permit a study of the physical conditions revealed by the examinations.

About one-half of the agencies reported a continuation of cooperative activities with the divisions of tuberculosis control in case-finding surveys. As a result of such cooperative programs approximately 400,000 workers received chest X-rays during the period covered by this summary. As a rule, the industrial hygiene divisions make the necessary arrangements for holding the clinics. Pennsylvania is an exception in that the entire program and work is the responsibility of the industrial hygiene division. An outgrowth of these surveys is the development of arrangements, as in St. Louis, whereby it will be possible for plant physicians to have applicants receive a small film chest X-ray through the health centers as part

of the preplacement physical examinations. The case-finding programs have proved valuable in uncovering not only cases of tuberculosis but also cases of suspected silicosis with history of dust exposure.

OCCUPATIONAL DISEASE REPORTS. Reports of suspected or confirmed cases of occupational illness serve as a valuable source to industrial hygiene divisions for investigating health hazards. The value of such reports to workers and employers is illustrated by a follow-up of two cases of lead poisoning reported in a ceramics plant employing 350 workers. The industrial hygiene division which investigated the report learned from interviews with physicians attending the patients and other community physicians that there were several other cases which had not been reported as being of industrial origin. At the same time, a community chest X-ray survey uncovered several cases of silicosis with histories of employment at the plant. Technical studies by the local industrial hygiene division revealed that practically every production employee was exposed to severe silicosis or lead poisoning hazards of which management was not aware. As a result of these studies, the company installed dust control equipment worth thousands of dollars. A workers' health service, with a registered nurse in charge, was also inaugurated in order to prevent further occurrence of occupational illness. This is an account of one case. There are other instances similar to this one.

The situation regarding the reporting of occupational diseases in the country, as determined from available reports, shows little improvement. . . . A total of 31,400 cases of suspected or actual illness was reported for the annual period. Dermatitis continues to be the leading occupational disease reported, accounting for over one-half of the 31,400 cases listed. However, it is difficult to draw any conclusions . . . on the occurrence of specific industrial diseases, owing to differences in classifying diseases. The summary is merely a combination of individual lists of cases compiled by the agencies, which sometimes gave specific causes and other times only broad categories.

Many divisions have taken definite measures to stimulate the reporting of occupational illness from all sources, but they likewise report that progress is slow. Even where regulations and statutes exist, the reporting of cases to State boards of health is still notoriously poor. Only five percent of the cases listed in table 131 represents reports made by boards of health. The remaining 95 percent consist of reports of claims submitted for compensation or morbidity reports made by compensation agencies and referred to industrial hygiene divisions.

EDUCATIONAL ACTIVITIES. Each agency devoted considerable effort to informing labor, industry, civic, and professional groups on different phases of industrial health. Various media, such as bulletins, posters, radio, exhibits, films, and institutes, are utilized in furthering these informational and educational activities. . . .

Quoted from Trasko, Victoria M.: "The Work of State and Local Industrial Hygiene Agencies." Public Health Reports, 64: 471-484 (April 15) 1949.

Table 130.—Participation of State health departments ¹ in industrial hygiene programs, by type of activity, fiscal years 1949 and 1950

Type of activity	Number of agencies performing in 1949	As planned for 1950		
		Number of States expanding	Number of States initiating	Number of States not performing
Initial surveys of industrial establishments for determination of hazards.....	53	29	0	0
Conduct of technical studies of potential health hazards.....	51	32	1	1
Laboratory and field analyses of environmental materials.....	51	33	0	2
Coordination of activities of other official and voluntary agencies for improvement of the health of industrial workers.....	51	22	¹ 1	1
Promotion of industrial hygiene education facilities.....	49	23	¹ 3	1
Investigation of suspected or reported occupational diseases.....	48	25	1	4
Distribution of health education materials.....	48	22	2	3
Staff participation in teaching industrial hygiene.....	43	16	¹ 4	6
Development of health education materials.....	42	23	¹ 4	7
Appraisal of plant medical departments.....	40	14	2	11
Analysis of clinical materials.....	40	14	2	11
Provision of consultant services regarding establishment or improvement of plant nursing services.....	39	17	1	13
Development of instruments and methods.....	39	14	¹ 2	12
Provision of consultant services regarding establishment or improvement of plant medical programs.....	37	16	2	14
Conduct of a program for improving occupational disease reporting.....	34	17	¹ 6	13

¹ Includes data submitted by 2 States, New York and Massachusetts, in which industrial hygiene program is the responsibility of an agency other than the State health department.

² Discontinued item reactivated in 1 State.

³ Discontinued item reactivated in 2 States.

Source: U. S. Public Health Service. (From information submitted in the Annual Combined Report and Plan of State Health Departments, for the fiscal year ending June 30, 1950.)

Table 131.—Summary of field and related services ¹ given to industrial establishments by 45 State and local industrial hygiene agencies ²

Type of services ³	Services given		Number of reporting agencies
	Number	Percent of total services	
General type of field services			
Total services.....	37,336	100	45
Plant surveys.....	8,214	22	45
Technical studies of occupational health hazards.....	3,734	10	44
Nuisance complaints investigated.....	374	1	33
Other environmental types including routine inspections, sanitation inspections.....	13,814	37	33
Services pertaining to promotion, establishment or improvement of:			
In-plant health programs.....	2,240	6	27
Nursing services specifically.....	2,987	8	28
Occupational disease investigations.....	374	1	20
Miscellaneous services pertaining to in-plant feeding, case finding surveys, etc.....	745	2	19
Follow-up on status of recommendations.....	4,854	13	40

See footnotes at end of table.

Table 131.—Summary of field and related services ¹ given to industrial establishments by 45 State and local industrial hygiene agencies ²—Continued

Type of services ³	Services given		Number of reporting agencies
	Number	Percent of total services	
Related services			
Total services.....	76, 973	100	45
Physical examinations of workers.....	2, 226	3	13
Dental examinations of workers.....	2, 144	3	1
Examination of plans for ventilating and other control equipment....	2, 649	3	12
Laboratory examinations and analyses.....	39, 665	52	40
Field determinations of atmospheric contaminants.....	15, 656	20	37
Field determinations of physical conditions.....	14, 633	19	35

¹ Related services refers to services performed in connection with technical studies and investigations of claims for occupational diseases. In addition to these services which are performed by industrial health personnel, other health services are provided to industrial workers by the health department staffs in such fields as tuberculosis control, health education, venereal disease, nutrition, and chronic disease.

² Based on annual reports for 1947 calendar or 1948 fiscal year. The agencies are located in 38 States and gave services to 25,700 industrial establishments, involving approximately 6,000,000 workers or 11 percent of the labor force in the States served. While practically every industry was represented, major emphasis continued to be placed on industries with potential health hazards, such as manufacturing, mining, and related services.

³ Classification does not attempt to evaluate the length or extensiveness of the various services. For instance, a plant survey may require only 1 visit for completion; a lead study may require a series of visits over weeks, involving much detailed field and laboratory work.

Source: Trasko, Victoria M.: "The Work of State and Local Industrial Hygiene Agencies." Public Health Reports, 64:471-479 (Apr. 15), 1949.

State Industrial Dental Program

In the fall of 1943 the Pennsylvania Department of Health appointed a dental consultant to develop an industrial dental program for the Bureau of Industrial Hygiene. . . .

The program developed following this association was confined mostly to an educational one—not for the employee, but for plant management. This type of procedure was necessitated primarily by the impossibility of securing dental equipment which could be used for plant studies and surveys. Conferences were held with many industries in all sections of the State. These conferences were self-initiated and were made to create good will, thereby laying the groundwork for future contacts. By contacting the dental profession in these areas the necessity for their cooperation was also brought forth.

Early in 1947 when dental equipment became available the Bureau was successful in procuring a complete dental unit which could be transported throughout the State and moved directly into any plant. The equipment included a collapsible dental chair, a treatment cabinet, a fluorescent lamp, a Ritter X-ray, portable X-ray development equipment, an intraoral fixed focus camera, a sterilizer, viewboxes, and the necessary armamentarium to conduct examinations in mass numbers.

From the contacts made earlier in the program it was very easy to select a group of industries in various areas throughout the State

in which to conduct plant studies. The objective was threefold—first, to determine the oral health of the employees in our industries; second, to detect oral diseases of occupational origin; third, to educate employees in the value of dental health. . . .

Quoted from Aston, Edward R.: *The Industrial Dental Program In Pennsylvania*. Pennsylvania Department of Health, Bureau of Industrial Hygiene, (November 11) 1948, pages 2-3. (Read before the Dental Health Section and Subcommittee on Medical Care, American Public Health Association.)

Duties and Qualifications of Governmental Industrial Hygiene Personnel

Industrial Hygiene Physician

Definition.—Under general administrative direction to plan, maintain, and coordinate an industrial hygiene medical program on a State or community basis.

Duties.—Among the duties of the industrial hygiene physician are:

1. To appraise the health of workers in terms of exposures to toxic substances and to abnormal working conditions in industry and in terms of the industrial environment as a whole.

2. To interpret medically the interrelation between industrial and nonindustrial environments upon the health of workers.

3. To interpret available toxicological data on substances used in industry in terms of its effects on workers and to determine the toxicological properties of new substances.

4. To indicate to the engineer and chemist where health hazards exist in industry which require their study and consideration.

5. To collect, interpret, and disseminate statistical information as to the incidence of morbidity and mortality in relation to specific working environments and to industries as a whole.

6. To contribute to a knowledge and medical understanding of the clinical pictures presented by industrial diseases, and assist thereby in their early recognition and prevention; and to provide clinical and laboratory criteria for their correct diagnosis, and differential diagnosis from other medical disease entities presenting similar clinical complexes.

7. To provide the medical knowledge of industrial diseases required for the intelligent development of compensation laws, for the guidance of referees in the administration of such laws, and for the development of laws and codes designed to protect the health of industrial workers.

8. To provide medical knowledge with reference to the effects of abnormal working environments and their relation to other factors, such as preexisting disease, home environment, etc., upon the health of workers.

9. To provide guidance in the establishment of adequate medical services for industrial concerns.

10. To study the interrelations between preexisting disease, and subsequent accidents or occupational diseases.

11. To study ways and means for the detection of hypersusceptible workers in advance of exposure so that workers may be employed in accordance with physical and mental fitness insofar as possible.

12. To inform engineers, chemists, employment managers, plant physicians, workers, and all other interested persons in the principles of health maintenance in industry.

13. To work in cooperation with the industrial hygiene engineer and chemist in the study of occupational hazards and the means for their control.

Minimum Qualifications:

1. Training:

(a) Medical training: The candidate must possess a degree in medicine from a grade A medical school.

(b) Medical internship: The candidate must have had a rotating medical internship or its equivalent of at least 1½ years' duration.

(c) Graduate instruction: The candidate must have had at least 1 year of graduate instruction in public health including industrial hygiene and the occupational diseases. Three years of plant or factory experience on a full-time basis may be accepted in lieu of one such year of graduate training in public health.

2. Experience: At least 3 years of experience in the practice of medicine, preferably related to the field of industrial hygiene, occupational diseases, or medical practice in connection with industrial establishments, is required.

3. Medical license: Eligibility for medical license in the State in which services are to be rendered.

4. Special knowledges and abilities:

(a) Knowledge of legislation pertaining to occupational disease compensation and control in the State.

(b) Knowledge of sanitary codes, rules, and regulations pertaining to the control of working conditions in the State.

(c) Knowledge relating to the types and number of industrial concerns in the State, the general health status of the population, and to the medical sanitary and safety facilities provided in the industries for protecting the health of the workers.

(d) Ability to establish close cooperative working relations with representatives of industry and of official and nonofficial agencies and others interested in industrial hygiene, necessitating initiative, tact, good judgment, and good address.

Industrial Hygiene Engineer

Definitions.—Under general administrative direction, to plan, maintain, and coordinate an industrial hygiene engineering program on a State or community basis.

Duties: Among the duties of the industrial hygiene engineer are:

1. To determine the existence of health hazards in industry.

2. To prepare reports of findings with recommendations for elimination or control of hazardous conditions.

3. To indicate to the physician and chemist where health hazards exist in industry which require their study and consideration.

4. To promote the collection of complete morbidity and mortality statistics from industrial establishments, and to assist in the analysis and interpretation of such biometric data.

5. To disseminate information on the engineering control of industrial health hazards to all interested persons.

6. To provide knowledge of the relationship of the working environment to industrial diseases required for the intelligent development of compensation laws, for the guidance of referees in the administration of such laws, and for the development of laws and codes designed to protect the health of industrial workers.

7. To work in cooperation with the industrial hygiene physician and the industrial hygiene chemist on the study of occupational hazards and the means for their control.

Minimum Qualifications:

1. Training:

(a) Basic engineering training: Graduation from an accredited school of engineering with a bachelor's degree in civil, chemical, or mechanical engineering.

(b) Graduate instruction: At least 1 year of graduate instruction in public health engineering, including industrial hygiene and the etiology of occupational diseases. The candidate should have graduate instruction in any of the following courses not included as part of the basic engineering training: Chemistry and chemical analysis, bacteriology, and sanitation. Two years' experience and training under a qualified industrial hygiene engineer may be accepted in lieu of 1 year graduate academic training.

2. Experience: At least 2 years' experience in general public engineering work, supplementary to educational requirements, of which at least 1 year shall have been in connection with industrial hygiene activities.

3. State registration: The public health engineer in an industrial hygiene service shall be a registered engineer in the State where he is employed, if the State requires such registration.

4. Special knowledges and abilities:

(a) Knowledge of legislation pertaining to occupational diseases compensation and control in the State.

(b) Knowledge of sanitary codes, rules, and regulations pertaining to the control of working conditions in the State.

(c) Knowledge relating to the types and number of industrial concerns in the State, the general health status of the population, and to the medical, sanitary, and safety facilities provided in the industries protecting the health of the workers.

(d) Ability to establish close cooperative working relationships with representatives of industry and of official and nonofficial agencies and others interested in industrial hygiene, necessitating initiative, tact, good judgment, and good address.

Industrial Hygiene Chemist

Definition.—Under general administrative direction to plan, maintain, and coordinate an industrial hygiene chemistry program on a State or community basis.

Duties.—Among the duties of the industrial hygiene chemist are:

1. To prepare apparatus for use in field studies.
2. To collect samples in the field pertaining to exposures of industrial workers to toxic materials.
3. To make field and laboratory analysis on samples taken in the field and on any material submitted with reference to the causation of occupational disease.
4. To check and develop new procedures for physical and chemical determinations for laboratory and field work in industrial hygiene.
5. To keep records and submit reports of findings.
6. To provide knowledge of the relationship of the working environment to industrial diseases required for the intelligent development of compensation laws, for the guidance of referees in the administration of such laws, and for the development of laws and codes designed to protect the health of industrial workers.
7. To work in cooperation with the industrial hygiene physician and the industrial hygiene engineer on the study of occupational hazards and the means for their control.
8. To indicate to the physician and engineer where health hazards exist in industry, which require their study and consideration.
9. To disseminate information on the nature and control of industrial health hazards to all interested persons.

Minimum qualifications:

1. Training:

(a) Basic chemical training: Graduation from an accredited school with a bachelor's degree in chemistry.

(b) Graduate instruction: At least 1 year of graduate instruction, including industrial hygiene and the etiology of occupational diseases. The candidate should have graduate instruction in the following courses not included as part of the basic chemical training: Industrial toxicology and chemical analysis of biological materials, gas analysis, mineralogical analysis, petrographic analysis, microchemical analysis, industrial hygiene methods of sampling and analysis of atmospheric contaminants, public health, and sanitation. Two years' experience and training under a qualified industrial hygiene chemist may be accepted in lieu of 1 year graduate academic training.

2. Experience: At least 2 years' experience in field and laboratory phases of industrial hygiene work, supplementary to educational requirements.

3. Special knowledges and abilities:

(a) Knowledge of legislation pertaining to occupational disease compensation and control in the State.

(b) Knowledge of sanitary codes, rules, and regulations pertaining to the control of working conditions in the State.

(c) Knowledge relating to the types and number of industrial concerns in the State, the general health status of the population, and to the medical, sanitary, and safety facilities provided in the industries for protecting the health of the workers.

(d) Ability to establish close cooperative working relationships with representatives of industry and of official and nonofficial agencies and others interested in industrial hygiene, necessitating initiative, tact, good judgment, and good address.

Industrial Hygiene Consultant Nurse

Definition.—Under the general administrative direction of the Chief of the Division of Industrial Hygiene and the general supervision of the Chief of the Public Health Nursing Division to plan, maintain, and coordinate an industrial hygiene nursing program on a State or community basis, and to perform other related duties as required.

Duties.—Among the duties of the industrial hygiene nurse are:

1. To assist with the development of the industrial hygiene program by advising the director and other personnel of the Division on matters which involve nursing.

2. To give consultation service to industrial nurses and management through visits to the plant involving a study of the situation and recommendations as to desirable changes.

3. To give consultation service to industries not employing registered nurses, for the purpose of stimulating interest in the provision of an industrial medical department and assisting in setting up the service either on a full-time or a part-time basis as may be indicated. Also to give advice regarding indicated improvements in the strictly first-aid service.

4. To maintain a roster of industrial nurses and nurses interested in industrial work, and a file of professional histories of each nurse with a record of vocational counseling.

5. To assist with plant surveys and studies.

6. To promote the professional growth and development of the industrial nurses through active membership in professional organizations, professional reading, and planned programs of study.

7. To cooperate with colleges and universities in the development of educational opportunities for industrial nurses.

8. To participate in educational programs for industrial nurses through institutes and classes, and in such programs for public health

nurses to promote understanding of the industrial nurse's functions.

9. To prepare educational materials for use by industrial nurses.

10. To give consultation service to public health agencies interested in providing part-time nursing service to small industries.

11. To cooperate with other divisions of the health department for the purpose of planning for the extension of their services to industry.

12. To maintain adequate records and make periodic analysis of them.

Minimum Qualifications:

1. Training:

(a) General education: Graduation from an accredited college or university.

(b) Professional education: Graduation from a school of nursing meeting the minimum requirements set by State law, and connected with a general hospital having a daily average of 50 or more bed patients, and providing, through affiliation if necessary, a program of study which shall include instruction and experience in obstetrics, pediatrics, orthopedics and communicable disease and psychiatric nursing, as well as medical and surgical nursing.

(c) Completion of at least 1 year's approved program of study in public health nursing carrying academic credit.

(d) Advanced preparation in industrial hygiene of at least one semester.

2. Experience:

(a) Two years' experience in a public health agency offering generalized service and under supervision by qualified public health nursing personnel, 1 year of which shall have been as a supervising nurse in a generalized service.

(b) Two years' experience in industrial nursing.

3. Special knowledges and abilities:

(a) Knowledge of legislation pertaining to occupational disease compensation and control in the State.

(b) Knowledge of sanitary codes, rules, and regulations pertaining to the control of working conditions in the State.

(c) Knowledge relating to the types and number of industrial concerns in the State, the general health status of the population, and to the medical, sanitary, and safety facilities provided in the industries for protecting the health of the workers.

(d) Ability to establish close cooperative working relations with representatives of industry and of official and nonofficial agencies and others interested in industrial hygiene, necessitating initiative, tact, good judgment, and good address.

