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MENTAL HEALTH

Statistical Note No. 177

Characteristics of Admissions to the Inpatient Services of State and County Mental Hospitals, United States, 1980

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Introduction

After a decade of proclaiming the demise of the State mental hospital and the arrival of community treatment programs, the focus of the professional literature in the past 5 years has shifted to acknowledge an enduring role of public mental hospitals in the continuum of mental health care (Morrissey et al. 1980). "The fall of the State mental hospital has been proclaimed because of the decline in the resident census of State and county mental hospitals from 559,000 in 1955 to approximately 138,000 in 1980. Yet, this decline to one-quarter of the previous census does not mean the demise of the State mental hospital because, as the census fell, admissions increased. Even today these institutions continue to provide 64 percent of all inpatient days of psychiatric care" (Goldman et al. 1983). Data from the Survey and Reports Branch (SRB), National Institute of Mental Health (NIMH), show that State and county mental hospitals accounted for approximately 44,558,000 days of inpatient care and 125,246 resident patients in 1981, over half of the psychiatric inpatient days and resident patients in specialty mental health organizations (Manderscheid et al. 1985).

The contemporary roles of State and county mental hospitals are now being reanalyzed. "Inpatient care remains the dominant — and most costly — function of State and county mental hospitals. However, contrary to the stereotype, these institutions are not exclusively long-term care custodial facilities. While it is true that State and county hospitals provide the majority of inpatient days of care, due largely to their role in long-term care, they also provide a multiplicity of other inpatient care functions to a large and especially disadvantaged and disturbed patient population" (Goldman et al. 1983). Morrissey (1982) further observes, "The enduring functions of State hospitals involve custody, social control, and treatment for many of the most disturbed and most troublesome patients in the U.S. mental health system....State hospitals...serve as a 24-hour back-up and institution of last resort and ultimate responsibility."

Given this contemporary perspective on the continuing role of State and county mental hospitals in the mental health service delivery system, the sociodemographic, clinical, and treatment characteristics of patients admitted to the inpatient services of these organizations have considerable importance for program management and administration. These characteristics are examined in this note through the most recent national data. These data derive from the 1980 sample survey of patient admissions to State and county mental hospital inpatient services in the United States, conducted by SRB, NIMH. Details on the survey design and estimation procedures are presented in the technical appendix.

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Patient Demographic Characteristics

As can be seen in table A, the estimated 369,049 admissions to State and county mental hospitals tended to represent the less advantaged segments of the U.S. population in 1980. An estimated 239,400 were males (64.9 percent, not shown), with a median age of 31 and median education of 11 years. Only 71.6 percent of the male admissions were white, as contrasted with 86.4 percent of the male 1980 U.S. civilian population (not shown), and only 18.2 percent were currently married. A slightly higher percentage of female admissions were currently married (25.7 percent), but approximately four times as many females as males were widowed (10.4 vs. 2.3 percent). Female admissions had a median age of 36 and a median education of 11 years. Most females were white (72.6 percent), but markedly fewer than the 85.7 percent of the female 1980 U.S. civilian population (not shown).

Data in table 1 show that the overall age difference between the sexes resulted primarily from the larger relative frequency of male admissions in the 18-24 age group (23.2 vs. 16.8 percent) and female admissions in the 45-64 age group (27.3 vs. 17.8 percent). This latter difference was particularly pronounced for white females and males (30.2 vs. 19.5 percent).

Table 1 also shows the substantial overrepresentation of both males and races other than white among State and county mental hospital admissions, relative to their numbers in the U.S. civilian population. The overall rate of admission for males was 219.8 per 100,000 civilian population, compared with an overall admission rate of 111.1 for females. Comparison of race data in table 1 shows that the admission rate for whites was 136.8 per 100,000 civilian population, compared with an admission rate of 328.0 for all other races. This pattern was consistent for both males (182.2 vs. 457.8 per 100,000 civilian population) and females (94.1 vs. 212.6 per 100,000 civilian population). Clearly, State and county mental hospitals admit males and persons from races other than white at rates higher than would be expected from the characteristics of the U.S. civilian population.