Quoted from United States Public Health Service, Industrial Hygiene Division; Florida State Board of Health; and Florida Industrial Commission: *The Industrial Hygiene Problem in Florida*. Tallahassee, Florida Industrial Commission, 1946, pages 46-54.

Industrial Hygiene Dentist

A. DUTIES

1. To provide guidance in the establishment of dental services in industry for the examination, diagnosis, and emergency treatment which will insure for the worker good oral hygiene, freedom from pain and infection with reference to specific industries, processes, or substances.

2. To interpret dentally the interrelation between industrial and nonindustrial environments upon the health of workers.

3. To determine the toxicological properties of new substances and to interpret available toxicological data in terms of their effects on workers exposed in industry, as they pertain to dentistry.

4. To cooperate with the other members of the Industrial Hygiene Division in coordinating the dental health of the worker with factors that influence his general health.

5. To indicate to other industrial hygiene personnel where dental health hazards exist in industry which require their study and consideration.

6. To serve as coordinating officer between the dental profession and the Industrial Hygiene Division.

7. To collect, interpret, and disseminate information as to dental morbidity in general, and in particular the relation to specific industrial exposures or conditions in the working environment.

8. To meet with management and health committees of industry and lay organizations concerned with dental health education of workers and to meet with professional groups concerned with industrial dental programs and industrial dental health education.

9. To provide the dental knowledge of industrial diseases required for the intelligent development of compensation laws, for the guidance of referees in the administration of such laws, as a basis for the establishment of compensation insurance rates, and for the development of laws and codes designed to protect the health of industrial workers.

10. To examine employees in various industries for oral manifestations of occupational disease and other conditions resulting from industrial employment.

11. To provide dental knowledge not only with reference to the effects of specifically abnormal working environments, but also with reference to the effects of other factors, such as preexisting disease, home environment, etc., upon the health of the workers.

12. To tabulate and analyze data and to write and edit articles, periodicals, pamphlets, etc., pertaining to industrial dental health.

B. PREPARATION

1. *General education.*—The minimum requirements for general education are training in all the necessary predental subjects for entrance to a grade A dental school.

2. *Professional education.*—

(a) *Dental training.*—The candidate must possess a degree in dentistry from a grade A dental school.

(b) The candidate must have had at least 1 year of graduate instruction in public health including industrial hygiene and occupational dental diseases, or shall secure such instruction within 2 years after employment.

3. *Experience.*—At least 5 years of experience in the practice of dentistry, preferably related to the field of industrial hygiene or dental practice in connection with industrial establishments, is required.

C. DENTAL LICENSE

The candidate must possess, or be eligible to obtain, a license to practice dentistry in the State to which he is appointed. No appointee should be continued beyond the probationary period in a position in the dental portion of the field of industrial hygiene without such a State dental license.

D. PERSONAL QUALIFICATIONS

The required personal qualifications of the appointee are as follows:

(a) Ability to establish and maintain harmonious working relationships with fellow workers, the community, and industry.

(b) To work cooperatively with staff and the public.

(c) To present ideas clearly and concisely.

(d) To plan and execute work efficiently.

(e) To exercise good judgment in evaluating situations.

Quoted from American Conference of Governmental Industrial Hygienists, Committee on Professional Qualifications of Industrial Hygiene Personnel: "Report of the Committee," Proceedings of the Ninth Annual Meeting of the American Conference of Governmental Industrial Hygienists. Washington, The Conference, 1947, pages 31-33.

Legal Basis for State and Local Programs

Table 132.—Salient features of industrial health legislation in health departments

State	Authority for industrial hygiene services		Industrial hygiene service established	Rule-making powers		Enforcement powers		Related statutory provisions	Rules and regulations issued	
	Specific	Implied		Specific for occupational disease	General	Specific for occupational disease	General		General	Other
Alabama		X	X		X		X			
Arizona		X	X		X					
Arkansas	X		X	X				X	X	X
California		X	X		X		X			
Colorado		X	X		X		X			X
Connecticut	X		X		X	¹ X		X		X
Delaware					X					
District of Columbia		X	X		X		X			X
Florida	X		X		X		X		(¹)	
Georgia		X	X		X					X
Idaho	X		X	¹ X		X				(¹)
Illinois		X	X							
Indiana	X		X		X					X & ¹
Iowa		X	X		X		X			
Kansas		X	X		X		X			X
Kentucky		X	X		X					X
Louisiana	X		X		X			X	X	
Maine		X	X		X					X
Maryland	X		X	X		X				X
Massachusetts					X					
Michigan	X		X		X					
Minnesota	X		X	¹ X			X		(¹)	X
Mississippi	X		X		X		X		X	
Missouri		X	X		X		X			
Montana	X		X	X		X				
Nebraska		X	X		X					
Nevada					X		X			
New Hampshire	X		X	¹ X						X & ¹
New Jersey	X		X	¹ X						
New Mexico		X	X		X		X			
New York					X		X			
North Carolina	X		X							
North Dakota		X	X		X					
Ohio		X	X		X		X		X	X
Oklahoma		X	X		X		X			
Oregon		X	X		X		X		X	& ¹
Pennsylvania		X	X		X					
Rhode Island	X		X	¹ X						(¹)
South Carolina	X		X		X		X			X
South Dakota					X		X			
Tennessee	X		X				X		X	
Texas	X		X		X		X		X	
Utah	X		X		X					
Vermont	X		X	X		X		X		X
Virginia		X	X		X		X		X	
Washington		X	X		X		X		(¹)	X & ¹
West Virginia	X		X	X		X			(¹)	X & ¹
Wisconsin		X	X		X		X			
Wyoming	X		X				X			

¹ Jointly or in cooperation with State labor authorities.

Source: Trasko, Victoria M.: Industrial Health Legislation: A Compilation of State Laws and Regulations, July 1950. Washington, U. S. Public Health Service, Division of Industrial Hygiene, 1950, App. 1-2.

Table 133.—Salient features of industrial health legislation in labor departments

State	Agency	Authority for industrial hygiene service (specific)	Industrial hygiene service established	Rule-making powers		Enforcement powers		Related statutory provisions	Rules and regulations issued	
				Specific for occupational disease	General	Specific for occupational disease	General		General	Other
Alabama	Industrial Relations			X		X		X		
Arizona	Industrial Commission							X		
Arkansas	Labor			X				X		
California	Industrial Relations				X			X		X
Colorado	Industrial Commission				X			X		
Connecticut	Labor and Factory Inspection					X ¹		X		X
Delaware	Labor Commission							(¹)		
District of Columbia	Minimum Wage and Safety Board				X			X		
Florida	Industrial Commission			X ¹		X		X		X
Georgia	Labor			X		X		X		
Idaho	Industrial Accident Board			X ¹		X				X ¹
Illinois	Industrial Commission			X		X				X
Indiana	Labor		X			X		X		X ¹
Iowa Co.			X				X		X ¹
Kansas Co.				X			X		X ¹
Kentucky	Industrial Relations	X				X		X		
Louisiana	Labor			X		X		X		
Maine	Labor and Industrial						X			X
Maryland	Industrial Accident Commission				X			X		X
Massachusetts	Labor and Industrial	X				X		X		
Michigan	Labor						X	X		
Minnesota	Labor and Industrial	X		X ¹				X		X ¹
Mississippi	None									
Missouri	Labor and Industrial Relations						X	X		
Montana	Agricultural, Labor and Industrial				X			X		
Montana	Industrial Accident Board							X		
Nebraska	Labor							X		X
Nevada	Industrial Commission				X			X		
Nevada	Labor Commission				X			X		
New Hampshire	Labor			X ¹				X		X ¹
New Jersey	Labor and Industrial	X		X ¹		X		X		X
New Jersey	Labor and Industrial			X ¹		X		X		X
New Mexico	Labor and Industrial Commission						X			

Table 134.—Summary of requirements for reporting of occupational diseases

State	To health departments ¹		To labor departments	Reporting provisions in workmen's compensation laws ²		
	Regulation	Statute	Statute	Occupational disease specified	"Injury" defined to include occupational disease	Use of indicated terms
Alabama.....		x				
Arizona.....						Claims.
Arkansas.....	x					Injuries.
California.....				x (Rule)		Do.
Colorado.....	x					Do.
Connecticut.....		x			x	
Delaware.....						Do.
District of Columbia.....						Injury.
Florida.....						Do.
Georgia.....	x			x		
Idaho.....						Injuries.
Illinois.....				x		
Indiana.....				x		
Iowa.....	x					Do.
Kansas.....	x					
Kentucky.....	x					Do.
Louisiana.....	x					
Maine.....		x				Accidents.
Maryland.....		x		x		
Massachusetts.....			x	x	x	
Michigan.....		x				Claims.
Minnesota.....		x			x	Accidents.
Mississippi.....	x					
Missouri.....	x	x				Injury.
Montana.....		x				
Nebraska.....						
Nevada.....						Injuries.
New Hampshire.....		x				Do.
New Jersey.....		Lead poisoning ³		x		
New Mexico.....	x			x		
New York.....			x	x		
North Carolina.....				x (Rule)		
North Dakota.....					x	
Ohio.....		Lead poisoning ³		x		
Oklahoma.....		x				
Oregon.....						
Pennsylvania.....	x	Lead poisoning ³			x	Do.
Rhode Island.....		x			x	
South Carolina.....		x				Accidents.
South Dakota.....						Do.
Tennessee.....					x	
Texas.....				x		
Utah.....						Do.
Vermont.....						
Virginia.....						Claims.
Washington.....	x					
West Virginia.....						Do.
Wisconsin.....		x		x (Rule)		Injuries.
Wyoming.....						

¹ Physicians are required to report under these laws.

² Employees and, at times, physicians are required to report to industrial commissions or workmen's compensation boards.

³ Reportable to both health and labor departments.

Source: Trasko, Victoria M.: *Industrial Health Legislation: A Compilation of State Laws and Regulations July, 1950.* Washington, U. S. Public Health Service, Division of Industrial Hygiene, 1950, App. 5-6.

Professional Personnel by States

Table 135.—Governmental agencies responsible for industrial hygiene services and number and type of full-time professional personnel employed for such services, by area served, December 1949¹

Area served	Governmental agency responsible for services	Professional personnel employed				
		Total ²	Physicians ³	Nurses	Engi-neers and chem-ists ⁴	Other ⁵
All areas.....		469	47	46	336	40
United States.....	U. S. Public Health Service.....	53	15	4	24	10
States:						
Alabama.....	State Department of Public Health.....	2			2	
Arizona.....	State Department of Health.....	1			1	
Arkansas.....	State Board of Health.....	3			3	
California.....	State Department of Public Health.....	13	2	1	9	1
Colorado.....	State Board of Health.....	3			3	
Connecticut.....	State Department of Health.....	18	3	2	13	
Florida.....	State Board of Health.....	3	1		2	
Georgia.....	State Department of Public Health.....	10	1	2	7	
Hawaii.....	Territorial Board of Health.....	3			3	
Idaho.....	State Department of Public Health.....	2			2	
Illinois.....	State Department of Public Health.....	15	1	2	12	
Illinois.....	State Department of Labor.....	4			4	
Indiana.....	State Board of Health.....	5	1	1	3	
Iowa.....	State Department of Health.....	1			1	
Kansas.....	State Board of Health.....	3		1	2	
Kentucky.....	State Department of Health.....	5			5	
Louisiana.....	State Department of Health.....	1			1	
Maine.....	State Bureau of Health.....	1			1	
Maryland.....	State Department of Health.....	2			2	
Massachusetts.....	State Department of Labor and Industry.....	10	1	2	7	
Michigan.....	State Department of Health.....	22	1	1	20	
Minnesota.....	State Department of Health.....	5		1	4	
Mississippi.....	State Board of Health.....	5	1	1	3	
Missouri.....	State Division of Health.....	5		1	4	
Montana.....	State Board of Health.....	2			2	
Nebraska.....	State Department of Health.....	1			1	
New Hampshire.....	State Department of Health.....	6		1	5	
New Jersey.....	State Department of Health.....	9	1	2	6	
New Mexico.....	State Department of Public Health.....	1			1	
New York.....	State Department of Labor.....	42	6	1	33	2
North Carolina.....	State Board of Health.....	9	1	1	5	2
Ohio.....	State Department of Health.....	13	1		12	
Ohio.....	State Industrial Commission ⁷					
Oklahoma.....	State Health Department.....	2			2	
Oregon.....	State Board of Health.....	7	1	1	5	
Pennsylvania.....	State Department of Health.....	52	4	3	42	3
Puerto Rico.....	Puerto Rican Department of Health.....	3		1	2	
Rhode Island.....	State Department of Health.....	5	1	1	3	
South Carolina.....	State Board of Health.....	4	1	2	1	
Tennessee.....	State Department of Public Health.....	11	1	2	8	
Texas.....	State Board of Health.....	16			8	8
Utah.....	State Department of Health.....	2			2	
Vermont.....	State Department of Public Health.....	3			3	
Virginia.....	State Department of Health.....	4			4	
Washington.....	State Department of Health.....	5		1	4	
West Virginia.....	State Department of Health.....	4		1	3	
Wisconsin.....	State Board of Health.....	6		2	4	

See footnotes at end of table.

Table 135.—Governmental agencies responsible for industrial hygiene services and number and type of full-time professional personnel employed for such services, by area served, December 1949¹—Continued

Area served	Governmental agency responsible for services	Professional personnel employed				
		Total ²	Physicians ³	Nurses	Engineers and chemists ⁴	Other ⁵
Cities and counties:⁶						
Los Angeles, Calif.....	City Department of Health.....	6		1	5	
Los Angeles County, Calif.....	County Department of Health.....	4	1	1	2	
Oakland, Calif.....	City Department of Public Health.....	1			1	
Fulton County, Ga.....	County Health Department.....	1			1	
Baltimore, Md.....	City Health Department.....	6		1	5	
Detroit, Mich.....	City Department of Health.....	9		1	8	
Kansas City, Mo.....	City Health Department.....	1			1	
St. Louis, Mo.....	City Health Division.....	9	1	1	4	3
Newark, N. J.....	City Department of Health.....	16	1	2	2	11
Cleveland, Ohio.....	City Division of Health.....	11		1	10	
Pittsburgh, Pa.....	City Department of Public Health.....	3			3	

¹ In addition to the full-time professional personnel, the staffs of the respective health departments are available for specialized health programs for industrial workers in such fields as tuberculosis control, health education, venereal disease, nutrition, and chronic disease.

² These figures do not include laboratory technicians, clerical help, or other semiprofessional and non-professional personnel.

³ Includes 4 dentists and 1 veterinarian.

⁴ A separate count of industrial hygiene engineers and chemists is difficult, as frequently their work is interchangeable and they are both classified by State civil service agencies as industrial hygienists only. Available information indicates that about 1/4 of this group are chemists.

⁵ Includes statisticians, health educators, sanitarians, physicists, and other scientists.

⁶ Additional personnel in other city and county health departments cooperate with State industrial hygiene agencies in providing health services to industry.

⁷ Data are not available.

Source: U. S. Public Health Service, Division of Industrial Hygiene, 1950. (Mimeographed.)

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Source: U. S. Public Health Service, Division of Industrial Hygiene: Directory of State, Local, and Territorial Industrial Hygiene Personnel (March) 1950. (Multilithed.)

Federal Employee Health Program

[Dr. A. J. Lanza, Director of the Institute of Industrial Medicine, New York University, told a recent conference on health programs for Federal workers that] Government once lagged far behind industry in setting up industrial medical programs, . . . but World War II stimulated Government establishments into active measures based upon the standard and accepted industrial medical program. Dr. Lanza quoted a statement made last month in which an executive of a large corporation described how his company had effected very large savings in the costs of accidents and in compensation. The executive added, "I believe that if we are willing to spend money for improved medical service the improvement in health will show even greater dollar savings for employees, stockholders, and communities than was earned by the safety program." Dr. Lanza said that if for stockholders we substitute taxpayers we can apply this statement to the discussion of the Federal employee health programs. . . .

The President's policy statement covering the establishment and operation of Federal employee health programs states that "the maximum permissible cost of the health service will be \$8 per year per employee to be served unless special industrial conditions or other abnormal health or accident risks exist which warrant an additional allowance. In the case of small agencies, due allowance will be made for meeting the cost of the minimum health service.

"The services furnished shall consist of treatments of on-the-job illnesses which usually are administered by a physician or nurse without the need for extensive diagnostic and therapeutic clinical equipment; preemployment and fitness for duty examinations; referral to private physicians and dentists or existing community

resources; and administration of treatments or medications upon the request of the employee's private physician in the interest of keeping the employee on the job."

The statement also specifies that in the interests of lower costs and uniform services to employees, the agencies are encouraged to consult with the Public Health Service on their requirements for such programs, contract with the Public Health Service in communities where it has adequate and acceptable out-patient facilities, or arrange with other Government agencies for a medical department or to operate their own facilities where other Federal medical facilities are not available.

The statement continues, "Health services under this program shall be provided in health rooms staffed with personnel qualified in public health work to as large a number of Federal employees as is reasonable and feasible to undertake (1) in metropolitan Washington, (2) in those cities outside Washington which have large concentrations of Federal employees, (3) at industrial type installations or similar activities presenting abnormal health and accident risks to employees, and (4) at other locations where an agency employs a large number of personnel in a single building or an adjoining group of buildings." At least 300 employees in a single building or an adjoining group of buildings are required to warrant the establishment of a program. . . .

Mr. Frederick J. Lawton, Director of the Bureau of the Budget, again stated that the interest of the President is a positive one. Today there is clear recognition that the health program represents a constructive approach to employee morale and sound personnel management. He stated that we are now spending 6½ million a year on the employee health programs, but that we have a considerable distance to go before the services are available to the nearly 2 million Federal employees in widely scattered areas. He stated that the Bureau of the Budget's job is to insure that the development of the programs in cooperation with the Public Health Service is meeting immediate needs throughout Government. . . .

Mr. Jess Larson, Administrator of the General Services Administration, stated that industry has paved the way in demonstrating the value of health programs for employees and that Government has been woefully slow in recognizing that value. He said that nothing contributes more to happiness and security than good health programs and the feeling that top management, including the Congress, is interested in the well-being of employees. He believes that, if anything, these programs are all too modest. He emphasized the importance of preemployment and periodic physical examinations and the need for the health, safety, and personnel work to be tied closely together.

This point was vigorously reinforced by Dr. R. C. Williams, assistant surgeon general of the Public Health Service, who has been a leader in developing occupational health programs for Government em-

ployees. He said that at a time when all public-minded citizens are becoming more and more interested in the promotion of health, it is important that special attention be given to providing health services to Federal employees. The maintenance of positive physical and mental health requires health examinations for detecting symptoms of disabling illnesses, referral of employees for needed medical care, health counseling, education and guidance, and the maintenance of work environment free from health hazards. It entails close cooperative interaction and planning with agency officials concerned with safety, personnel, and production. As public servants of the taxpayer, he said, we have a grave joint responsibility for promoting efficiency, reducing the incidence of chronic disabling illnesses and accidents which place such heavy costs on our society, and for providing the quality of health services which will improve the health status of our nation. . . .

Dr. Lanza agreed that there is no question but that health conservation is sound economy, but he stated that it also brings with it greater values in physical, mental, and spiritual well-being. "Our thinking and our practice have come a long way since we began to restrict the employment of children and women," he said. "Good health and good working conditions are just as important to the office worker as they are to the worker in heavy industry. Both types of worker depend upon good health for satisfaction with their jobs and the employer is just as much concerned with the employees' health as they are," he added, pointing out that the interests of the employer and the employee are interdependent, that what helps one helps the other and whatever is detrimental to one in the long run will be detrimental to the other.

Quoted from Klem, Margaret C., and Niles, Mary Cushing: "Industrial Health Programs Recommended for Federal Workers." *Industrial Hygiene Newsletter*, 10: 3-4, 16 (August) 1950.

What is a Federal employee health service It is a service designed to promote and maintain the physical and mental fitness of employees of the Federal Government. The Government is interested in the health of its employees because their physical and mental fitness bears a relation to work efficiency and sickness-absenteeism. Healthful employees in a healthful environment produce more work and better work.

What services are provided? Federal employee health services are limited to:

1. Treatment of on-the-job illness and dental conditions *requiring emergency attention*,
2. Preemployment and other examinations,
3. Referral of employees to private physicians and dentists, and
4. Preventive programs relating to health.

Who is eligible for service? Any Federal employee (not including employees of Tennessee Valley Authority, Panama Canal, and

Panama Railroad Co.) whose position is classified or not, provided; Funds have been appropriated for a health service program in his locality and by his department or agency.

What is the legal basis for a Federal employee health service? Public Law 658, Seventy-ninth Congress, authorizes the heads of departments and agencies, including Government-owned and -controlled corporations, to establish employee health service programs; provided, this be done only

1. After consultation with the United States Public Health Service and consideration of its recommendations, and
2. In localities where there are a sufficient number of Federal employees to warrant such a service. . . .

Is it a full medical care program? No. The employee health service does not provide medical treatment other than emergency care for on-the-job illness. However, it may give such treatment as private physicians and dentists prescribe for their patients (employees) while on the job.

Referral to private physicians and dentists. The employee health service is not a complete medical care program. It does not substitute for the private physician or dentist. By referral it encourages and helps the employee to make better use of his private physician and dentist. The employee health service would also cooperate with resources within the community in the promotion and maintenance of the physical and mental health of employees. . . .

Healthful working environment. Unhealthful work conditions must be prevented in order to provide the employee with a healthful work environment. This requires the services of a specialist—the Public Health Engineer. His services include consultation, inspection, and recommendations in regard to sanitation of eating places, water supply, disposal of wastes, occupational hazards, heating, ventilation, lighting, rodent control, and related environmental problems.

Preventive programs relating to health. A state of good health is more than an absence of illness. It is one of the most important means of enabling an employee to do a better job. Hence, the agency should cooperate with the employee in his effort to stay well. Threats to employee's "physical and mental fitness" can be reduced. Four methods of preventing illness and maintaining good health through an occupational health service are:

1. To provide a healthful work environment.
2. To immunize against communicable diseases when exposure occurs on the job.
3. To give health guidance and health information.
4. To recognize illness and refer for treatment EARLY.

Treatment of one-the-job illness. This service is defined in Public Law 658 as "treatments of on-the-job illness and dental conditions requiring emergency attention." This may include simple remedies

for minor complaints or vital measures taken before a seriously injured or ill employee is seen by a physician.

No employee health service is complete without first aid. No employee health service is adequate which furnishes only first aid. An adequate employee health service must be based on the principles of prevention.

Confidentiality of medical information. All medical information on employees should be treated as confidential material. The United States Public Health Service strongly recommends that medical examination reports and health records be filed in the health unit and be directly available only to medical personnel. Interpretative reports may be furnished non-medical agency officials for official use. Medical information may be released to private physicians or dentists at the request of the employee.

Quoted from United States Public Health Service: *Health Service for Federal Employees.* 7 pages.
(Processed.)

Governmental Disability Insurance Programs

Railroad Retirement Sickness Benefit Program

Ten years of benefit operations under the Railroad Unemployment Insurance Act were completed with the close of the 1948-49 benefit year. During this 10-year period, \$247,160,000 was paid in benefits to railroad employees—\$190,732,000 for periods of unemployment and, in the last 2 years, \$56,428,000 for periods of sickness. . . .

The year 1948-49 was one of substantial growth and development for the sickness benefit program. Although there was no evidence of a marked increase in the amount of sickness among railroad workers as compared with 1947-48, more sickness was recorded and more employees were paid benefits, both in total and in relation to the number of qualified employees. The average amount of benefits, the average number of days of sickness, and the exhaustion rate were all significantly higher. Nearly all of these increases resulted, directly or indirectly, from a growing awareness of employees of their rights and responsibilities under the program—an awareness which expressed itself both in a greater number of sicknesses reported and in a greater proportion of the sickness for which benefits could be paid.

Much of the increase in participation and in compensable sickness was due to the continuing efforts of the Board to acquaint employees with the way the program works. . . .

Measures were also taken during the year to make sure that sickness benefits were paid only to employees entitled to them. In the course of the year field representatives made special visits to claimants, their employers, and doctors in about 3,200 cases. These cases did not represent a random selection. Only nonhospitalized claimants whose inability to work was not conclusively established by objective findings, or whose cases met certain other specifications, were selected. In more than one-fourth of these cases, it was found that the claimants would be "unable to work" longer than originally estimated; in one-tenth, that they would recover by the time originally estimated or somewhat sooner; and in a somewhat smaller proportion, that more information was needed. In about 200 cases, it was learned that the employee was receiving other payments which might affect his rights to benefits, but that usually he was not aware that such payments should be reported to the Board. Evidence of probable fraud was developed in only 12 cases. . . .

Benefits for sickness (other than maternity) which occurred in 1948-49 were received by 151,200 railroad employees, after adjustment for recoveries. The average amount of benefits per beneficiary—\$188—and the average days of sickness—69—were significantly higher than comparable figures for the preceding year. Also those paid benefits formed a larger proportion of all “qualified employees”—that is, of those who earned \$150 or more in railroad employment in the appropriate base year. . . .

More than 90 percent of the beneficiaries in 1948-49 had only one spell of creditable sickness during the year; a small number had as many as four or more. . . .

Including only diseases common to both sexes, women were found to be relatively more subject than men to nervous and mental disorders, glandular disturbances (especially goiter), blood disorders (principally anemias), and ill-defined diseases. Men were more subject to circulatory and digestive diseases and to injuries. . . .

Age was an important factor affecting the frequency with which employees became beneficiaries. . . . Fully one-half of the beneficiaries were sick no more than 6 weeks. . . .

Occupational differences in duration were largely associated with the age composition of the beneficiaries in those occupations. It has long been recognized that duration of illness, as well as frequency, increases with age. . . .

The above discussion of duration of sickness covers only creditable days of sickness. A particularly important omission is sickness which occurred before the first creditable day. For almost half of the beneficiaries the first creditable day was after the second day of illness. For 20 percent the interval was 20 days or more; and for 12 percent, 60 days or more.

For beneficiaries who were sick before July 1, 1948, this interval consisted principally of the period between the onset of sickness and the beginning of the benefit year. In other cases, it was due to such factors as late filing of applications or claims, vacation or sick-leave pay, other social insurance benefits, or settlement for personal injury. For example, executives customarily continue to receive their regular pay for a while after becoming unable to work. Also, for one-tenth or more of the train-and-engine-service beneficiaries, the beginning of the first claim period was delayed several days to avoid disqualification due to high train-and-engine-service earnings. Way and structures laborers, on the other hand, because of high turn-over and the seasonal nature of their work, are, as a group, less familiar with the filing requirements of the law. Younger workers had less time intervening between the onset of sickness and the first creditable day than older ones, mainly because there were fewer young workers in the group of beneficiaries whose illness began before July 1, 1948.

Quoted from Railroad Retirement Board: Annual Report 1949. Washington, Government Printing Office, 1950, pages 34, 52-54, 56-58.

Sickness insurance benefits to railroad workers under the amended railroad unemployment compensation act became payable in July 1947. The benefits are financed from the unemployment tax paid by railroad employers. Eligibility and benefits are determined on the basis of earnings in covered employment in the base year. All workers with \$150 earnings in the base year are eligible for benefits during the benefit year for a maximum period of 26 weeks. The daily benefit amount is \$1.75 to \$5. After the initial waiting period and the first benefit week benefit payments are fortnightly, with 10 compensable days in each 2-week period.

Separate benefits are provided for maternity cases among covered workers for as long as 115 days. The rate of payment per day for maternity is the same as for sickness, but payments are made for every day, instead of for 10 days out of 14. Moreover, during the first 14 days in the maternity period and the 14 days immediately after delivery the daily benefits are increased by 50 percent.

Benefits are paid for all types of disability, but if claimant is entitled to payment from his employer or a third party, the fund is empowered to recover an amount equal to damages or the benefits paid, whichever is the smaller.

Quoted from Sanders, Barkev S.: In a volume dealing with employment and wages prepared for the Twentieth Century Fund by W. S. Woytinsky and Associates, to be published in 1951.

Railroad Retirement Program

Name of program: Railroad Unemployment Insurance Act, sickness and maternity benefits.

Type of law: Government plan administered by Railroad Retirement Board in coordination with unemployment insurance.

Name of agency: Railroad Retirement Board.

Method of insuring: All employers insured with the Government fund—benefits paid out of railroad unemployment insurance account; no separate fund for these benefits.

Effective date of contributions: No additional or separate contribution.

Effective date of benefits: July 1, 1947.

Coverage: Railroad workers covered by railroad unemployment insurance.

Financing: Employer contribution—no additional contribution for temporary disability insurance.

Administrative financing: Out of railroad unemployment insurance administration fund—0.2 percent of taxable wages allowed for administration of both programs.

Administrative costs of private plans: No private plans.

Definition of disability: Inability to work because of physical, mental, psychological, or nervous injury, illness, sickness, or disease.

Payments for pregnancy: Special maternity benefits for a period beginning 57 days before expected date of childbirth, and ending 115 days later, or 31 days after child is born, whichever is later, but not more than 84 days' benefits before childbirth. Benefits for first 14 days in maternity period, and first 14 days after childbirth at 1½ times regular rate. Maternity benefits not deductible from regular duration. Disabilities due to pregnancy not excluded from regular benefits.

Benefit formula: Same as unemployment insurance:

Benefit year: Uniform, beginning July 1.

Base period: Calendar year preceding benefit year.

Qualifying earnings or employment: \$150 in base period.

Weekly benefit amount: Daily benefit amount of \$1.75–\$5, based on schedule of annual wages; \$17.50–\$50 for 2-week registration period after the waiting period.

Duration: Uniform 130 days—26 weeks, \$227.50–\$650. Duration separate from unemployment insurance

Waiting period: 7 days in first 14-day registration period in a benefit year; benefits not paid for first 4 days of sickness in subsequent 14-day registration periods.

Part weeks of disability: Benefits paid for each day of disability in excess of 4 in a 14-day registration period after the waiting period.

Benefit formula for private plans: No provision for private plans.

Administrative procedures:

Claims: Initial and continued claims to nine regional offices by mail. All maternity benefit claims to Chicago central office by mail.

Medical certification of disability: Applications must be signed by a doctor of medicine, an osteopath, or a dentist. Continued claims must have similar certification on request.

Required medical examinations: Agency has designated physicians to give examinations to claimants directed by the agency to report for such examinations, and pays the physicians a scheduled fee for each case.

Quoted from Department of Labor, Bureau of Employment Security: Unemployment Insurance Program Letter No. 186, (Jan. 17), 1950.

Table 136.—Beneficiaries under railroad retirement sickness program, average sick spells and days of sickness, by sex, race, and age, for sickness benefit year 1948-49¹

Sex and race	Total ²	Age on birthday in 1948											
		Under 20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over
Number of beneficiaries													
Total ¹	151,245	655	5,265	8,065	10,230	11,600	14,655	18,450	22,145	24,270	23,690	9,580	2,635
Male white.....	123,450	595	3,880	5,880	7,835	8,660	10,975	14,225	18,235	21,010	21,290	8,485	2,380
Male Negro.....	17,095	20	390	970	1,325	1,740	2,115	2,615	2,540	2,385	1,820	945	240
Female white.....	8,165	35	915	915	795	850	1,125	1,195	1,110	680	425	105	15
All others.....	2,525	5	85	300	275	345	440	415	260	195	155	45	0
Beneficiaries per 1,000 qualified employees													
Total ¹	72.0	16.6	23.3	33.6	45.0	56.6	66.5	77.3	97.5	116.6	146.0	120.4	120.6
Male white.....	73.2	17.7	22.8	32.1	44.3	56.0	64.8	75.0	96.7	116.4	146.1	116.2	121.0
Male Negro.....	67.3	8.0	13.9	29.1	39.7	50.4	63.2	87.7	105.9	136.2	164.8	192.2	140.7
Female Negro.....	72.7	11.7	39.9	52.9	74.7	84.8	98.6	83.8	107.4	96.1	112.7	107.0	41.6
All others.....	73.4	24.9	24.0	62.5	57.5	74.4	94.2	100.0	77.9	88.0	123.3	99.3	0
Spells of sickness per 1,000 qualified employees													
Total ¹	79.1	17.0	24.8	35.7	48.8	62.4	72.0	85.7	108.0	129.5	164.1	129.3	129.8
Male white.....	80.5	18.1	24.2	34.0	48.1	61.6	70.2	83.1	107.4	129.3	164.6	124.5	130.6
Male Negro.....	73.6	8.0	15.0	13.6	42.7	55.9	67.4	97.1	115.9	149.9	183.4	211.5	146.5
Female white.....	79.6	11.7	42.3	56.6	81.3	95.3	107.8	94.7	115.2	108.1	124.6	112.1	41.6
All others.....	81.0	24.9	25.4	63.5	63.8	83.0	106.0	108.5	88.4	110.5	127.3	99.3	0
Days per spell													
Total ¹	62.6	39.1	46.2	46.2	44.8	50.8	53.9	59.1	63.0	68.2	74.8	83.4	100.9
Male white.....	63.1	37.9	45.3	44.4	44.3	51.3	53.3	59.0	62.6	68.3	74.5	83.4	99.7
Male Negro.....	58.6	77.0	36.7	47.4	41.6	43.4	50.5	58.7	59.6	67.1	73.4	81.9	111.4
Female white.....	63.9	31.6	53.0	53.1	55.4	60.1	66.2	58.5	76.9	73.3	88.5	89.3	121.3
All others.....	59.7	84.0	54.7	54.6	45.4	61.1	53.4	69.9	71.2	63.6	89.2	101.9	-----
Days of sickness per beneficiary													
Total ¹	68.9	40.0	49.0	49.1	48.7	56.0	58.4	65.5	69.8	75.8	84.1	89.6	108.5
Male white.....	69.5	38.9	48.1	47.1	48.1	56.4	57.7	65.4	69.5	75.8	84.0	89.4	107.7
Male Negro.....	64.2	77.0	39.6	51.6	44.8	48.2	53.9	65.0	65.3	73.9	81.7	90.1	116.0
Female white.....	69.9	31.6	56.2	56.9	60.3	67.5	72.4	66.1	82.4	82.4	97.8	93.6	121.3
All others.....	65.8	84.0	57.9	55.5	50.3	57.1	60.1	69.3	80.8	79.9	92.1	101.9	-----

¹ Based on a 20-percent sample of beneficiaries. Excludes maternity beneficiaries. A zero indicates that there were no cases in the sample.

² Includes data for a small number of beneficiaries whose age, sex, or race was not reported.

Source: Railroad Retirement Board: Annual Report 1949. Washington, Government Printing Office, 1950, pp. 232, 234.

Table 137.—Beneficiaries under railroad retirement sickness program, average sick spells, days of sickness and benefits per beneficiary, by occupational group, for sickness benefit year 1948-49 ¹

Occupational group	Beneficiaries		Average per beneficiary			
	Number	Per 1,000 qualified employees	Spells of sickness	Days of sickness ²	Daily benefit rate	Amount of benefits
Total.....	151,245	72	1.10	68.9	\$4.14	\$187.60
Office employees, total.....	21,585		1.09	69.6	4.27	195.45
Executives, supervisors, and professionals.....	2,800	26	1.09	70.9	4.47	209.09
Station agents and telegraphers.....	5,010	84	1.09	69.7	4.20	192.36
Clerks and other office employees.....	13,775	62	1.09	69.2	4.26	193.80
Train-and-engine service employees, total.....	35,445		1.10	66.6	4.50	197.11
Engineers and conductors.....	14,460	123	1.10	68.3	4.59	206.86
Firemen, brakemen, switchmen, and hostlers.....	20,985	75	1.10	65.4	4.44	190.39
Gang foremen.....	5,545	94	1.10	68.4	4.35	195.88
Skilled maintenance employees, total.....	29,350		1.11	68.2	4.35	194.39
Skilled way and structures.....	3,405	75	1.08	69.3	4.27	194.81
Skilled shop.....	25,945	128	1.12	68.1	4.36	194.33
Helpers and apprentices.....	11,470	72	1.11	68.4	4.09	183.74
Laborers, total.....	34,120		1.09	72.5	3.66	174.90
All other employees.....	13,730	83	1.09	66.5	3.84	187.66

¹ Based on a 20-percent sample of beneficiaries. Excludes maternity benefits.

² Includes all creditable days of sickness whether waiting-period or compensable.

Source: Railroad Retirement Board: Annual Report 1949. Washington, Government Printing Office, 1950, pp. 59, 60, 235.

Table 138.—Temporary disability insurance under railroad retirement program, January 1949-June 1950

Year and month	Sickness			Maternity		
	First claims received	Weeks compensated ¹	Benefits paid ²	First claims received	Weeks compensated ¹	Benefits paid ²
1949, total.....	100,592	838,175	\$28,551,328	(4)	36,577	\$2,148,000
January-September.....	69,275	607,768	20,029,318	(4)	27,317	1,595,000
October.....	11,152	74,857	3,092,000	(4)	3,200	192,000
November.....	10,518	78,756	3,275,000	(4)	3,143	187,000
December.....	9,647	76,794	3,198,000	(4)	2,917	174,000
1950, total (6 months).....	84,124	380,835	14,400,666	2,054	16,669	1,001,000
January.....	15,350	84,873	3,274,000	341	3,040	180,000
February.....	13,715	58,234	2,336,000	358	2,576	154,000
March.....	16,329	66,787	2,702,000	377	2,849	172,000
April.....	12,436	56,876	2,306,000	296	2,556	153,000
May.....	13,317	59,790	2,454,000	346	2,836	171,000
June.....	12,977	54,275	2,216,000	336	2,812	171,000

¹ Represents number of benefit periods compensated.

² Monthly figures represent gross payments; totals represent gross payment for the last 1 or 2 months of the period covered and net payments for earlier months, adjusted for refunds and for recoveries because of payments under employer liability and other social insurance laws.

³ Represents claims received during July-December only, since comparable data, excluding maternity claims, are not available for earlier months.

⁴ Data not available.

Source: Department of Labor of Employment Security, Division of Program Standards. Temporary Disability Insurance Activities Under State and Railroad Programs. Monthly reports, October 1949-April 1950. (Processed.)