This overrepresentation becomes even more apparent when compared with the racial distribution of admissions to private psychiatric hospital inpatient services (Rosenstein et al. 1985). Only 12.9 percent of 1980 admissions to private psychiatric hospital inpatient services were from all other races, as opposed to the 28.1 percent (table A, not shown) of State and county mental hospital admissions.

Clinical Characteristics

As shown in table B, 29.0 percent of the inpatient admissions to State and county mental hospitals during 1980 were referred from the courts and police. Self-referrals (15.9 percent), as well as referrals by family or friends (10.0 percent) and psychiatric clinics (9.9 percent), also represented major sources.

Substantial differences existed between the sexes in their sources of referral. Almost one-third of males (31.7 percent) were referred from the courts and police, while only 23.9 percent of females were referred from these sources. A higher percentage of males were self-referred (17.7 vs. 12.5 percent). Females were more likely to have psychiatric clinic referrals (12.8 vs. 8.4 percent) or family/friend referrals (12.0 vs. 8.9 percent).

Table A. Selected sociodemographic characteristics of admissions to State and county mental hospital inpatient services, by sex: United States, 1980

Inpatient services	Both sexes	Male	Female
Total	369,049	239,400	129,649
Median age	33	31	36
Percentage white	71.9%	71.6%	72.6%
Median education ¹ ...	11	11	11
Marital Status ¹	100.0%	100.0%	100.0%
Married	20.9	18.2	25.7
Never married	45.4	51.5	34.1
Divorced/separated ..	28.5	27.9	29.7
Widowed	5.2	2.3	10.4

¹Education and marital status data exclude admissions under 14 years of age.

Note: Percentages may not sum to 100 due to rounding.

Table B. Percent distribution of admissions to State and county mental hospital inpatient services, by referral source and sex: United States, 1980

Referral source	Both sexes	Male	Female
Total	369,049	239,400	129,649
Police/court	29.0%	31.7%	23.9%
Self	15.9	17.7	12.5
Family/friend	10.0	8.9	12.0
Psychiatric clinic	9.9	8.4	12.8
Other physician	7.4	7.1	7.9
CMHC	7.3	6.5	8.9
State/county mental hospital	4.9	5.3	4.4
Private psychiatrist	1.4	1.2	1.6
Other	14.2	13.3	15.9

Note: Percentages may not sum to 100 due to rounding.

Data in table C show age differences in the legal status of admissions. A higher percentage of the 18-24 year age group (12.8 percent) was admitted with an involuntary criminal status, compared to any other age group. A higher percentage of admissions 65 and older had an involuntary noncriminal status (66.4 percent), compared to younger age groups.

Table C. Percent distribution of admissions to State and county mental hospital inpatient services, by legal status and age: United States, 1980

Legal status	All ages	Age				
		Under 18	18-24	25-44	45-64	65+
Total	369,049	16,612	77,382	176,885	78,114	20,056
Voluntary	41.6%	48.9%	37.6%	43.1%	43.3%	32.0%
Involuntary - noncriminal.	51.1	48.4	49.7	49.4	53.0	66.4
Involuntary - criminal ...	7.3	2.7	12.8	7.6	3.8	1.6

Note: Percentages may not sum to 100 due to rounding.

Differences in legal status also existed by sex and race (tables D and E). A higher percentage of female admissions had involuntary noncriminal commitments (55.8 vs. 48.5 percent), and a higher percentage of male admissions had involuntary criminal commitments (9.5 vs. 3.3 percent). Compared to admissions from other races, white admissions were more often admitted on a voluntary basis (44.7 vs. 33.8 percent).

Table D. Percent distribution of admissions to State and county mental hospital inpatient services, by legal status and sex: United States, 1980

Legal status	Both sexes	Male	Female
Total	369,049	239,400	129,649
Voluntary	41.6%	42.0%	41.0%
Involuntary - noncriminal ..	51.1	48.5	55.8
Involuntary - criminal	7.3	9.5	3.3

Note: Percentages may not sum to 100 due to rounding.