Relation of State Disability Programs to Occupational Health

Interest in the prevention of occupational diseases was stimulated by two kinds of legislation—first, the inclusion of these diseases under workmen's compensation coverage, and second, the expansion of industrial hygiene services made possible by the Social Security Act of 1935.

Unemployment, with resulting loss of wages, may be due to any one of three causes: (1) Disability from causes arising out of the job; (2) lack of employment opportunities; and (3) disability due to causes unrelated to the job. Existing legislation provides a measure of protection to workers who are unemployed for the first two of the above-mentioned causes, through workmen's compensation and unemployment insurance, respectively.

Until very recently, however, there had been no legislative act which would provide any benefits to individuals who were unemployed because of disabilities of nonoccupational origin.

In 1942, Rhode Island became the first State to enact a law providing for compulsory cash sickness insurance. California followed in 1946, New Jersey in 1948, and New York and Washington in 1949. At least a dozen additional States are considering legislation of this type, suggesting that within the next decade a majority of the States will have adopted some form of cash sickness program. While the laws already passed and under consideration differ in many details as to financing, administration and benefits, they all have the same basic purpose, namely, to provide cash benefits to those who are unemployed because of nonoccupational disability. . . .

The growth and spread of this new form of social insurance naturally raises the question of possible effects on the development and practice of occupational medicine. . . .

The laws recently passed in New Jersey and New York limit employee payments to a fixed amount, regardless of claims experience. The New Jersey law, however, specifically mentions that employer contributions will be calculated according to the experience rating after July 1, 1951, and the New York law holds the employer responsible for any costs in excess of those covered by employee contributions. It would seem obvious that employers will wish to keep their premium payments at a minimum and consequently must take added interest in the health of their employees. A well-developed industrial health program, with proper emphasis on the prevention of all types of sickness disability, now appears to be more important than ever before.

If employers are to be liable for increased sickness disability insurance premiums in the event that sickness absenteeism becomes excessive, there will surely be a tendency to select for employment those who may be expected to have the least amount of sickness.

More rigid physical standards may be expected, with preference being shown for the young, white, male applicant. . . .

In spite of the fact that all current programs call for a waiting period of 1 week, i. e., no benefits for any illness of 1 week's duration or less, the availability of benefits for longer absences may influence some employees to make a minimum of effort to return to their jobs following a period of illness. This, of course, is most likely to occur when there is a small differential between the regular wage and the amount paid in sickness benefits. . . .

The problem of certification of disability is a knotty one in any cash sickness disability program, whether it be voluntary or compulsory. Every industrial physician has at some time been faced with the necessity of evaluating disability certificates brought in by employees who have been away from work. . . . There is no solution to this problem except a continuing program to promote mutual respect and understanding between the industrial physician and the private practitioner. . . .

In addition to controversy over the reasonable duration of a period of disability, and over the actual existence of disability, there may be a question as to whether an illness is of occupational or nonoccupational origin. This is a matter of considerable concern to the patient, to his physician and to the employer or his insurance carrier. . . .

Of the five States which have thus far enacted sickness disability laws, all except Rhode Island permit optional voluntary plans if the employees consent and if the benefits equal or exceed those guaranteed by the State plan. Presumably optional voluntary plans will be permitted in other States as they enact their laws. The industrial physician should be sufficiently familiar with both compulsory and voluntary plans to be able to point out to the employer the advantages and disadvantages of both types. In this way he can be helpful in securing maximum benefits per premium dollar and also guide in the selection of a plan best suited to the needs of his particular plant.

Quoted from Goldwater, Leonard J.: "Sickness Disability Insurance Laws in Relation to Occupational Medicine." *Industrial Medicine and Surgery*, 18:473-475 (November) 1949.

Relation of State Disability Programs to Public Health

A central administrative requirement of any program of this type [temporary disability insurance] is to determine when a worker is disabled. This necessitates some system of medical certification of disability in order that the insurance fund will be used only for justified claims. To those concerned with public health and medical administration, the development of such a system of medical certification raises two questions:

1. What type of administrative framework should be used in a State to assure the most effective handling of claims with respect to their medical aspects?

2. How can the disability insurance program be utilized as an instrument for improving the health of the people?

At present, in the two States [California and Rhode Island] in which disability insurance programs are operating, the medical certification procedure is administered entirely by the State agency responsible for the general program. Since disability insurance is developing in this country as an extension of unemployment insurance, the agencies responsible for the latter are in charge. In neither State is the agency of public health significantly involved in the medical administrative process. . . .

The systems of medical certification being followed involve a combination of certification by the private physician and by agency medical officials. In California and Rhode Island, as in most programs abroad, initial responsibility lies with the private doctor, but power of review and final responsibility lies with agency officials. This combined system is probably best from the point of view alike of the patient, the doctor, and the State agency. . . .

Regardless of their efficiency of operation . . . little, if any, advantage has been taken of the existing framework of health administration already available in State and local government, through the agencies of public health. Instead of looking to the existing health agencies of the States for technical assistance, the responsible social insurance agencies have established their own independent medical staffs and undertaken their own relationships with private medical practitioners and institutions. This independence is unfortunate not only because many disabilities for which claims are paid constitute preventable conditions coming under the control of health departments in one way or another, but more important because the State and local public health agencies offer a ready-made system of skilled personnel in the field of health administration. . . .

The general objective of the medical certification system seems to be substantially that which might be pursued by a good commercial insurance company: the desire to protect the fund against abuses and yet to give fair cash awards where they are justified. There appears to be little special interest in what happens to each individual claimant from the point of view of medical care or personal health, and nothing in the administrative procedure is designed to encourage such interest. Some might assert that any effort along these lines would constitute interference with the private practice of medicine, but such a claim would reflect ignorance of well established principles of cooperation between public health administration and private professional practice. . . .

If responsibilities for the medical certification aspects of disability insurance programs were assigned to State and local departments of health, either directly or on a basis of cooperative working agreements, some of the following benefits could be realized. . . . The task of

initial review of the disability certifications by private physicians could be handled by medical personnel already on the health department staff—either full time or part time. . . . The control of communicable and occupational diseases by appropriate divisions of the health department could be facilitated by the prompt reporting of claimants with such conditions. . . . The health education service of the department of health could be utilized to explain to the workers of the State the meaning and mode of operation of the entire program. Disability insurance, moreover, presents a great opportunity to educate workers about the general importance of obtaining proper medical care. . . . As important as any other health opportunity presented by a disability insurance program, is the chance to advise the disabled worker concerning his specific medical needs. . . . A proper system of offering medical advice, however, would not in the least constitute competition with private medical practice, but rather would promote the utilization of such service. . . . The requirement that certain workers claiming disability benefits must present themselves for examination by an agency doctor provides a valuable opportunity for organized case-finding and preventive procedures. . . . Through a health agency, it might be possible to coordinate the medical care aspects of the disability insurance program with the medical services available through State and local welfare departments. . . . An active referral system under the disability insurance program [to the Federal-State vocational rehabilitation program] could facilitate the recovery of certain disabled workers and reduce the drain on the insurance fund.

Quoted from Roemer, Milton I. "Opportunities for Public Health in Disability Insurance Programs." Public Health Reports, 62: 1657-1667 (Nov. 21) 1947.

Statements of the American Medical Association on State Disability Programs

[Editor's note: The following is the section of the 1948 Annual Report of the Board of Trustees of the American Medical Association which discusses cash sickness compensation. No official notice or action was taken concerning this statement at the December 1948 meeting of the AMA House of Delegates.]

The 1946 resolution [requesting that a study of the Rhode Island Cash Sickness Benefits Program be conducted] was brought to the attention of the Council on Medical Service early in 1947, and since that time the Council has followed carefully the developments in regard to this type of legislation throughout the United States. Reports were submitted to the House of Delegates in June 1947, January 1948, and June 1948, as follows:

June 1947: Interest in and legislation concerning insurance against loss of wages during sickness indicate a need for a study of the subject. The Board of Trustees has referred the matter to the Council.

January 1948: The Council continues to follow legislative developments in the various States and has made it a point to maintain a liaison with the Railroad Retirement Board in regard to cash sickness benefits. At the time of the June session the Council reported on the introduction of 32 "cash sickness" bills in the legislatures of 13 States. Since then 11 bills have been added, making a total of 43 bills introduced in 16 State legislatures. These bills generally provide for the establishment of a system of sickness benefits or "health insurance." The growth in interest in this type of legislation is shown by the fact that only 10 bills were introduced in State legislatures in 1935-36, as compared to 39 in 1945 and 43 in 1947.

June 1948: The House of Delegates approved the principle of cash sickness benefits in 1938. Since that time interest in the subject, particularly on the part of State legislatures, has developed rapidly. Fifty proposals for cash sickness and related benefits were introduced in State legislatures in 1947. Of this number, 25 provided for specific cash State funds, with affiliation compulsory. The implications of this type of program warrant serious consideration. The House of Delegates recognized this when it approved a resolution requesting "a complete study of the existing and proposed compulsory temporary disability compensation programs." The resolution was referred to the Council on Medical Service, and since then the staff has followed closely the developments in various States. These developments were reported to the House in June 1947 and in January 1948.

The Council has postponed a detailed study until experience from more than one type of program can be obtained and compared. The Rhode Island (monopolistic) plan has been in operation over 5 years, the California (optional) plan over 1 year and the Railroad Retirement Board (national) plan almost a year. Studies of these three, together with a number of proposed plans, should provide a reasonable appraisal of the subject. A study of the Rhode Island plan has recently been completed by Miss Elizabeth Wilson, and arrangements have been made to have access to the results of the study. Studies of the two other plans will be undertaken in cooperation with the Bureau of Medical Economic Research unless the Council discovers existing studies comparable to that of Miss Wilson. The Council is primarily interested in the medical aspects of cash sickness benefit programs and will make every effort to arrive at definite recommendations.

Quoted from American Medical Association, Board of Trustees "Annual Report." Journal of the American Medical Association, 138:864 (October 30) 1948.

[Editor's note: This subject was not raised at the June and December 1949 meetings of the AMA House of Delegates. The following is the section of the 1950 Interim Report of the AMA Council on Medical Service entitled "Temporary Cash Sickness Benefits Legisla-

tion." This was adopted without discussion at the June 1950 meeting of the House of Delegates.]

In the Council report reference is made to a study of temporary cash sickness benefits legislation by the Council's Correlating Committee on Medical Care for Industrial Workers. The members of this correlating committee are: Drs. William A. Sawyer, chairman; Warren F. Draper, John M. Emmett, Thomas A. McGoldrick, Leo Price, Frederick Slobe, and Harold A. Vonachen. This committee has now reported its recommendations to the Council. After consideration of these recommendations, it is the opinion of the Council that before reporting further on the matter of temporary cash sickness benefits legislation, this subject should be discussed with the State medical associations. In view of this, and with the permission of the House of Delegates, the Council will invite representatives of the State associations to participate in a conference on this subject at the earliest possible date and submit a complete statement to the House of Delegates at its next session.

Quoted from American Medical Association, "Proceedings of the San Francisco Session." Journal of the American Medical Association, 143:991-992 (July 15), 1101-1102 (July 22) 1950.

Comparison of State Temporary Disability Insurance Laws, December 1, 1949

Rhode Island

Name of program: Cash Sickness Compensation.

Type of law: State plan administered by employment security agency in coordination with unemployment insurance.

Name of agency: Department of Employment Security.

Method of insuring: All employers insured with the State fund.

Effective date of contributions: June 1, 1942.

Effective date of benefits: April 1943.

Coverage: Same as for unemployment insurance (four or more workers in 20 weeks) except that individual workers can elect out on religious grounds.

Financing: 1 percent employee contribution, formerly paid for unemployment insurance purposes.

Administrative financing: 6 percent of contributions.

Administrative costs of private plans: No private plans.

Definition of disability: Inability because of physical or mental condition to perform regular or customary work.

Payments for pregnancy: Limitation of 15 weeks benefits for a pregnancy even in two consecutive benefit years, except for unusual complications as a result of childbirth.

Benefit formula: Same as unemployment insurance.

Benefit year: Uniform, beginning first Sunday in April.

Base period: Calendar year preceding benefit year.

Qualifying earnings or employment: \$100 in base period.

Weekly benefit amount: \$10–\$25, based on schedule of high quarter wages.

Duration: 5+ to 26 weeks, \$52–\$650, based on schedule of annual wages. Duration separate from unemployment insurance.

Waiting period: Seven consecutive days of disability in benefit year.

Part weeks of disability: No provisions. Benefits paid only for complete weeks of disability.

Benefit formula for private plans: No provisions for private plans.

Administrative procedures:

Claims: Initial and continued claims to central office by mail.

Medical certification of disability: Medical certification required in connection with all initial claims, and continued claims on request.

Required medical examination: Agency uses panel of physicians to give examinations to claimants directed by the agency to report for such examinations, and pays the physicians a scheduled fee for each case.

California

Name of program: Unemployment Compensation Disability Benefits.

Type of law: State plan, with substitution of private plans permitted; administered by employment security agency in coordination with unemployment insurance.

Name of agency: Employment Stabilization Commission.

Method of insuring: Employers insured with State fund unless and until agency approval given to private plan (insured or self-insured).

Effective date of contributions: May 21, 1946.

Effective date of benefits: December 1, 1946.

Coverage: Same as for unemployment insurance (1 worker and \$100 in a quarterly payroll).

Financing: 1 percent employee contribution, formerly paid for unemployment insurance purposes.

Administrative financing: 5 percent of contributions.

Administrative costs of private plans: Cost attributable to private plans assessed against plans in proportion to covered wages; limit 0.02 percent of wages.

Definition of disability: Inability because of physical or mental condition to perform regular or customary work.

Payments for pregnancy: No payments for any illness or injury caused by or arising in connection with pregnancy up to 4 weeks after termination of pregnancy.

Benefit formula: Same as unemployment insurance.

Benefit year: Individual, beginning with valid claim. Valid claim for either temporary disability or unemployment insurance establishes benefit year for both.

Base period: First four or last five calendar quarters preceding benefit year beginning in second or third month of quarter; first four of last six calendar quarters preceding benefit year beginning in first month of quarter.

Qualifying earnings or employment: $30 \times$ weekly benefit amount or $1\frac{1}{2} \times$ high-quarter wages, whichever is less, but not less than \$300.

Weekly benefit amount: \$10–\$25 based on schedule of high-quarter wages.

Additional benefits: Hospital benefits of \$8 a day for 12 days in benefit year. No waiting period for these benefits, or for regular benefits for hospitalized claimant (effective January 1, 1950).

Duration: 12+ to 26 weeks \$150–\$650 computed as lesser of $26 \times$ weekly benefit amount or one-half base period wages. Duration separate from unemployment insurance.

Waiting period: Seven consecutive days of disability at beginning of each uninterrupted period of disability.

Uninterrupted period of disability: Two consecutive periods of disability due to the same or related cause or condition and separated by not more than 14 days.

Part weeks of disability: Benefits paid for each day of disability in excess of 7 in a spell, at rate of one-seventh of weekly amount.

Benefit formula for private plans: Benefit rights greater than under State plan—rights at least equal in all respects, and greater in at least one.

Administrative procedures:

Claims: Initial claims to central office by mail, continued claims to 16 area offices by mail.

Medical certification of disability: First claims must be signed by a licensed physician, surgeon, dentist, chiropractor, osteopath, chiropractor, by a medical officer of the United States Government, or by authorized California religious practitioner. Continued claims must have similar certification when requested.

Required medical examination: Agency uses panel of physicians to give examination to claimants directed by the agency to report for such examinations, and pays the physicians a scheduled fee for each case.

New Jersey

Name of program: Temporary Disability Benefits, State plan. Employed workers—disability during employment; unemployed workers—disability during unemployment.

Type of law: State plan, with substitution of private plans permitted; administered by employment security agency in coordination with unemployment insurance.

Name of agency: Department of Labor and Industry.

Method of insuring: Employers insured with State fund unless and until agency approval given to private plan (insured or self-insured).

Effective date of contributions: June 1, 1948. (See also, *Financing*, below.)

Effective date of benefits: January 1, 1949.

Coverage: Same as for unemployment insurance (four or more workers in 20 weeks) except that individual workers can elect out on religious grounds.

Financing:

June 1, 1948 to December 31, 1948—0.75 percent employee contribution, out of 1 percent employee contribution formerly paid for unemployment insurance; remaining 0.25 percent for unemployment insurance.

January 1, 1949 and after—Workers covered by State plan pay 0.75 percent for temporary disability insurance and 0.25 percent for unemployment insurance; workers covered by private plan pay 0.25 percent for unemployment insurance to the State; they may pay up to 0.75 percent toward private plan premiums. State plan employers pay 0.25 percent for temporary disability insurance. After July 1, 1951, employer rate modified by experience rating.

Administrative financing: 6 percent of contributions.

Administrative costs of private plans: Costs attributable to private plans assessed against plans in proportion to covered wages; limit 0.02 percent of wages.

Definition of disability: Employed workers—total inability to perform duties of the employment resulting from any accident or sickness not arising out of and in course of employment, or if so, not compensable under workmen's compensation; unemployed workers—total disability to perform any work for remuneration resulting from any accident or sickness not compensable under the workmen's compensation law.

Payments for pregnancy: No payments for any period of disability due to pregnancy, childbirth, miscarriage, or abortion.

Other exclusions: No payments for any period of disability due to wilfully and intentionally self-inflicted injury, or to injuries sustained in the perpetration of a high misdemeanor.

Benefit formula: Employed workers—similar to unemployment insurance; unemployed workers—same as unemployment insurance.

Benefit year: Employed workers—no benefit year, but statutory minimum and maximum benefits in any 12-month period on same basis as for unemployment insurance; unemployed work-

ers—individual, beginning with valid claim. Valid claim for either disability during unemployment or unemployment insurance establishes benefit year for both.

Base period: Employed workers—first four of last five calendar quarters preceding commencement of any period of disability; unemployed workers—first four of last five calendar quarters preceding benefit year.

Qualifying earnings or employment: Employed workers— $30\times$ weekly benefit amount—same except for different base period; unemployed workers— $30\times$ weekly benefit amount.

Weekly benefit amount: \$9–\$22. (For unemployed workers, benefit is based on one twenty-second of high-quarter wages rounded to next higher dollar.)

Duration: Employed workers—10–26 weeks, \$90–\$572, computed as lesser of $26\times$ weekly benefit amount or one-third base period wages. Limit applies to benefits in any 12 consecutive month period. Duration separate from unemployment insurance. Unemployed workers—10–26 weeks, \$90–\$572 computed as lesser of $26\times$ weekly benefit amount or one-third base period wages. Duration under disability and unemployment insurance limited to 150 percent of duration for either program separately.

Waiting period: Employed workers—seven consecutive days of disability at beginning of each period of disability; unemployed workers—seven consecutive days of disability or 1 week of unemployment in benefit year.

Part weeks of disability: Employed workers—benefits paid for each day of disability in excess of seven in a spell at rate of one-seventh of weekly amount; payment for part week rounded to next higher dollar; unemployed workers—payment for part weeks of disability combined with employment paid according to unemployment insurance formula for partial benefits, i. e., weekly amount minus earnings with an allowance of \$3, rounded to next higher dollar.