Few (14.4 percent) admissions to State and county mental hospitals had no prior mental health care (table F). Almost all (79.7 percent, not shown) of those admitted had received some prior inpatient care, either exclusively (50.5 percent) or in conjunction with outpatient treatment (29.2 percent). Only 5.8 percent had received only prior outpatient care. Substantial differences did not exist between males and females with respect to prior mental health care.

Table E. Percent distribution of admissions to State and county mental hospital inpatient services, by legal status and race: United States, 1980

Legal status	All races	White	All other races
Total	369,049	265,442	103,607
Voluntary	41.6%	44.7%	33.8%
Involuntary - noncriminal ..	51.1	48.9	56.6
Involuntary - criminal	7.3	6.4	9.6

Note: Percentages may not sum to 100 due to rounding.

Table F. Percent distribution of admissions to State and county mental hospital inpatient services, by prior mental health care and sex: United States, 1980

Prior mental health care	Both sexes	Male	Female
Total	369,049	239,400	129,649
No prior mental health care	14.4%	15.1%	13.1%
Prior inpatient care only .	50.5	52.0	47.7
Prior inpatient and outpatient care	29.2	26.9	33.5
Prior outpatient care only.	5.8	6.0	5.6

Note: Percentages may not sum to 100 due to rounding.

As shown in table G, almost two-thirds of all admissions to State and county mental hospital inpatient services in 1980 received diagnoses of schizophrenia (38.0 percent) or alcohol/drug-related disorders

(26.5 percent). Schizophrenia was the most frequent diagnostic category for females (42.9 percent). Approximately equal percentages of male admissions received diagnoses of schizophrenia and alcohol/drug-related disorders. The percentage of female admissions with alcohol/drug-related diagnoses was considerably smaller (12.2 percent). By contrast, affective disorders were almost twice as frequent among females (19.8 vs. 10.0 percent). Codes included within each major diagnostic grouping in this note are provided at the end of the text.

Table G. Percent distribution of admissions to State and county mental hospital inpatient services by primary diagnosis and sex: United States, 1980

Primary diagnosis	Both sexes	Male	Female
Total	369,049	239,400	129,649
Schizophrenia	38.0%	35.3%	42.9%
Alcohol/drug-related	26.5	34.2	12.2
Affective disorders	13.4	10.0	19.8
Organic disorders ..	4.2	4.0	4.5
All other	17.9	16.5	20.5

Note: Percentages may not sum to 100 due to rounding.

Considerable differences occurred in the diagnostic distributions of admissions from different age and racial groupings (table 2). As would be expected, diagnoses of schizophrenia were found more frequently among admissions age 18-44, while organic disorders were more frequent among those 65 years of age and over. Diagnoses of schizophrenia were much more commonly found among admissions from all other races than among whites (54.6 vs. 31.5 percent), while affective disorders were more frequent among whites (15.6 vs. 7.9 percent). The difference between races in the percentage of admissions diagnosed with schizophrenia was particularly pronounced among admissions under 18 years of age. Only 6.4 percent of white admissions under 18 years of age were diagnosed with schizophrenia, compared to about one-third of those under age 18 from all other races.

Service Characteristics

As shown in table H, almost half (46.5 percent) of the inpatient admissions to State and county mental hospitals were not expected to pay for services. Personal resources (15.2 percent), Medicare (9.6 percent), commercial insurance (9.5 percent), and Medicaid (8.3 percent) were other major expected sources of payment. Small differences were observed between the races in their expected principal sources of payment. A somewhat higher percentage of whites were expected to use commercial insurance for payment, compared to admissions from all other races (10.6 vs. 6.8 percent).

To provide a description of service patterns for admissions to State and county mental hospital inpatient services, the survey was designed to sample a cohort

of admissions during a 1-month period. A followup form was completed for each sampled admission, either at the end of the survey period or at the time of discharge from the inpatient service, whichever occurred first. Data were collected on the types of treatment received by a sample patient during the study period. Table I shows the types of treatments received by admissions with selected primary diagnoses. The two most frequent treatments received by inpatient admissions were drug (65.2 percent) and individual therapy (63.9 percent). Group therapy (49.9 percent) and activity therapies (48.3 percent) were also major types of treatment received by inpatient admissions.

Table H. Percent distribution of admissions to State and county mental hospital inpatient services, by principal payment source and race: United States, 1980

Principal payment source	Total	White	All other races
Total	369,049	265,442	103,607
No payment	46.5%	46.1%	47.4%
Personal resources .	15.2	16.2	12.7
Commercial insurance	9.5	10.6	6.8
Medicare	9.6	9.7	9.3
Medicaid	8.3	7.8	9.4
Other	10.9	9.6	14.3

Note: Percentages may not sum to 100 due to rounding.

Some striking differences occurred among diagnostic groupings in the distribution of types of treatment received (table I). Drug therapy was provided to less than half (41.4 percent) of the admissions with alcohol/drug-related diagnoses, compared to 82.5 percent of the admissions diagnosed with schizophrenia. Compared with other major diagnoses, a higher percentage of admissions with alcohol/drug-related diagnoses received education.

The median length of stay (LOS) for admissions to State and county mental hospital inpatient services during 1980 was 23 days (table 3). The median for males was 21 days; for females, 28 days. This difference was due primarily to the large difference in median LOS for white males and females. In this study, length of stay for admissions was calculated based on an admission cohort. Although 17.2 percent of the admissions were still in treatment at the end of the survey period, the median LOS was not affected, since it is a positional measure that divides all admissions into two groups of equal size.

Data in table 3 also show that LOS was relatively evenly distributed across the four LOS categories (7 days or less, 8-28 days, 29-90 days, and 91 days or more). About one-quarter of admissions were released in a week or less, while about one-fifth stayed more than 3 months.

Some substantial differences occurred in the distribution of LOS for admissions with various referral sources (table 4). Much higher percentages of admissions

who were either self-referred or referred by physicians other than psychiatrists had inpatient stays of 1 week or less (43.0 percent and 37.3 percent, respectively), compared to those referred by other sources. Admissions with these two referral sources also had shorter median days of stay. By contrast, one-fourth of police/court referrals (25.1 percent) and private psychiatrist referrals (25.6 percent) stayed more than 90 days.

Table I. Percent distribution of admissions to State and county mental hospital inpatient services, by type of treatment received and primary diagnosis: United States, 1980

Type of treatment	Total	Primary diagnosis				
		Schizo- phrenia	Alcohol/ drug- related	Affective disorders	Organic disorders	All Other
Total	369,049	140,136	97,718	49,633	15,378	66,184
Individual	63.9%	65.7%	62.8%	64.0%	49.9%	64.8%
Family	7.2	7.4	4.6	9.7	3.7	9.6
Group	49.9	54.0	54.9	47.6	31.0	40.0
Drug	65.2	82.5	41.4	75.0	71.9	55.0
Detox	15.8	1.8	54.1	2.3	0.6	2.5
Self-care	16.4	20.9	11.4	13.9	28.8	13.0
Social skill ..	25.8	31.6	19.9	23.5	29.6	23.0
Activity						
therapies ...	48.3	57.9	37.6	50.0	47.2	42.9
Education	9.0	4.6	16.6	3.9	2.9	12.4
Other ¹	16.6	13.3	13.7	18.3	15.6	26.9

¹Patients who did not receive treatment are included in this category.

Note: A patient may receive more than one type of treatment. Thus, percentages may sum to more than 100.

Differences were also observed in LOS by expected principal source of payment (table 5). Compared to other admissions, those with expected principal payment sources of Medicaid or Medicare had longer median days of stay, 37 and 32 days, respectively. Admissions expected to pay with commercial insurance or personal resources were more likely than others to stay 1 week or less (33.8 and 29.0 percent, respectively). The median LOS for those expected to pay with commercial insurance was only slightly longer than 2 weeks (15 days).