Benefit formula for private plans: Employed workers—weekly benefits and weeks of benefits at least equal to State plan and eligibility requirements no more restrictive, except that private plans already in existence may continue throughout the period of the present contract.

Administrative procedures:

Claims: Initial and continued claims to central office by mail.

Medical certification of disability: Medical certification required on all initial claims, and on continued claims on request.

Required medical examinations: Employed workers—when requested by Commission, claimant must submit himself at intervals not more often than once a week, for examination by a legally licensed physician or public health nurse designated by Commission; unemployed workers—not specified.

New York

Name of program: Disability Benefits. Employed workers—disability during employment; unemployed workers—disability during unemployment.

Type of law: Private plans, with competitive State fund, special State fund for unemployed workers, administered by State Workmen's Compensation Board which also approves and supervises private plans. System completely separate from unemployment insurance.

Name of agency: Workmen's Compensation Board.

Method of insuring: Employed workers—employers must arrange for benefit payments by purchasing a policy from an insurance company or from the State insurance fund, or by self-insurance; unemployed workers—special State fund established for paying benefits to the unemployed.

Effective date of contributions: Employed workers—July 1, 1950, for permanent contributions. January 1–June 30, 1950, temporary contributions to fund for disabled unemployed; unemployed workers—January 1, 1950.

Effective date of benefits: July 1, 1950.

Coverage: Differs from unemployment insurance. Four or more workers in 30 days—unemployment insurance, 15 days. Excludes maritime and State government services now covered by unemployment insurance. Individual workers can elect out on religious grounds.

Financing: Employed workers—0.5 percent employee contribution, maximum 30 cents weekly; employer to pay any additional costs; unemployed workers—January 1 to June 30, 1950, 0.1 percent on employees and employers, maximum 6 cents each weekly. Additional amounts needed in the future will be assessed against carriers.

Administrative financing: Employed workers—State insurance fund as a carrier, limited to 25 percent of contributions; unemployed workers—no limit; necessary expense assessed against carriers including the State fund in proportion to covered wages.

Administrative costs of private plans: Employed workers—necessary expense attributable to private plans assessed against carriers; no limit—not separated from administration of benefits to the unemployed.

Definition of disability: Employed workers—inability as a result of injury or sickness not arising out of and in the course of an employment, to perform regular duties of his employment or of any other employment his employer offers him at his regular wages; unemployed workers—inability as a result of injury or sickness not arising out of and in the course of an employment to perform duties of any employment for which he is reasonably qualified by training and experience.

Payments for pregnancy: No payments for any period of disability caused by or arising in connection with a pregnancy unless it occurs after return to covered employment for at least two consecutive weeks following termination of pregnancy.

Other exclusions: No payments for any period of disability occasioned by wilful intention of employee to bring about injury or illness to himself or another, or for injury or sickness sustained in perpetration of an illegal act; or for disability due to any act of war occurring after June 30, 1950.

Benefit formula: Completely different from unemployment insurance.

Benefit year: No benefit year; maximum benefits limited in terms of any 52 consecutive weeks.

Base period: None as used in unemployment insurance.

Qualifying earnings or employment: Employed workers—Four or more consecutive weeks of covered employment (or 25 days regular part-time employment) prior to commencement of disability; unemployed workers—two categories of unemployed workers: (1) Earned \$300 in unemployment insurance covered employment during unemployment insurance uniform base period; (2) did not earn unemployment insurance qualifying wages—earned \$13 in covered employment in each of 20 out of the 30 weeks preceding last day worked in covered employment.

Weekly benefit amount: \$10–26 on basis of one-half average weekly wage in last 8 weeks in covered employment prior to commencement of disability. If average is less than \$10, weekly benefit is the average wage.

Duration: Employed workers—13 weeks (uniform in any 52 consecutive weeks, or for any single period of disability), \$130 (or less if weekly benefit less than \$10)—\$338. Duration separate from unemployment insurance. Unemployed workers—13 weeks during any period of disability, \$130 (or less if weekly benefit less than \$10)—\$338. But no benefits payable beyond twenty-sixth week of unemployment.

Waiting period: Employed workers—seven consecutive days of disability at beginning of each uninterrupted period of disability. Unemployed workers—if unemployment insurance claimant, unemployment insurance waiting period; if not qualified for unemployment insurance, seven consecutive days of disability at beginning of each uninterrupted period of disability.

Uninterrupted period of disability: Successive periods of disability caused by the same or related injury or sickness, if separated by less than 3 months.

Part weeks of disability: Employed workers—benefits paid for each day of disability in excess of 7 in a spell; daily benefit to be computed on basis of normal number of work days per week; unemployed workers—regulation to be adopted.

Benefit formula for private plans: Employed workers—weekly benefits and weeks of benefits at least equal to statutory benefits, and eligibility requirements no more restrictive, except that private plans already in existence may continue throughout the period of the present contract, and may be extended by collective bargaining agreement without meeting statutory conditions.

Administrative procedures:

Claims: Law provides for written notice of disability by or on behalf of claimant—employed workers—to the employer; unemployed workers—to Chairman of the Workmen's Compensation Board.

Medical certification of disability: Claimant must be under care of a physician authorized to render medical care under the New York Workmen's Compensation Law. Proof of disability, including physician's statement, must be submitted not later than 20 days after commencement of disability. Subsequent certifications must be submitted on request.

Required medical examination: Claimant may be required by employer, carrier, or Chairman of Workmen's Compensation Board to submit to examinations by designated physician not more than once a week.

Washington¹

Name of program: Disability Compensation.

Type of law: State plan, with substitution of private plans permitted; administered by employment security agency in coordination with unemployment insurance.

Name of agency: Employment Security Department.

Method of insuring: Employers insured with State fund unless and until agency approval given to private plan (insured or self-insured).

Effective date of contributions: 30 days following approval of law by electorate at 1950 general election, i. e., December 7, 1950. Contributions were to begin July 1, 1949; benefits, January 1, 1950.

Coverage: Same as for unemployment insurance (one worker at any time) except that individual workers can elect out on religious grounds.

Financing: 1 percent employee contribution.

Administrative financing: 6 percent of contributions.

¹ The Washington law will not go into effect since it failed to receive a favorable vote in the referendum at the general election in November 1950.

Administrative costs of private plans: Costs attributable to private plans assessed against plans in proportion to covered wages; limit 0.02 percent of wages.

Definition of disability: Inability because of physical or mental condition due to illness or injury to perform regular or customary work.

Payments for pregnancy: No payments for any illness or injury caused by or arising in connection with pregnancy, up to 4 weeks after termination of the pregnancy.

Other exclusions: No payments for any period of disability due to wilfully and intentionally self-inflicted injury, or to disability occasioned while perpetrating a felony.

Benefit formula: Same as unemployment insurance.

Benefit year: Uniform beginning with the first full calendar week in July.

Base period: Calendar year preceding benefit year.

Qualifying earnings or employment: \$600 in base period.

Weekly benefit amount: \$10-\$25, based on schedule of annual earnings.

Duration: 15-26 weeks, \$150-\$600, based on schedule of base period wages. Duration separate from unemployment insurance.

Waiting period: Seven consecutive days of disability at beginning of each period of disability; but when unemployment immediately precedes a disability which lasts 7 days, and unemployment insurance waiting period or benefit credit could have been given, but for his disability, that unemployment can be credited towards the disability waiting period.

Uninterrupted period of disability: Successive periods of disability due to the same or related causes and separated by not more than 3 weeks.

Part weeks of disability: Benefits paid for each day of disability in excess of 7 in a spell, at rate of one-seventh of weekly amount; payment for part week rounded to next higher dollar.

Benefit formula for private plans: Benefit rights at least equal to State plan.

Administrative procedures:

Claims: Law provides for claims to be filed in accordance with regulations.

Medical certification of disability: Claimant must be under care of a legally licensed physician or surgeon, or dentist acting within the scope of his practice.

Required medical examination: Claimant may be required to submit to examination by designated physician.

Quoted from Department of Labor, Bureau of Employment Security: Unemployment Insurance Program Letter No. 186 (Jan. 17), 1950.

Table 139.—Temporary disability insurance activities under State programs, January 1949—June 1950

Year and month	California						New Jersey State plan ¹			Rhode Island State plan			
	State plan			Private plan, first claims received ¹	First claims received	Weeks compensated	Benefits paid	First claims received	Weeks compensated	Benefits paid	First claims received	Weeks compensated	Benefits paid
	First claims received	Weeks compensated	Benefits paid										
1949, total	140,374	1,024,860	\$23,379,841	98,626	36,619	171,092	\$3,418,458	32,545	280,905	\$5,428,847	22,875	174,464	3,498,003
January-August	96,622	689,377	16,714,657	65,488	25,069	100,053	1,997,890	22,875	174,464	3,498,003	22,875	174,464	3,498,003
September	10,977	84,121	1,018,694	8,233	2,819	18,305	364,000	2,531	23,562	533,800	2,531	23,562	533,800
October	11,066	81,346	1,856,859	7,372	3,098	18,339	364,883	2,531	20,803	461,804	2,531	20,803	461,804
November	11,526	84,402	1,828,530	9,338	2,843	16,688	335,805	2,240	21,863	472,922	2,240	21,863	472,922
December	10,193	83,614	1,969,971	8,185	2,792	17,727	384,171	2,878	20,713	460,518	2,878	20,713	460,518
1950, total (6 months):	80,822	542,550	12,361,974	62,305	21,809	127,712	2,563,698	24,108	145,929	3,201,203	24,108	145,929	3,201,203
Basic benefits	• 28,930	• 177,172	1,417,376										
Additional hospital benefits ²													
January:	12,961	85,677	1,956,305	8,075	3,607	20,830	414,187	2,810	21,237	473,850	2,810	21,237	473,850
Basic benefits	1,473	10,939	87,512										
Additional hospital benefits													
February:	13,715	79,687	1,817,822	8,790	3,237	16,778	340,888	2,643	19,839	443,332	2,643	19,839	443,332
Basic benefits	4,243	28,967	231,736										
Additional hospital benefits													
March:	14,444	100,374	2,319,244	13,001	4,405	22,868	455,302	3,339	24,157	540,323	3,339	24,157	540,323
Basic benefits	5,966	39,113	312,904										
Additional hospital benefits													
April:	12,723	86,464	1,956,022	10,580	3,707	20,211	406,711	• 9,287	20,685	457,008	• 9,287	20,685	457,008
Basic benefits	5,040	32,513	260,104										
Additional hospital benefits													
May:	13,767	97,252	2,193,463	10,970	3,655	25,198	499,942	• 2,876	29,514	632,304	• 2,876	29,514	632,304
Basic benefits	6,149	33,190	265,620										
Additional hospital benefits													
June:	13,212	98,065	2,119,118	10,889	3,198	21,827	497,687	• 3,183	30,497	654,585	• 3,183	30,497	654,585
Basic benefits	5,060	32,450	259,600										
Additional hospital benefits													

¹ Data on weeks compensated and benefits paid are not available.
² Data on private plan are not available.
³ Payment of additional hospital benefits began Jan. 1, 1950.
⁴ Represents number of payments made.
⁵ Days included under basic benefits for which additional hospitalization benefits were paid.
⁶ Represents weeks ended in the month.

Source: Department of Labor, Bureau of Employment Security, Division of Program Standards: Temporary Disability Insurance Activities Under State and Railroad Programs. Monthly reports, August 1949-April 1950. Processed.

Sick-Leave Provisions for Federal and State Employees

The Federal Government and many State and local governments have sick-leave provisions for their employees. A study of sick and annual leave for Federal employees shows that in September 1947, 1,703,540 employees, about 80 percent of the employees in the executive branch of the Government, were subject to sick-leave regulations. Each employee is allowed 15 days of sick leave a year. Unused sick leave may be accumulated, up to a maximum of 90 days. Sick leave taken in the first 9 months of 1947 averaged 5.9 days per employee and was estimated to have cost the Government \$110,000,000 in salaries. The corresponding costs for 1948 may be \$115,000,000.

No comparable data are available for State and local employees. It has been estimated that 65 to 75 percent of State employees have some sick-leave provisions. The Municipal Year Book shows that, among municipal employees of cities with 10,000 or more inhabitants, 63 percent are in communities that have sick-leave provisions for all their employees and 14 percent in communities that have provisions for some of their employees. Sick-leave provisions are probably less common for employees of smaller cities and counties. All in all, some 2.2 million State and local employees are entitled to sick leave. Some sick-leave provisions are very limited—3 days, for example—while some are very liberal; some allow accumulation of unused leave from year to year. Often a teacher on sick leave must pay the salary of a substitute. Sick-leave payments to State and local employees may not be much higher than the Federal, about \$125,000,000.

Quoted from Sanders, Barkev S.: In a volume dealing with employment and wages, prepared for the Twentieth Century Fund by W. S. Woytinsky and Associates, to be published in 1951.

Vocational Rehabilitation Program

Services Provided and Case Load

All men and women of or near working age with substantial job handicaps in the form of physical or mental impairments are eligible for vocational rehabilitation services. Unemployment is not a prerequisite; a disabled person (at or near working age) may be eligible under the program if he is in employment which, because of his disability, endangers his health or safety or the health or safety of others, or if his employment is unsuitable in other ways, or if he is in danger of losing his job through disability. Before any rehabilitation services can be provided, however, it must be determined that the disabled man or woman has a reasonable chance of being suitably employed.

The State-Federal system of vocational rehabilitation operates in all the States, the District of Columbia, Hawaii, and Puerto Rico. Territorial funds were lacking to carry out Alaska's approved plan of operation during the past year. . . .

Through the program of vocational rehabilitation, disabled men and women are transformed from helplessness to competence; from dependency to self-sufficiency; from hopelessness to active participating and contributing membership in our economy and society.

The past year brought the total of completed rehabilitations for 6 years to 277,059 disabled persons compared with 210,125 for the preceding 23 years of program operations. This means a yearly average of 46,176 rehabilitations since 1943 as against 9,136 for the preceding period. The 277,059 disabled persons during the last 6 years increased their earnings, through rehabilitation, by more than 1 billion dollars.

Quoted from Annual Report of the Federal Security Agency, 1949: Office of Vocational Rehabilitation. Washington, Government Printing Office, 1950, pages 2-3.

All of the 58,020 individuals rehabilitated [by State-Federal vocational rehabilitation programs] in 1949 received guidance, counseling, and placement. About 29 percent of the group required no other additional services except examinations. Thirty-eight percent of the group required only some type of physical restoration service in addition to guidance and placement, while 23 percent required only guidance, placement, and training. About 5 percent required training, physical restoration, guidance, and placement before they were rehabilitated. A relatively larger number of 1949 rehabilitants than of 1948 required physical restoration services to complete their rehabilitation, while the number who required vocational training in 1949 decreased relatively from the number training in 1948. . . .

Seventy-five percent were unemployed at the time rehabilitation was started and 3 percent were farmers or family workers whose incomes were not reported. The annual earnings of the 22 percent who were wage earners were estimated to be at the rate of \$17,000,000. However, some of the persons who were working at the time rehabilitation services started were not able to live on their earnings and were receiving public or private assistance. Some of them were either in danger of losing their jobs because of their disabilities, or were in temporary or part-time jobs, or were in jobs which constituted hazards to themselves or their fellow workers, or were otherwise unsuitably employed.

After rehabilitation, 87 percent of the 58,020 persons were in jobs from which they were earning at the annual rate of \$93,000,000. Of the remaining 13 percent whose earnings were not included in the \$93,000,000 figure, the earnings of 7,728 farmers or family workers were not estimated and the wages of the other 170 rehabilitants were not reported.

The \$93,000,000 represents purchasing power in every community in the Nation, most of which resulted from the services provided by the State agencies. It is estimated that the Federal income tax liability on the \$93,000,000 will return to the Federal Government about 5.5 million dollars in 1 year. The 1949 expenditures by the Federal Government to the State agencies amounted to \$18,215,683.

If the 1949 rehabilitants continue to have a Federal income tax liability which is at least equal to that for the first year after rehabilitation, it will take only a few years for the 1949 rehabilitants to return to the Federal Government the entire amount expended for their rehabilitation.

Quoted from Federal Security Agency, Office of Vocational Rehabilitation: Rehabilitation, 1949 (Administrative Service Series No. 57). The Agency (March 16) 1950, pp. 2-3.

Table 140.—Total vocational rehabilitation case load, by State and agency, 1949

[Corrected to Sept. 1, 1949]

Agency ¹	Total	Number closed during fiscal year 1949					Number on rolls on June 30, 1949	
		From active case roll				From referred status ⁴	Active case roll ⁵	In referred status ⁶
		Employed (rehabilitated)	Unemployed ²	Transferred to other agency	Other reasons ³			
Total.....	372,344	58,020	3,444	742	21,076	59,497	133,714	95,851
Alabama.....	10,380	1,675	153	11	384	362	4,127	3,668
Arizona.....	1,379	188	10	4	38	218	419	502
Arkansas.....	6,128	756	23	7	403	1,322	2,016	1,601
California.....	34,020	5,004	338	48	1,575	6,164	11,239	9,652
Colorado:								
General.....	2,499	393	5	39	153	667	792	450
Blind.....	312	24	0	0	9	143	61	75
Connecticut:								
General.....	5,571	1,054	133	27	385	413	2,785	774
Blind.....	252	62	23	4	2	28	91	42
Delaware:								
General.....	1,816	410	22	8	235	312	724	105
Blind.....	131	26	23	2	12	14	50	4
District of Columbia.....	2,470	404	97	12	247	414	1,117	179
Florida:								
General.....	8,652	1,655	115	27	178	1,970	3,309	1,398
Blind.....	2,520	209	34	9	43	852	691	682
Georgia.....	28,699	3,075	73	20	3,870	2,289	6,355	13,017
Hawaii:								
General.....	2,058	146	23	4	19	324	568	974
Blind.....	436	31	0	3	48	238	73	43
Idaho:								
General.....	1,124	116	1	5	13	268	216	505
Blind.....	118	7	1	1	7	8	50	44
Illinois.....	12,582	3,513	107	13	750	1,278	5,672	1,249
Indiana:								
General.....	5,367	848	72	22	177	374	3,170	704
Blind.....	518	127	11	1	34	35	274	36
Iowa:								
General.....	4,594	695	25	0	403	634	1,856	981
Blind.....	239	30	1	0	6	103	73	26
Kansas:								
General.....	3,325	655	24	12	152	638	1,091	753
Blind.....	284	38	0	3	22	41	107	73
Kentucky.....	6,115	859	7	3	121	413	1,580	3,132
Louisiana:								
General.....	5,581	1,200	26	24	286	619	2,670	756
Blind.....	789	65	9	1	15	72	284	343
Maine:								
General.....	1,683	261	14	1	45	320	577	465
Blind.....	130	15	2	0	9	35	52	17
Maryland.....	5,108	837	62	25	354	500	2,495	835
Massachusetts.....	4,202	561	45	4	166	679	1,398	1,349
Michigan:								
General.....	21,768	4,383	432	60	469	2,857	9,247	4,320
Blind.....	920	171	48	6	105	131	366	93
Minnesota:								
General.....	5,293	595	55	3	245	756	2,467	1,172
Blind.....	718	125	0	1	37	183	270	102
Mississippi:								
General.....	6,299	941	75	7	292	1,954	1,384	1,646
Blind.....	737	81	19	2	43	92	401	99
Missouri:								
General.....	5,722	1,012	27	3	107	874	2,365	1,334
Blind.....	747	125	32	4	26	90	365	105
Montana:								
General.....	2,204	343	12	5	33	551	791	469
Blind.....	203	10	1	2	26	51	44	69
Nebraska:								
General.....	1,830	408	17	5	17	257	832	294
Blind.....	354	33	0	0	7	82	103	129
Nevada.....	299	40	0	0	48	42	145	24
New Hampshire:								
General.....	640	86	3	12	49	109	220	161
Blind.....	83	12	0	0	4	14	36	17
New Jersey:								
General.....	4,836	1,141	49	23	185	603	2,237	598
Blind.....	949	104	54	3	64	306	378	40

See footnotes at end of table.