Table J shows that approximately one-fifth (21.1 percent) of admissions discharged from State and county mental hospital inpatient services were not referred for further services. The largest percentage of referrals at time of discharge was to outpatient clinics (47.7 percent). This was the predominant category for both males and females, although it was much more frequent among females (58.7 vs. 42.1 percent for males). This difference is partially attributable to the larger percentage of males referred to alcohol and drug abuse treatment programs (14.8 vs. 6.3 percent). In addition, approximately 9.4 percent of males were referred to courts or correctional agencies at

Notes

The diagnostic groupings used in this publication are defined as follows:

<u>Major diagnostic grouping</u>	<u>Combined DSM-II/ICDA-8 codes</u>	<u>Combined DSM-III/ICD-9-CM codes</u>
Affective disorders..	296, 298.0, 300.4	296, 298.0, 300.4, 301.11, 301.13
Schizophrenia.....	295	295, 299
Alcohol/drug-related.	291, 294.3, 303, 304, 309.13, 309.14	291, 292, 303, 304, 305.0-305.9, 327, 328
Organic disorders....	290, 292, 293, 294 (except 294.3), 309.0, 309.2-309.9	290, 293, 294, 310

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Table 1. Number, percent distribution, and rate per 100,000 civilian population¹ of admissions to State and county mental hospital inpatient services, by race, sex, and age: United States, 1980

Race and sex	Age					
	Total	Under 18	18-24	25-44	45-64	65+
	Number					
Total, all races	369,049	16,612	77,382	176,885	78,114	20,056
Male	239,400	11,498	55,647	118,613	42,729	10,913
Female	129,649	5,114	21,735	58,272	35,385	9,143
White	265,442	12,432	53,179	121,527	61,792	16,512
Male	171,341	8,477	38,191	82,034	33,403	9,236
Female	94,101	3,955	14,988	39,493	28,389	7,276
All other races.	103,607	4,180	24,203	55,358	16,322	3,544
Male	68,059	3,021	17,456	36,579	9,326	1,677
Female	35,548	1,159	6,747	18,779	6,996	1,867
	Percent distribution					
Total, all races	100.0%	4.5	21.0	47.9	21.2	5.4
Male	100.0%	4.8	23.2	49.5	17.8	4.6
Female	100.0%	3.9	16.8	44.9	27.3	7.1
White	100.0%	4.7	20.0	45.8	23.3	6.2
Male	100.0%	4.9	22.3	47.9	19.5	5.4
Female	100.0%	4.2	15.9	42.0	30.2	7.7
All other races.	100.0%	4.0	23.4	53.4	15.8	3.4
Male	100.0%	4.4	25.6	53.7	13.7	2.5
Female	100.0%	3.3	19.0	52.8	19.7	5.3
	Rate per 100,000 civilian population					
Total, all races	163.6	26.1	264.6	282.9	175.7	78.0
Male	219.8	35.4	387.9	388.1	202.3	105.3
Female	111.1	16.4	145.8	182.3	151.7	59.6
White	136.8	23.7	214.5	225.3	156.5	70.8
Male	182.2	31.5	311.4	307.9	176.9	98.5
Female	94.1	15.4	119.6	144.7	137.9	52.2
All other races.	328.0	37.5	543.4	643.8	327.7	147.5
Male	457.8	53.7	838.0	931.7	416.5	168.7
Female	212.6	21.0	284.4	401.9	255.1	132.4

Note: Percentages may not sum to 100 due to rounding.

¹Population estimates used as denominators for rate computations are from the Current Population Reports of the U.S. Bureau of the Census, Series P-25, No. 929, table 3, p.19.

Table 2. Number and percent distribution of admissions to State and county mental hospital inpatient services, by race, primary diagnosis, and age: United States, 1980

Race and primary diagnosis	Age					
	Total	Under 18	18-24	25-44	45-64	65+
	Number					
All races	369,049	16,612	77,382	176,885	78,114	20,056
Schizophrenia	140,136	2,209	31,802	78,190	24,371	3,564
Alcohol/drug-related	97,718	2,831	17,367	48,118	26,261	3,141
Affective disorders	49,633	1,572	6,908	23,078	14,401	3,674
Organic disorders ..	15,378	280	833	2,951	3,607	7,707
All other	66,184	9,720	20,472	24,548	9,474	1,970
White	265,442	12,432	53,179	121,527	61,792	16,512
Schizophrenia	83,557	799	17,588	44,756	17,375	3,039
Alcohol/drug-related	77,325	2,480	14,080	36,699	21,239	2,827
Affective disorders	41,491	1,164	5,235	19,305	12,596	3,191
Organic disorders ..	11,078	*	643	1,551	2,711	6,087
All other	51,991	7,903	15,633	19,216	7,871	1,368
All other races	103,607	4,180	24,203	55,358	16,322	3,544
Schizophrenia	56,579	1,410	14,214	33,434	6,996	525
Alcohol/drug-related	20,393	*	3,287	11,419	5,022	*
Affective disorders	8,142	408	1,673	3,773	1,805	*
Organic disorders ..	4,300	*	*	1,400	896	1,620
All other	14,193	1,817	4,839	5,332	1,603	602
	Percent distribution					
All races	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Schizophrenia	38.0	13.3	41.1	44.2	31.2	17.8
Alcohol/drug-related	26.5	17.0	22.4	27.2	33.6	15.7
Affective disorders	13.4	9.5	8.9	13.0	18.4	18.3
Organic disorders ..	4.2	1.7	1.1	1.7	4.6	38.4
All other	17.9	58.5	26.5	13.9	12.1	9.8
White	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Schizophrenia	31.5	6.4	33.1	36.8	28.1	18.4
Alcohol/drug-related	29.1	19.9	26.5	30.2	34.4	17.1
Affective disorders	15.6	9.4	9.8	15.9	20.4	19.3
Organic disorders ..	4.2	*	1.2	1.3	4.4	36.9
All other	19.6	63.6	29.4	15.8	12.7	8.3
All other races	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Schizophrenia	54.6	33.7	58.7	60.4	42.9	14.8
Alcohol/drug-related	19.7	*	13.6	20.6	30.8	*
Affective disorders	7.9	9.8	6.9	6.8	11.1	*
Organic disorders ..	4.2	*	*	2.5	5.5	45.7
All other	13.7	43.5	20.0	9.6	9.8	17.0

*Five or fewer sample cases; estimate not shown because it does not meet standards of reliability.

Note: Percentages may not sum to 100 due to rounding.

Table 3. Number and percent distribution of admissions¹ discharged within specified time intervals, and median length of stay of admissions¹ to State and county mental hospital inpatient services, by race and sex: United States, 1980

Length of stay	Race and sex									
	All races			White			All other races			
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
Total	366,766	237,942	128,824	264,054	170,530	93,524	102,712	67,412	35,300	7,518
7 days or less.	94,967	64,798	30,169	71,723	49,072	22,651	23,244	15,726	7,518	11,551
8-28 days	107,570	72,172	35,398	73,475	49,628	23,847	34,095	22,544	11,551	8,923
29-90 days	89,922	56,789	33,133	65,200	40,990	24,210	24,722	15,799	8,923	7,308
91 days or more ²	74,307	44,183	30,124	53,656	30,840	22,816	20,651	13,343	7,308	
					Number					
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
7 days or less.	25.9	27.2	23.4	27.2	28.8	24.2	22.6	23.3	21.3	32.7
8-28 days	29.3	30.3	27.5	27.8	29.1	25.5	33.2	33.4	32.7	25.3
29-90 days	24.5	23.9	25.7	24.7	24.0	25.9	24.1	23.4	25.3	20.7
91 days or more ²	20.3	18.6	23.4	20.3	18.1	24.4	20.1	19.8	20.7	
					Percent distribution					
Median length of stay	23	21	28	23	21	29	22	21	23	23

¹Patients who died while in treatment are excluded.

²Patients who were still in treatment at the end of the survey period are included in this category.

Note: Percentages may not sum to 100 due to rounding.