Table 140.—Total vocational rehabilitation case load, by State and agency, 1949—Continued

[Corrected to Sept. 1, 1949]

Agency ¹	Total	Number closed during fiscal year 1949				Number on rolls on June 30, 1949		
		From active case roll				From referred status ⁴	Active case roll ⁵	In referred status ⁶
		Employed (rehabilitated)	Unemployed ³	Transferred to other agency	Other reasons ⁷			
New Mexico:								
General.....	1,363	165	12	6	79	487	345	269
Blind.....	141	16	2	1	7	11	61	43
New York:								
General.....	18,857	3,042	339	12	2,367	3,174	7,635	2,288
Blind.....	1,276	206	0	17	74	76	547	356
North Carolina:								
General.....	9,907	2,259	43	3	680	930	4,170	1,822
Blind.....	1,933	279	7	4	12	887	628	116
North Dakota:	1,471	193	6	2	55	175	403	637
Ohio:								
General.....	6,055	1,088	55	20	328	921	2,501	1,142
Blind.....	1,616	200	43	19	103	368	568	285
Oklahoma:	5,921	1,000	18	18	379	500	2,979	1,027
Oregon:								
General.....	4,673	442	23	3	155	958	1,442	1,650
Blind.....	370	44	2	3	28	50	113	130
Pennsylvania:								
General.....	22,194	2,656	63	29	1,770	5,615	6,089	5,972
Blind.....	4,552	167	5	5	30	812	1,068	2,462
Puerto Rico:	4,190	567	26	0	191	533	1,259	1,614
Rhode Island:								
General.....	1,527	200	29	2	45	355	687	209
Blind.....	119	20	0	2	5	3	81	8
South Carolina:								
General.....	7,345	1,742	46	16	125	876	2,835	1,705
Blind.....	526	85	1	4	68	112	173	93
South Dakota:								
General.....	630	90	0	3	5	65	297	170
Blind.....	114	24	0	0	3	20	46	21
Tennessee:								
General.....	8,186	1,461	44	11	319	1,628	2,484	2,239
Blind.....	957	56	16	2	19	149	411	304
Texas:								
General.....	14,374	2,001	50	17	290	1,633	5,759	4,624
Blind.....	2,735	207	13	7	85	540	559	1,324
Utah:	2,242	361	5	6	56	398	977	439
Vermont:								
General.....	1,009	155	14	0	37	225	362	216
Blind.....	145	14	0	0	6	10	68	47
Virginia:								
General.....	8,373	1,155	25	21	715	1,439	3,023	1,995
Blind.....	328	38	41	4	4	140	57	44
Washington:								
General.....	4,599	633	52	8	144	616	1,602	1,544
Blind.....	256	51	7	3	21	17	113	44
West Virginia:	13,135	1,556	46	4	776	3,647	3,218	3,888
Wisconsin:								
General.....	6,666	1,104	101	5	150	825	3,156	1,325
Blind.....	354	40	2	1	19	93	70	129
Wyoming:	1,521	154	5	5	18	510	265	564

¹ In States which have 2 agencies, the agency under the State board of vocational education is designated as "general," and the agency under the State commission or other agency for the blind is designated as "blind."

³ Closed after rehabilitation plan was agreed upon and approved by supervising official; received rehabilitation service but never reached the point of employment because of personal factors, illness, aggravated disability, etc.

⁴ Closed following acceptance during process of counseling or prior to initiation of rehabilitation plan, because of indifference of client, probable increase in degree of disability of client, loss of contact with client, etc.

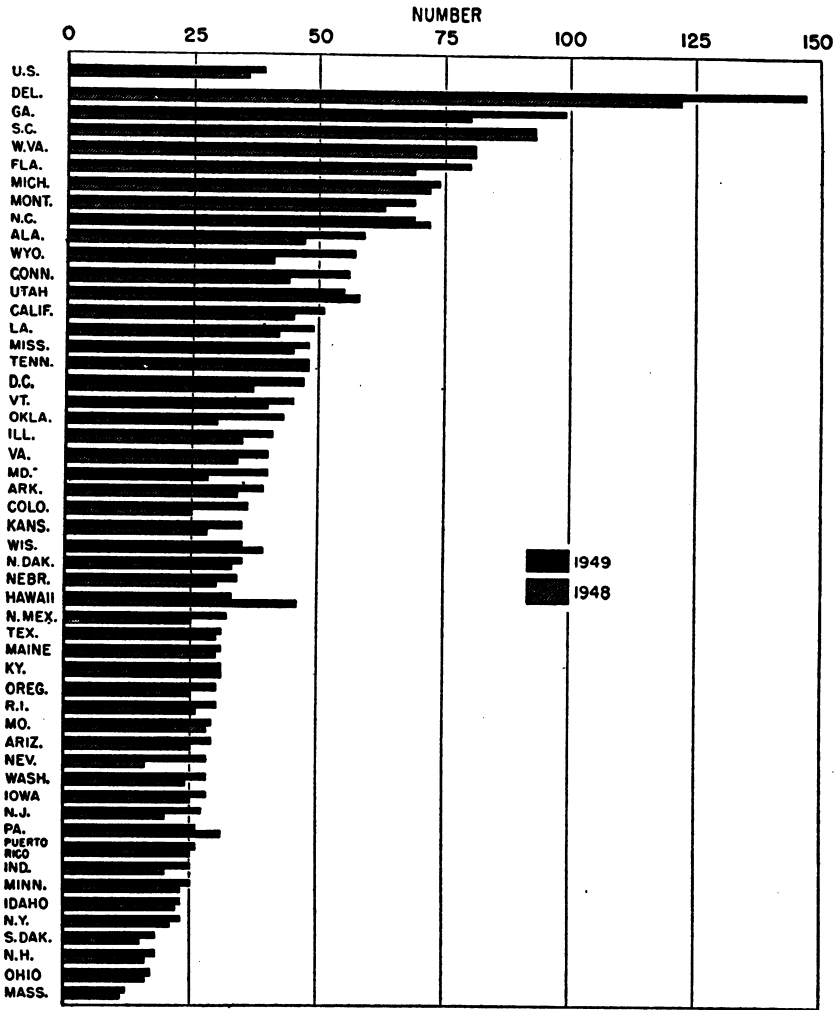
⁵ In process of rehabilitation on June 30, 1949.

⁶ Service declined, services not needed, individual not eligible, individual not sufficiently cooperative to make rehabilitation possible, individual needing services other than vocational rehabilitation, referred to other agencies, migratory shifting of the individual.

⁷ Eligibility for rehabilitation not determined.

Source: Annual Report of the Federal Security Agency, 1949; Office of Vocational Rehabilitation. Washington, Government Printing Office, 1950, pp. 35-36.

Number of persons rehabilitated per 100,000 civilian population



Source: Annual report of the Federal Security Agency, 1949: Office of Vocational Rehabilitation. Washington, Government Printing Office, 1950, page 24.

FIGURE 15.

Expenditures and Savings

The 53,000 disabled men and women rehabilitated in 1948 increased their annual rate of earnings from \$17,000,000¹ to \$86,000,000 after rehabilitation—a net gain of \$69,000,000 in the Nation's purchasing power in the first year of rehabilitation.² After rehabilitation, these 53,000 men and women were paying Federal income taxes at the rate of \$5,000,000 a year. They also paid community, State, and other taxes which have not been computed.³

In the first 5 years of operations under strengthened legislation the State-Federal system rehabilitated 220,000 disabled men and women into successful employment. In the preceding 23 years under limited legislative authority and support, the system rehabilitated 210,000 disabled men and women. These 220,000 disabled men and women rehabilitated into successful employment during the first 5 years under the new law have already increased their earnings and the Nation's purchasing power by \$900,000,000, have already paid Federal income taxes of \$70,000,000 plus State, community, and other taxes and they will continue to earn—continue to pay taxes. In tax receipts alone vocational rehabilitation is proving to be a sound investment. For every \$1 spent by the Federal Government on his rehabilitation the average disabled man or woman will pay \$10 in Federal income taxes. To do this he must be employed for only 85 percent of his work-life expectancy. He must maintain only his initial, post-rehabilitation rate of earnings. He is 31 years old, with 34 years of work-life ahead. Most rehabilitants increase their earnings as they grow more proficient in their jobs.

Quoted from Federal Security Agency, Office of Vocational Rehabilitation: *Brass Tacks: Vocational Rehabilitation for Civilians*. The Agency (June 15) 1949.

¹ Twenty-three percent were earning wages when they started rehabilitation, but were in unsafe or unsuitable employment, or in part-time or temporary jobs, or were in danger of losing their jobs because of disability.

² These figures do not include the earnings of 6,157 farmers and family workers, which were not estimated.

³ Estimate based on rate of earnings at completion of rehabilitation. Federal income tax calculated by procedures prescribed in standard forms of Bureau of Internal Revenue.

Non-Governmental Agency Programs

Programs of Professional, Industrial, Research, and Educational Agencies

Professional Societies

Much, however, was accomplished by a number of voluntary organizations and scientific and professional associations. Foremost in this group promoting industrial health have been the National Safety Council, the American Association of Industrial Physicians and Surgeons, and the American Industrial Hygiene Association. These last two groups carried the banner for industrial health when many doubters and opposers stood on the side lines. The high standards of industrial medicine and hygiene were made possible by the character and professional strength of the men making up these two organizations.

More recently several professional organizations have had a leading hand in carrying forward this program. One of these is the American College of Surgeons, which organized its Committee on Industrial Medicine and Traumatic Surgery in 1926. This committee has done excellent work in setting minimum standards for medical services in industry, in surveying the medical departments of industrial plants and accrediting those that measure up to their standards. Another is the Council on Industrial Health formed by the American Medical Association in 1937. This council has had a strong influence on the continued development in industrial medicine through its Annual Congress on Industrial Health, through its exhibits, and through influencing the State and local medical societies to appoint committees and helping them develop programs on industrial medicine and health. Postgraduate and undergraduate industrial medical education are also being stressed by this council. . . .

Quoted from Wampler, Fred J.: *The Principles and Practices of Industrial Medicine*. Baltimore, The Williams & Wilkins Co., 1943, page 5.

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION.—This association is approximately 8 years old and has more than 400 members. In addition to the national society, there are a dozen local sections. The object of this association is to increase the knowledge of industrial hygiene through interchange and dissemination of information; to promote the study and control of environmental factors affecting the health and well-being of industrial workers; to correlate such activities; and to bring together persons interested in the various phases of industrial hygiene.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS.—This society, which has been in existence for the past 10 years, has as its major objectives the promotion of all phases of industrial hygiene and sanitation and the coordination of these activities in official agencies. The organization also has for a further objective the encouragement of the interchange of experience among industrial hygiene personnel in official organizations, and the collection and dissemination of information which may be of assistance in the proper fulfillment of their duties.

This organization, which numbers approximately 300 members . . . is primarily concerned with the proper administration of responsibilities given to the agencies by legislative fiat or other decrees.

Quoted from American Public Health Association, Industrial Hygiene Section: "Report of the Committee on Inter-Society Cooperation." *American Journal of Public Health*, 40: Yearbook 144-145 (May, Part II) 1950.

STATE MEDICAL SOCIETY COMMITTEES ON INDUSTRIAL HEALTH.—

1. To train industry and labor to the value of industrial health conservation.

2. To develop a clear understanding of the proper scope and functions of industrial medicine and to clarify relationships between private and industrial practice.

3. To keep the medical profession informed about all accepted methods for reducing the frequency and severity of industrially induced disability.

4. To elevate medical relations under workmen's compensation.

5. To scrutinize all legislation affecting the health of industrial workers.

6. To improve relationships between medicine and insurance.

7. To establish working relationships with all agencies in the State interested in industrial health.

8. To arrange for the adoption of similar activities through cooperating committees in the medical societies of the industrial counties.

Quoted from American Medical Association Council on Industrial Health: "Medical Service in Industry." *The Journal of the American Medical Association*, 115: 1099-1100 (Sept. 28) 1940.

Industrial Associations

Industry, too, has been very active in the field of industrial health and of late has contributed much to the preventive phases of this problem. The National Association of Manufacturers has had a Committee on Healthful Working Conditions for several years. This committee is especially interested in bringing industrial hygiene programs to the small plants which are in no position to carry on such a program of their own accord. Among the trade associations, the work of the American Foundrymen's Association is noteworthy. This particular agency has been active in the development of good practice codes in the foundry industry, and in the collection of data for the purpose of developing information whereby the objectives of the various codes may be achieved.

Nearly all of the insurance companies, especially those that act as compensation carriers, maintain industrial hygiene personnel and laboratories for the study of existing health hazards and the means for controlling these hazards. Of recent years one or two of the more aggressive labor unions have increased their efforts to promote health among their members. . . .

The Industrial Hygiene Foundation of America, Inc., has done much for the advancement of industrial health through the study of the occupational diseases. One of the valuable activities of the foundation is the distribution of bulletins on the medical, engineering, and legal phases of industrial hygiene, and the publication of reviews, abstracts, and bibliographies on matters pertaining to industrial health. The foundation, in cooperation with the United States Public Health Service, has also been active in promoting the study of sick absenteeism among its member companies. . . .

Such agencies as the American College of Surgeons, the National Industrial Conference Board, the National Safety Council, the American Standards Association, the American Society of Heating and Ventilating Engineers, the Illuminating Engineering Society, the National Tuberculosis Association, the American Social Hygiene Association, the Saranac Laboratory for the Study of Tuberculosis, and others, are all taking a deep interest in the subject and have contributed valuable information in their respective fields.

Quoted from Bloomfield, J. J.: "Available Services in Industrial Hygiene." *Manual of Industrial Hygiene* (Edited by William M. Gafar). Philadelphia, W. B. Saunders Co., 1943, pages 123-124.

Research and Educational Institutions

Those colleges that had given any organized instruction in industrial hygiene prior to 1940 now provided short courses for greatly expanded classes in an effort to give a large number of interested persons sufficient knowledge to make them useful workers in the field during war-expanded production. During and following this period many medical schools set up short courses in industrial medicine and hygiene as orientation and refresher courses. A few institutions of advanced learning have provided special instruction in health and safety. The present plans include advanced training and education leading to degrees in health and safety engineering, but the opportunities for advanced instruction for chemists, physicists, mechanical engineers, and others who wish to prepare themselves for industrial hygiene engineering are still discouragingly inadequate.

A recent report of the Committee on Professional Education of the American Public Health Association lists Columbia, Harvard, Johns Hopkins, Toronto, Yale, and the State universities of California, Michigan, Minnesota, and North Carolina among the institutions accredited to give the degree of master of public health for the academic year 1946-47. This report recognizes the basic sciences underlying public health practices, including industrial hygiene. Therefore,

all graduates of these schools presumably will have received at least a good orientation course in industrial hygiene; some may have an opportunity to prepare for later specialization in it. . . .

Much research into the toxicity of materials and into methods of analysis and control of harmful exposures was conducted during the war by the United States Public Health Service, and some by industry. Several industries, seeing the need for such research, made plans to enter the field following the return to peacetime activities. The need for research into the effects of many uncharted forms of air pollution is great. Such work can never expect to keep pace with the manufacturing chemist and the even faster moving physicist, but we can follow more closely than has been done in the past.

Quoted from Patty, Frank A.: "Industrial Hygiene—Retrospect and Prospect." *Industrial Hygiene and Toxicology*, volume 1. New York, Interscience Publishers, Inc., 1948, pages 11-12.

Table 139.—Temporary disability insurance activities under State programs, January 1949–June 1950

Year and month	California			New Jersey State plan ¹			Rhode Island State plan			
	State plan			Private plan, first claims received ¹	First claims received	Weeks compensated	Benefits paid	First claims received	Weeks compensated	Benefits paid
	First claims received	Weeks compensated	Benefits paid							
1949, total.....	140,374	1,024,860	\$23,379,641	98,626	36,619	171,092	\$3,418,468	32,545	260,905	\$6,426,547
January-August.....	96,622	689,377	15,714,657	65,468	25,069	100,053	1,997,839	22,375	174,464	3,696,003
September.....	10,977	84,121	1,918,694	8,233	2,819	18,305	1,366,000	2,521	23,562	523,900
October.....	11,066	81,346	1,853,489	7,372	3,066	18,339	364,883	2,531	20,903	461,904
November.....	11,526	84,402	1,929,830	9,338	2,843	16,668	335,805	2,240	21,363	472,922
December.....	10,193	85,614	1,959,971	8,195	2,792	17,727	354,171	2,878	20,713	460,618
1950, total (6 months):	80,822	542,550	12,361,974	62,305	21,809	127,712	2,553,698	24,108	145,929	3,201,203
Basic benefits.....	426,930	1,177,172	1,417,376							
Additional hospital benefits ¹	12,961	85,677	1,946,305	8,075	3,607	20,830	414,157	2,810	21,237	473,650
January.....	1,473	10,939	87,512							
February.....	13,715	79,687	1,817,822	8,790	3,237	16,778	340,898	2,643	19,839	443,332
March.....	4,242	28,967	231,786							
April.....	14,444	100,374	2,319,244	13,001	4,405	22,868	455,302	3,339	24,157	540,323
May.....	5,966	39,113	312,904							
June.....	12,723	86,464	1,956,022	10,580	3,707	20,211	406,711	9,287	20,685	457,008
July.....	5,040	32,513	280,104							
August.....	13,767	97,252	2,193,453	10,970	3,655	25,186	499,942	9,876	29,514	632,304
September.....	5,149	33,190	295,520							
October.....	13,212	93,095	2,119,118	10,889	3,198	21,827	437,687	9,153	30,497	654,585
November.....	5,060	32,450	259,600							

¹ Data on weeks compensated and benefits paid are not available.
² Data on private plan are not available.
³ Payment of additional hospital benefits began Jan. 1, 1950.
⁴ Represents number of payments made.
⁵ Days included under basic benefits for which additional hospitalization benefits were paid.
⁶ Represents weeks ended in the month.

Sources: Department of Labor, Bureau of Employment Security, Division of Program Standards: Temporary Disability Insurance Activities Under State and Railroad Programs. Monthly reports, August 1949–April 1950. Processed.

Sick-Leave Provisions for Federal and State Employees

The Federal Government and many State and local governments have sick-leave provisions for their employees. A study of sick and annual leave for Federal employees shows that in September 1947, 1,703,540 employees, about 80 percent of the employees in the executive branch of the Government, were subject to sick-leave regulations. Each employee is allowed 15 days of sick leave a year. Unused sick leave may be accumulated, up to a maximum of 90 days. Sick leave taken in the first 9 months of 1947 averaged 5.9 days per employee and was estimated to have cost the Government \$110,000,000 in salaries. The corresponding costs for 1948 may be \$115,000,000.

No comparable data are available for State and local employees. It has been estimated that 65 to 75 percent of State employees have some sick-leave provisions. The Municipal Year Book shows that, among municipal employees of cities with 10,000 or more inhabitants, 63 percent are in communities that have sick-leave provisions for all their employees and 14 percent in communities that have provisions for some of their employees. Sick-leave provisions are probably less common for employees of smaller cities and counties. All in all, some 2.2 million State and local employees are entitled to sick leave. Some sick-leave provisions are very limited—3 days, for example—while some are very liberal; some allow accumulation of unused leave from year to year. Often a teacher on sick leave must pay the salary of a substitute. Sick-leave payments to State and local employees may not be much higher than the Federal, about \$125,000,000.

Quoted from Sanders, Barkev S.: In a volume dealing with employment and wages, prepared for the Twentieth Century Fund by W. S. Woytinsky and Associates, to be published in 1951.

Vocational Rehabilitation Program

Services Provided and Case Load

All men and women of or near working age with substantial job handicaps in the form of physical or mental impairments are eligible for vocational rehabilitation services. Unemployment is not a prerequisite; a disabled person (at or near working age) may be eligible under the program if he is in employment which, because of his disability, endangers his health or safety or the health or safety of others, or if his employment is unsuitable in other ways, or if he is in danger of losing his job through disability. Before any rehabilitation services can be provided, however, it must be determined that the disabled man or woman has a reasonable chance of being suitably employed.

The State-Federal system of vocational rehabilitation operates in all the States, the District of Columbia, Hawaii, and Puerto Rico. Territorial funds were lacking to carry out Alaska's approved plan of operation during the past year. . . .

Through the program of vocational rehabilitation, disabled men and women are transformed from helplessness to competence; from dependency to self-sufficiency; from hopelessness to active participating and contributing membership in our economy and society.

The past year brought the total of completed rehabilitations for 6 years to 277,059 disabled persons compared with 210,125 for the preceding 23 years of program operations. This means a yearly average of 46,176 rehabilitations since 1943 as against 9,136 for the preceding period. The 277,059 disabled persons during the last 6 years increased their earnings, through rehabilitation, by more than 1 billion dollars.

Quoted from Annual Report of the Federal Security Agency, 1949: Office of Vocational Rehabilitation. Washington, Government Printing Office, 1950, pages 2-3.

All of the 58,020 individuals rehabilitated [by State-Federal vocational rehabilitation programs] in 1949 received guidance, counseling, and placement. About 29 percent of the group required no other additional services except examinations. Thirty-eight percent of the group required only some type of physical restoration service in addition to guidance and placement, while 23 percent required only guidance, placement, and training. About 5 percent required training, physical restoration, guidance, and placement before they were rehabilitated. A relatively larger number of 1949 rehabilitants than of 1948 required physical restoration services to complete their rehabilitation, while the number who required vocational training in 1949 decreased relatively from the number training in 1948. . . .

Seventy-five percent were unemployed at the time rehabilitation was started and 3 percent were farmers or family workers whose incomes were not reported. The annual earnings of the 22 percent who were wage earners were estimated to be at the rate of \$17,000,000. However, some of the persons who were working at the time rehabilitation services started were not able to live on their earnings and were receiving public or private assistance. Some of them were either in danger of losing their jobs because of their disabilities, or were in temporary or part-time jobs, or were in jobs which constituted hazards to themselves or their fellow workers, or were otherwise unsuitably employed.

After rehabilitation, 87 percent of the 58,020 persons were in jobs from which they were earning at the annual rate of \$93,000,000. Of the remaining 13 percent whose earnings were not included in the \$93,000,000 figure, the earnings of 7,728 farmers or family workers were not estimated and the wages of the other 170 rehabilitants were not reported.

The \$93,000,000 represents purchasing power in every community in the Nation, most of which resulted from the services provided by the State agencies. It is estimated that the Federal income tax liability on the \$93,000,000 will return to the Federal Government about 5.5 million dollars in 1 year. The 1949 expenditures by the Federal Government to the State agencies amounted to \$18,215,683.

If the 1949 rehabilitants continue to have a Federal income tax liability which is at least equal to that for the first year after rehabilitation, it will take only a few years for the 1949 rehabilitants to return to the Federal Government the entire amount expended for their rehabilitation.

Quoted from Federal Security Agency, Office of Vocational Rehabilitation: Rehabilitation, 1949 (Administrative Service Series No. 57). The Agency (March 16) 1950, pp. 2-3.

Professional and Health Organizations in the Industrial Health Field—Executive Officers and Addresses

Aero Medical Association of the U. S.,
T. H. Sutherland, M. D., Secretary-Treasurer,
214 South State Street,
Marion, Ohio.

American Academy of Compensation
Medicine,
Barnett S. Fox, Executive Secretary,
501 Fifth Avenue,
New York 17, N. Y.

American Academy of Occupational
Medicine,
Leonard J. Goldwater, M. D., Secretary,
c/o Columbia University School of
Public Health,
600 West One Hundred and Sixty-eighth
Street,
New York 32, N. Y.

American Academy of Ophthalmology
and Otolaryngology,
W. B. Benedict, M. D., Executive Secretary-Treasurer,
100 First Avenue Building,
Rochester, Minn.

American Association of Industrial
Dentists,
Francis J. Walters, D. D. S., Secretary,
Room 4068, Federal Security Building,
South,
Washington 25, D. C.

American Association of Industrial
Nurses, Inc.,
Gladys L. Dundore, R. N., Executive
Secretary,
654 Madison Avenue,
New York 21, N. Y.

American Association of Industrial
Physicians and Surgeons,
Edward C. Holmblad, M. D., Managing
Director,
28 East Jackson Boulevard,
Chicago 4, Ill.

American Association of Railway Sur-
geons,
Chester C. Guy, M. D., Secretary,
5800 Stoney Island Avenue,
Chicago 37, Ill.

American Association for the Surgery of
Trauma,
Charles G. Johnston, M. D., Secretary,
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List of References

- American Academy of Occupational Medicine: *Professional Qualifications and Standards of Professional Performance and Facilities*. Undated.
- American Association of Industrial Nurses: *The Industrial Nurse, Her Duties and Responsibilities*, 1949.
- American Association of Industrial Nurses: *Qualifications of an Industrial Nurse*, 1945.
- American Association of Industrial Nurses: *Recommended Qualifications for Industrial Nurses Working Without Nursing Supervision*, 1950.
- American Association of Industrial Physicians and Surgeons: *1949 Directory*.
- American Conference of Governmental Industrial Hygienists: "Report of the Committee on Standardization and Plant Records and Reports." *Transactions of the Eleventh Annual Meeting*, 1949.
- American Dental Association, Committee on Dental Economics: "Dental Service in Industry." *Journal of the American Dental Association*, February 1942.
- American Hospital Association: *Blue Cross Approval Program of the American Hospital Association*, 1946.
- American Journal of Public Health: "Administrative Problems of Industrial Medicine." *The Journal*, October 1947.
- American Medical Association: "Physicians in Industrial Practice." *Journal of the American Medical Association*, March 29, 1941.
- American Medical Association: "Report of the Board of Trustees." *Journal of the American Medical Association*, October 30, 1948.
- American Medical Association: "Report of the Council on Industrial Health." *Journal of the American Medical Association*, June 18, 1949.
- American Medical Association: "Report of the Council on Medical Service." *Journal of the American Medical Association*, July 2, 1949.
- American Medical Association: "Report of the Council on Industrial Health." *Journal of the American Medical Association*, November 5, 1949.
- American Medical Association: "Report of the Council on Medical Service." *Journal of the American Medical Association*, July 15, 1950.
- American Medical Association, Council on Industrial Health: "Industrial Health: A General Statement of Medical Relationships in Industry." *Journal of the American Medical Association*, February 17, 1940.
- American Medical Association, Council on Industrial Health: "Medical Service in Industry." *Journal of the American Medical Association*, September 28, 1940.
- American Medical Association, Council on Industrial Health: "Medical Service in Industry: Industrial Health Examinations." *Journal of the American Medical Association*, June 24, 1944.
- American Medical Association, Council on Industrial Health: "Medical Service in Industry: The Industrial Medical Department." *Journal of the American Medical Association*, July 5, 1941.
- American Medical Association, Council on Industrial Health: "Medical Service in Industry: Outline of Procedure for Physicians in Industry." *Journal of the American Medical Association*, March 14, 1942.
- American Medical Association, Council on Industrial Health: "Medical Service in Industry: Plant Hygiene Studies." *Journal of the American Medical Association*, March 7, 1942.
- American Medical Association, Council on Industrial Health: "Standing Orders for Nurses in Industry." *Journal of the American Medical Association*, August 28, 1943.

- American Mutual Liability Insurance Co.: *Plan for an Industrial Medical Department*, 1946.
- American Public Health Association, Industrial Hygiene Section: "Report of the Committee on Inter-Society Cooperation." *American Journal of Public Health*, May 1950.
- American Public Health Association, Public Health Nursing Section: "Report of the Committee to Study the Duties of Nurses in Industry." *American Journal of Public Health*, July 1943.
- American Public Health Association, Subcommittee on Medical Care: "The Quality of Medical Care in a National Health Program." *American Journal of Public Health*, July 1949.
- American Standards Association: *Price List of American Standards*, August 1, 1946.
- Arling, Leonard: "Recent Experiments in Medical Service for Small Plants." *Occupational Medicine*, March 1947.
- Associated Medical Care Plans: *Enrollment Reports, Blue Shield Plans, First Quarter 1950*, 1950.
- Aston, Edward R.: *The Industrial Dental Program in Pennsylvania*, November 11, 1948.
- Avnet, Helen Hershfield: *Voluntary Medical Insurance in the United States: Major Trends and Current Problems*, 1944.
- Baetjer, Anna M.: *Women in Industry*, 1946.
- Baker, Helen, and Dahl, Dorothy: *Group Health and Sickness Benefit Plans in Collective Bargaining*, 1945.
- Blake, Roland P., Editor: *Industrial Safety*, 1943.
- Bloomfield, J. J.: "Available Services in Industrial Hygiene." *Manual of Industrial Hygiene*, 1943.
- Bloomfield, J. J.: "Development of Industrial Hygiene in the United States." *American Journal of Public Health*, December 1938.
- Bloomfield, J. J.: "Engineering Control of Occupational Diseases." *Public Health Reports*, May 22, 1936.
- Bloomfield, J. J.: "Industrial Health Hazards." *Industrial Safety*, 1943.
- Bloomfield, J. J.: *Industrial Hygiene: A Series of Lectures on Principles and Practices*, 1950.
- Bloomfield, J. J.: *Industrial Hygiene Problems in Bolivia, Peru, and Chile*, 1948.
- Bloomfield, J. J.: "Labor-Management Relationships in Industrial Health Problems." *Journal of the American Medical Association*, June 30, 1945.
- Bloomfield, J. J.: "Methods Employed in the Appraisal and Control of Industrial Health Hazards." *Medical Clinics of North America*, July 1942.
- Bloomfield, J. J., Trasko, V. M., Sayers, R. R., Page, R. T., Peyton, M. F.: *A Preliminary Survey of the Industrial Hygiene Problem in the United States*, 1940.
- Blue Cross Commission: *Blue Cross Enrollment, United States and Territories as of March 31, 1950*, 1950.
- Bordelon, Myrna S.: "Labor and Industrial Hygiene: The Viewpoints of the C. I. O." *What's New in Industrial Hygiene*, July-September 1947.
- Bowden, Witt: "Changes in Modes of Living." *Monthly Labor Review*, July 1950.
- Bradley, W. R. and Hamblin, D. O.: "The Industrial Hygiene Program of the American Cyanamid Company." *American Industrial Hygiene Association Quarterly*, September 1949.
- Brandt, Allen D.: *Industrial Health Engineering*, 1947.
- Brinton, Hugh P., Dreessen, W. C., Trasko, Victoria M.: "Wartime Industrial Medical Services." *Industrial Medicine*, August 1943.
- Brower, F. Beatrice: "Features of Union Health and Welfare Funds." *The Conference Board Management Record*, 1947.

- Brown, Ernest W.: "Recent Developments in the Field of Education in Industrial Medicine." *Southern Medical Journal*, July 1949.
- Brumm, John M.: "Health Programs in Collective Bargaining." *University of Illinois Bulletin*, February 1949.
- Brundage, Dean K.: "An Estimate of the Monetary Value to Industry of Plant Medical and Safety Services." *Public Health Reports*, August 21, 1936.
- Buchan, Ronald Forbes: "Medical Services for Small Industrial Companies." *Occupational Medicine*, April 1948.
- Burke, Frank: "What Organized Labor Wants from Industrial Hygiene." *Industrial Hygiene Newsletter*, July 1950.
- Census, Bureau of the: *Annual Report on the Labor Force 1949*, 1950.
- Census, Bureau of the: *Census of Manufacturers: 1947*, 1950.
- Census, Bureau of the: *Current Population Reports, Labor Force*, April 19, 1950.
- Census, Bureau of the: *1950 Census Enumerated 150.5 Million Persons in the United States*, July 22, 1950.
- Chamber of Commerce of the United States, Health Advisory Committee: *Industrial Health: A Tale of 3 Cities*, 1944.
- Clark, Dean A.: "Criteria for Evaluating Prepayment Plans." *America's Health: A Report to the Nation by the National Health Assembly*, 1949.
- Collins, Selwyn D.: "Sickness Among Industrial Employees in Baltimore in Relation to Weekly Hours of Work, 1941-1943." *The Milbank Memorial Fund Quarterly*, October 1948.
- Collins, Selwyn D.: "Sickness Surveys." *Administrative Medicine—The Nelson Loose-Leaf Medicine*, 1950.
- Commerce, Department of, Office of Business Economics: "The Economy in Adjustment: A Review of 1949." *Survey of Current Business*, February 1950.
- Commerce, Department of: "Basic Data on National Economy." *Survey of Current Business*, July 1950.
- Commerce, Department of: "National Income and Product in the Second Quarter of 1950." *Survey of Current Business*, August 1950.
- Committee to Prepare Mortality and Morbidity Studies on Group Insurance: "Report of the Committee." *Transactions of the Actuarial Society of America*, May 1948.
- Commons, John R., and Andrews, John P.: *Principles of Labor Legislation*, 1916, 2d ed. 1927.
- Cook, Warren A.: "The Industrial Hygiene Engineer." *Proceedings of the Third Annual Congress on Industrial Health, Chicago, January 13-14, 1941*.
- Corson, John J.: *Manpower for Victory*, 1943.
- DallaValle, J. M.: *The Industrial Environment and Its Control*, 1948.
- Davis, Michael M.: *America Organizes Medicine*, 1941.
- Dawson, Marshall: *Problems of Workmen's Compensation Administration in the United States and Canada*, 1940.
- Dearing, W. Palmer: "Medical Service Plans Across the Country." *American Journal of Public Health*, July 1940.
- Dearing, W. Palmer: *Recent Developments in Public Health in the United States*, June 21, 1949.
- Dewhurst, J. Frederick & Associates: *America's Needs & Resources*, 1947.
- Dickinson, Frank G. and Welker, Everett L.: *What is the Leading Cause of Death?* 1948.
- Dodd, Walter F.: *Administration of Workmen's Compensation*, 1936.
- Draper, Warren F.: "The Medical, Health, and Hospital Program of the U. M. W. A. Welfare and Retirement Fund." *Archives of Industrial Hygiene and Occupational Medicine*, September 1950.
- Drinker, Philip: "The Practice of Industrial Hygiene." *American Industrial Hygiene Association Quarterly*, June 1950.

- Dublin, Louis I.: *Causes of Death by Occupation*, 1917.
- Dublin, Louis I., and Loiboff, Philip: *Occupation Hazards and Diagnostic Signs*, 1921.
- Dublin, Louis I., and Vane, Robert J.: "Occupational Mortality Experience of Insured Wage Earners." *Monthly Labor Review*, June 1947.
- Dunning, James M.: "Public Health Aspects of Dental Service in Industry." *Industrial Hygiene Newsletter*, November 1947.
- Dunning, James M.: "Steps in the Initiation of an Industrial Dental Service." *Journal of the American Dental Association*, August 1942.
- Dunning, James M., Walls, R. M., and Lewis, Samuel R.: "Prevalence and Characteristics of Dental Service in Industry." *The Journal of the American Dental Association*, March 1941.
- East, Bion R.: "Industrial Dentistry." *Journal of the American Dental Association*, October 1, 1945.
- Everts, Glenn S.: "Medical Service to Small Industrial Plants: Means for Accomplishment." *Journal of the American Medical Association*, February 25, 1939.
- Ewing, Oscar R.: *The Nation's Health: A Report to the President*, 1948.
- Falk, I. S.; Sanders, Barkev S., and Federman, David: *Disability Among Gainfully Occupied Persons*, 1945.
- Federal Security Agency: *Some Facts About Our Aging Population*, 1950.
- Federal Security Agency, Office of Vocational Rehabilitation: *Annual Report, 1949*, 1950.
- Federal Security Agency, Office of Vocational Rehabilitation: *Brass Tacks: Vocational Rehabilitation for Civilians*, June 15, 1949.
- Federal Security Agency, Office of Vocational Rehabilitation: *Rehabilitation, 1949*, March 16, 1950.
- Felton, Jean Spencer: "Careers in Industrial Hygiene." *Occupational Trends*, May-June 1950.
- Felton, Jean Spencer: "Industrial Medicine Comes of Age." *West Virginia Medical Journal*, September 1948.
- Fillmore, Anna M.: "Part-time Nursing Services to Small Industrial Plants." *Public Health Nursing*, September 1946.
- Flagg, Grace L. and Longmore, T. Wilson: *Trends in Rural and Urban Levels of Living*, 1949.
- Fulton, William J.: "Industrial Medical Potentials—A Time and Job Analysis of Medicine in Industry." *Industrial Medicine*, July 1949.
- Fulton, William J.: "Records—The Seeing Eye of Industrial Medicine." *Industrial Medicine*, January 1944.
- Gafafer, William M.: "Absenteeism." *Manual of Industrial Hygiene*, 1943.
- Gafafer, William M.: *Illness in Industry*, 1946.
- Gafafer, William M.: "Industrial Sickness Absenteeism, Males and Females, 1948, and Males, First and Second Quarters, 1949." *Public Health Reports*, October 28, 1949.
- Gafafer, William M.: "Sick Absenteeism Among a Sample of Member Companies of I-H-F." *Developing Human Resources*, 1949.
- Gafafer, William M., and Sitgreaves, Rosedith: "The Age Factor in Disabling Morbidity, 1940-44: Experience in a Public Utility Company." *Public Health Reports*, December 7, 1945.
- Goldmann, Franz: "Nursing in Health Insurance Plans." *Public Health Nursing*, August 1948.
- Goldmann, Franz: *Voluntary Medical Care Insurance in the United States*, 1948.
- Goldwater, Leonard J.: "Future of Industrial Medicine." *Industrial Medicine*, January 1948.

- Goldwater, Leonard J.: "Sickness Disability Insurance Laws in Relation to Occupational Medicine." *Industrial Medicine and Surgery*, November 1949.
- Gray, Albert S., and Osborn, Stanley H.: "The Integration of Industrial Hygiene and Public Health." *Transactions of the Second Annual Conference of Governmental Industrial Hygienists*, 1939.
- Greenburg, Leonard; Smith, Adelaide Ross; and Mayers, May R.: *Essentials of Health Maintenance in Industrial Plants*, 1942.
- Group Health Insurance, Inc. (New York): *A Health Service Plan*, 1950.
- Grunfel, Judith: In a volume dealing with employment and wages prepared for the Twentieth Century Fund by W. S. Woytinsky and Associates, to be published in 1951.
- Hamilton, Alice: "Forty Years in the Poisonous Trades." *American Industrial Hygiene Association Quarterly*, March 1948.
- Harley, John P.: "Health Progress in the Local Community: Williamsport's Industrial Health Program." *American Economic Security*, June 1949.
- Hatch, Theodore F.: "Expanding Horizons in Industrial Hygiene." *Harvard Public Health Alumni Bulletin*, May 1948.
- Hawley, Paul R.: "Nursing in a Program of Prepaid Medical Care." *The American Journal of Nursing*, August 1948.
- Hayes, Marion: "Regional Shifts in Industry and Population, 1899-1949." *Monthly Labor Review*, July 1950.
- Hayhurst, Emery R.: "The Industrial Hygiene Section, 1914-1934." *American Journal of Public Health*, October 1934.
- Hazlett, T. Lyle: "Industrial Medicine Historical Note." *Introduction to Industrial Medicine*, 1947.
- Heacock, Lyman D.: "Dental Services." *Manual of Industrial Hygiene*, 1943.
- Heacock, Lyman D.: "Dental Relations in Industrial Health Service." *Industrial Medicine*, January 1947.
- Health Insurance Council, Survey Committee: *A Survey of Accident and Health Coverage in the United States*, 1950.
- Hedley, O. F.: "Medical Services." *Manual of Industrial Hygiene*, 1943.
- Hedley, O. F.: "Organization of Plant Medical Department." *Manual of Industrial Hygiene*, 1943.
- Hess, Gaylord R.: "Analysis of Experience of Industry in the Medical Care of Employees—A Compilation." *Bulletin, American College of Surgeons*, September 1948.
- Hess, Gaylord R.: "Basis of Approvals of Medical Services in Industry." *Industrial Medicine*, July 1949.
- Hess, Gaylord R.: *Medical Service in Industry and Workmen's Compensation Laws*, 1946.
- Hoffman, Frederick L.: "The Mortality From Consumption in the Dusty Trades." *Bulletin of the Bureau of Labor*, November 1908.
- Hollingsworth, Helen; Klem, Margaret C.; and Baney, Anna Mae: *Medical Care and Costs in Relation to Family Income*, 1947.
- Holman, Edwin J. and Cooley, George W.: "Voluntary Health Insurance in the United States." *Iowa Law Review*, Winter 1950.
- Hussey, Raymond: In discussion of article by Hemeon, W. C. L.: "Engineering in Industrial Health Education." *Occupational Medicine*, August 1947.
- Industrial Relations Counselors, Inc.: "Company Medical Programs." *Occupational Medicine*, June 1947.
- Interior, Department of, Coal Mines Administration: *A Medical Survey of the Bituminous-Coal Industry*, 1947.
- Janis, Lee and Roemer, Milton I.: "Medical Care Plans for Industrial Workers and Their Relationship to Public Health Programs." *American Journal of Public Health*, September 1948.

- Johnstone, Rutherford T.: *Occupational Medicine and Industrial Hygiene*, 1948.
- Kehoe, Robert A.: "Significance of Industrial Health." *Occupational Medicine*, October-December 1947.
- Kempfer, Homer: *Education for a Long and Useful Life*, 1950.
- Kennedy, James B.: *Beneficiary Features of American Trade Unions*, 1908.
- Kessler, Henry H.: "Social Significance of Industrial Medicine." *Industrial Medicine*, February 1936.
- King, Frances and Feldman, Louis L.: *Office Management for Health Workers*, 1949.
- Klem, Margaret C.: "Is Prepaid Nursing Care Possible?" *American Journal of Nursing*, December 1944.
- Klem, Margaret C.: "Medical and Dental Care in Prepayment Medical Care Organizations." *Journal of the American Dental Association*, March 1946.
- Klem, Margaret C.: *Prepayment Medical Care Organizations*, 1945.
- Klem, Margaret C. and McKiever, Margaret F.: "Program Developments and Benefit Trends in Voluntary Health Insurance." *Social Security Bulletin*, November 1948.
- Klem, Margaret C. and Niles, Mary Cushing: "Industrial Health Programs Recommended for Federal Workers." *Industrial Hygiene Newsletter*, August 1950.
- Kober, George Martin: "History of Industrial Hygiene and Its Effects on Public Health." *A Half Century of Public Health*, 1921.
- Kresky, Beatrice and Rosenthal, Theodore: "A Survey of Medical and Sanitary Facilities in Small Industrial Establishments." *Journal of Industrial Hygiene and Toxicology*, June 1944.
- Kuh, Clifford, and Hanman, Bert: "Current Developments Affecting the Physician's Role in Manpower Utilization." *Proceedings of the Sixth Annual Congress on Industrial Health*, Chicago, February 15-16, 1944.
- Labor, Department of, Bureau of Employment Security: *Older Workers at the Public Employment Office*, 1950.
- Labor, Department of, Bureau of Employment Security: *Temporary Disability Insurance Activities Under State and Railroad Programs*. Monthly reports, August 1949-April 1950.
- Labor, Department of, Bureau of Employment Security: *Unemployment Insurance Program Letter No. 186* January 17, 1950.
- Labor, Department of, Bureau of Labor Standards: *Major Standards Recommended for State Child-Labor Legislation and the Extent to Which Existing State Child-Labor Laws Meet These Standards*, 1950.
- Labor, Department of, Bureau of Labor Statistics: "Current Labor Statistics." *Monthly Labor Review*, June 1950.
- Labor, Department of, Bureau of Labor Statistics: *Directory of Labor Unions in the United States, 1950*, 1950.
- Labor, Department of, Bureau of Labor Statistics: *Employee Benefit Plans Under Collective Bargaining*, 1948.
- Labor, Department of, Bureau of Labor Statistics: *Fact Book on the Employment Problems of Older Workers*, 1950.
- Labor, Department of, Bureau of Labor Statistics: *Welfare Work for Employees in Industrial Establishments in the United States*, 1919.
- Labor, Department of, Women's Bureau: *Women's Bureau Handbook of Facts on Women Workers*. 1948.
- Lanza, A. J.: "Education in Industrial Medicine." *American Journal of Public Health*, June 1950.
- Lear, Walter J.: "AFL Tobacco Workers Obtain Health and Welfare Benefits in Collective Bargaining Agreements." *Industrial Hygiene Newsletter*, March 1950.

- Lear, Walter J. and Bloomfield, J. J.: *The Industrial Hygienist and Medical Care*, 1948.
- Legge, Robert T.: "A Historical Background of Industrial Hygiene." *American Industrial Hygiene Association Quarterly*, June 1946.
- Legge, Robert T.: "The History of Industrial Medicine and Occupational Diseases." *Industrial Medicine*, June 1936-February 1937.
- Leggo, Christopher: "Plant Physician and Safety Engineer—And the Cooperation Between Them." *Industrial Medicine*, October 1943.
- Lund, Wendell: "Employee-Management Cooperation for Industrial Health." *Proceedings of the Fifth Annual Congress on Industrial Health, Chicago, January 11-13, 1943*.
- McCready, Benjamin W.: *On the Influence of Trades, Professions, and Occupations in the United States, in the Production of Disease (1837)*, 1943.
- McGrath, Bethel J.: "Fifty Years of Industrial Nursing in the United States." *Public Health Nursing*, 1945.
- McGrath, Bethel J. *Nursing in Commerce and Industry*, 1945.
- McNickle, R. K.: *Compensation for Disability*, 1949.
- Metropolitan Life Insurance Company, Industrial Health Section: *First-Aid Service in Small Industrial Plants*, 1947.
- Metropolitan Life Insurance Company, Industrial Health Section: *Industrial Dental Service*, circa 1943.
- Metropolitan Life Insurance Company: "Trends in the Dependent Population." *Statistical Bulletin*, June 1950.
- Millman, Nathan: "Medical Departments in Small Plants—Lay-Out, Equipment and Cost." *Industrial Medicine*, April 1947.
- Millman, Nathan; Calderone, Frank A.; Greenburg, Leonard: "Cooperative Plan for the Development of Small Plant Health and Industrial Hygiene Program in New York City." *Industrial Medicine*, June 1946.
- Miller, Morton D.: "The Program of the Insurance Companies." *American Journal of Public Health*, September 1950.
- Misher, K. W.: "Practical Application of an Industrial Dental Program." *Industrial Medicine*, February 1946.
- Mock, Harry E.: *Industrial Medicine and Surgery*, 1919.
- Mountin, Joseph W.: "Public Health and the Aging." *Public Health Reports*, June 23, 1950.
- Mustard, Harry S.: *Government in Public Health*, 1945.
- Mustard, Harry S.: *An Introduction to Public Health*, 1947.
- National Association of Manufacturers: *Industrial Health Practices, A Report of a Survey of 2,064 Industrial Establishments*, 1941.
- National Conference on Industrial Diseases, Committee of Experts: "Memorial On Occupational Diseases." *American Labor Legislation Review*, January 1911.
- National Organization for Public Health Nursing, Committee on Part-Time Nursing Service to Industry: *Part-Time Nursing in Industry as Provided by Visiting Nurse Associations in the United States*, circa 1947.
- National Safety Council: *Health Services in Industry*, 1939.
- New Jersey State Department of Health, Division of Industrial Health: "Medical Program Overhead." *Industrial Health Bulletin*, circa 1949.
- Newquist, M. N.: *Medical Service in Industry and Workmen's Compensation Laws*, 1938.
- Noland, Lloyd: "Problems of Administration in Industrial Surgery." *Journal of the American Medical Association*, October 8, 1932.
- Ober, Harry: "The Worker and His Job." *Monthly Labor Review*, July 1950.
- O'Connor, Robert B.: "The Preplacement Physical Examination Program," and "Periodic Examinations in Industry." *Health at Work*. Undated.

- Parran, Thomas: In *Transactions of the Second Annual Conference of Governmental Industrial Hygienists*, 1939.
- Patty, Frank A.: "General Motors Industrial Hygiene Services." *American Industrial Hygiene Association Quarterly*, September 1946.
- Patty, Frank A.: "Industrial Hygiene—Retrospect and Prospect." *Industrial Hygiene and Toxicology*, 1948.
- Petrie, L. M. and Lemon, J. W.: "A Health Program for Industry." *Industrial Hygiene Newsletter*, December 1950.
- Plumley, H. Ladd: *Budgeting the Costs of Illness*, 1947.
- Price, Leo: "Health Program of International Ladies' Garment Workers' Union." *Monthly Labor Review*, October 1939.
- Price, Leo: "Labor's Attitude Toward Industrial Medicine." *Long Island College of Medicine Second Postgraduate Industrial Medicine Course*, November 11, 1943.
- Pring, R. T.: "Industrial Hygiene at Kennecott." *American Industrial Hygiene Association Quarterly*, December 1949.
- Puffer, Ruth R.: "Industrial and Occupational Environment and Health." *Backgrounds of Social Medicine*, 1949.
- Railroad Retirement Board: *Annual Report 1949*, 1950.
- Rantoul, Eleanor: *Developments in the History of Industrial Hygiene 1870-1933*. Data prepared for the Metropolitan Life Insurance Co.
- Reed, Louis S.: *Blue Cross and Medical Service Plans*, 1947.
- Research Council for Economic Security: *Employee Benefit Plans: Nation-Wide Survey, Twelve Metropolitan Areas*, 1950.
- Ritter, Wayne L. and Dugger, J. W.: "Industrial Health Units: Considerations and Designs for the Smaller Installations." *Industrial Medicine*, October 1943.
- Roemer, Milton I.: "Opportunities for Public Health in Disability Insurance Programs." *Public Health Reports*, November 21, 1947.
- Rosenau, Milton J.: *Preventive Medicine and Hygiene*, 1935.
- Rosenthal, Robert: "Union-Management Welfare Plans." *Quarterly Journal of Economics*, November 1947.
- Ross, Mary: *Social Security in the United States*, 1948.
- Rubenstein, Irving and Wolk, Dena: "Sickness and Accident Benefits in Union Agreements, 1949." *Monthly Labor Review*, June 1950.
- Rusk, Howard A.: "Industries Act to Keep Check on Health of Their Leaders." *New York Times*, July 30, 1950.
- Sanders, Barkev S.: In a volume dealing with employment and wages prepared for the Twentieth Century Fund by W. S. Woytinsky and Associates, to be published in 1951.
- Sappington, C. O.: *Industrial Health: Asset or Liability*, 1939.
- Sappington, C. O.: *Industrial Health Department Functions and Relationships*, 1948.
- Sayers, R. R., and Bloomfield, J. J.: "Public Health Aspects of Industrial Hygiene." *Journal of the American Medical Association*, August 20, 1938.
- Scheele, Leonard A.: "Industrial Hygiene—A New Frontier in Public Health and Industry." *Modern Sanitation*, February 1950.
- Schrenk, H. H.; Heimann, Harry; Clayton, George D.; Gafafer, W. M.; and Wexler, Harry: *Air Pollution in Donora, Pa.*, 1949.
- Schwartz, Charles F., and Graham, R. E., Jr.: "State Income Payments in 1949." *Survey of Current Business*, August 1950.
- Selby, C. D.: "Scope and Organization of Health Service in Industry." *Industrial Hygiene*, 1939.
- Seymour, W. H.: "Fitting the Service to the Plant." *Proceedings of the Seventh Annual Congress on Industrial Health, Boston, September 30-October 2, 1946*.
- Shepard, W. P.: "What Kind of Specialty Is Industrial Medicine?" *Industrial Medicine*, June 1948.

- Shreve, Earl O.: "The Employer and His Workers' Health." *American Economic Security*, June 1949.
- Simsarian, Arax: "Group Insurance in Union Agreements." *The Conference Board Management Record*, August 1948.
- Smith, J. Henry: "Group Insurance Against Illness and Accidents." *American Economic Security*, June-July 1950.
- Social Security Administration, Bureau of Old-Age and Survivors Insurance. Data from employers' reports of taxable wages, 1948.
- Social Security Administration, Bureau of Old-Age and Survivors Insurance: *Handbook of Old-Age and Survivors Insurance Statistics, 1947, 1950.*
- Spears, Ethel M.: *Company Medical and Health Programs*, 1948.
- Steel Industry Board: *Report to the President of the United States on the Labor Dispute in the Basic Steel Industry*, 1949.
- Stern, Bernhard J.: *Medicine in Industry*, 1946.
- Strow, Carl W.: "Employee Benefit Plans in Six Midwest Metropolitan Areas." *American Economic Security*, July-August 1949.
- Strow, Carl W.: *The Extent and Economic Cost of Disability*, 1947.
- Teleky, Ludwig: *History of Factory and Mine Hygiene*, 1948.
- Tobey, James A.: *Public Health Law*, 1947.
- Townsend, James G.: "The Problem of Industrial Hygiene." *New Orleans Medical and Surgical Journal*, May 1943.
- Townsend, James G.: "The Government in Industrial Health." *American Journal of Public Health*, May 1950.
- Trasko, Victoria M.: *Industrial Health Legislation: A Compilation of State Laws and Regulations, July 1950, 1950.*
- Trasko, Victoria M.: "The Work of State and Local Industrial Hygiene Agencies." *Public Health Reports*, April 15, 1949.
- United Mine Workers of America News Bureau: "Paralyzed Miners Leave Tennessee for Rehabilitation in California." *United Mine Workers Journal*, June 1948.
- United Mine Workers of America Welfare and Retirement Fund: "Revised Hospital and Medical Services Approved by Welfare Fund as of July 1." *U. M. W. Journal*, July 1, 1950.
- U. S. Congress, Joint Committee/on the Economic Report, Subcommittee on Unemployment: *Employment and Unemployment*, 1950.
- U. S. Congress, Joint Committee on Labor-Management Relations: *Labor Management Relations; Welfare Funds*, 1948.
- U. S. Public Health Service, Division of Federal Employee Health: *The Effect of Health Services on Sickness-Absentee Rates of Federal Employees in Denver*, 1950.
- U. S. Public Health Service, Bureau of State Services: Data from the Annual Combined Report and Plan of State Health Departments, 1950.
- U. S. Public Health Service: *Health Service for Federal Employees*. Undated.
- U. S. Public Health Service, Division of Industrial Hygiene: *Directory of State, Local, and Territorial Industrial Hygiene Personnel*, 1950.
- U. S. Public Health Service, Division of Industrial Hygiene: "Medical Care Plans Vary Widely with Kinds of Industries." *Industrial Hygiene Newsletter*, June 1950.
- U. S. Public Health Service, Division of Industrial Hygiene: *Outline of an Industrial Hygiene Program*, 1943.
- U. S. Public Health Service, Division of Industrial Hygiene; Survey of Industrial Nurses, 1950.
- U. S. Public Health Service, Division of Industrial Hygiene: "Ten Eastern States To Participate in Study of Occupational Disease Reporting." *Industrial Hygiene Newsletter*, May 1950.

- U. S. Public Health Service, Office of Employees' Health: "A Suggested Plan for a Preventive Medical Program in a Federal Employees' Health Service." *Public Health Reports*, November 15, 1946.
- U. S. War Manpower Commission: *Annual Report* [1942 and 1943], 1944.
- Wampler, Fred J.: "Notes on History." *The Principles and Practice of Industrial Medicine*, 1943.
- Watt, Robert J.: "The Role of Employee Health in Industrial Relations." *Proceedings of Sixth Annual Meeting of Industrial Hygiene Foundation of America, Inc.*, 1941.
- Weiss, Abraham: "Ford-UAW (CIO) Pension and Social Insurance Contract." *Monthly Labor Review*, December 1949.
- Welt, Louis G.: "Industrial Medical Services for Small Industries." *The Yale Journal of Biology and Medicine*, July 1942.
- Whitlock, Olive M., Trasko, Victoria M., and Kahl, F. Ruth: *Nursing Practices in Industry*, 1944.
- Whitney, Jessamine S.: *Death Rates by Occupation: Based on Data of the U. S. Census Bureau, 1930, 1934*.
- Whittlesey, John W.: *Welfare Plans and Collective Bargaining*, April 1950.
- Willoughby, Irene M.: "The Health Committee." *Industrial Medicine and Surgery*, December 1949.
- Winslow, C.-E. A.: "Summary of the National Safety Council Study of Benzol Poisoning." *Journal of Industrial Hygiene*, February 1927.
- Woolsey, Theodore D.: "Estimates of Disabling Illness Prevalence in the United States." *Public Health Reports*, February 10, 1950.



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