Table 4. Number and percent distribution of admissions¹ discharged within specified time intervals, and median length of stay of admissions¹ to State and county mental hospital inpatient services, by referral source: United States, 1980

Length of stay	Total	Referral source					Number
		Police/court	Self	Family/friend	Private psychiatrist	Other physician	
Total	366,766	106,216	58,503	36,710	5,031	26,929	133,377
7 days or less.	94,967	20,638	25,183	7,935	1,012	10,056	30,143
8-28 days	107,570	31,115	16,105	11,055	1,726	9,968	37,601
29-90 days	89,922	27,842	10,357	13,070	1,003	3,889	33,761
91 days or more ²	74,307	26,621	6,858	4,650	1,290	3,016	31,872
Percent distribution							
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
7 days or less.	25.9	19.4	43.0	21.6	20.1	37.3	22.6
8-28 days	29.3	29.3	27.5	30.1	34.3	37.0	28.2
29-90 days	24.5	26.2	17.7	35.6	19.9	14.4	25.3
91 days or more ²	20.3	25.1	11.7	12.7	25.6	11.2	23.9
Median length of stay	23	30	11	28	22	11	28

¹Patients who died while in treatment are excluded.

²Patients who were still in treatment at the end of the survey period are included in this category.

Note: Percentages may not sum to 100 due to rounding.

Table 5. Number and percent distribution of admissions¹ discharged within selected time intervals, and median length of stay of admissions¹ to State and county mental hospital inpatient services, by expected principal source of payment: United States, 1980

Length of stay	Total	Source of payment					Other
		No payment	Personal resources	Commercial insurance	Medicare	Medicaid	
		Number					
Total	366,766	170,927	55,955	34,972	34,924	30,199	39,789
7 days or less.	94,967	46,035	16,231	11,837	6,279	6,137	8,448
8-28 days	107,570	52,015	15,884	10,532	10,342	7,839	10,958
29-90 days	89,922	40,462	13,349	8,529	9,268	7,140	11,174
91 days or more ²	74,307	32,415	10,491	4,074	9,035	9,083	9,209
				Percent distribution			
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
7 days or less.	25.9	26.9	29.0	33.8	18.0	20.3	21.2
8-28 days	29.3	30.4	28.4	30.1	29.6	26.0	27.5
29-90 days	24.5	23.7	23.9	24.4	26.5	23.6	28.1
91 days or more ²	20.3	19.0	18.7	11.6	25.9	30.1	23.1
Median length of stay	23	21	21	15	32	37	29

¹Patients who died while in treatment are excluded.

²Patients who were still in treatment at the end of the survey period are included in this category.

Note: Percentages may not sum to 100 due to rounding.

Technical Appendix
1980 Sample Survey
State and County Mental Hospital Inpatient Admissions
Survey Design and Procedure*

A. Survey Design

Scope of the survey

This survey was conducted during the period July 1980 to October 1980 by the National Institute of Mental Health (NIMH), in cooperation with State mental health agencies. The target population included all patients admitted to the inpatient services of State and county mental hospitals located in the 50 States and the District of Columbia during 1980. Excluded were other public psychiatric inpatient organizations, such as Veterans Administration Medical Centers, military hospitals, Public Health Service hospitals, and territorial hospitals.

Total additions to State and county mental hospital inpatient services consist of admissions (new and readmissions) and returns from long-term leave. The survey population included only new admissions and readmissions, and excluded returns from long-term leave, whereas totals used in ratio adjustment (described below) included returns from long-term leave. The exclusion of these latter cases from the survey population could produce a slight upward bias in the estimates; however, since the number of returns from long-term leave was small in relation to other types of admissions, such bias should be negligible. Hereafter, the term admissions is used.

Sampling frame and sample size

The sampling frame (universe) for the survey consisted of all hospitals reported in the January 1979 NIMH Inventory of Mental Health Facilities. This inventory collected data on services, caseload, staffing, and expenditures for the previous fiscal year. The caseload data on admissions formed the basis for the stratification of the universe of State and county mental hospital inpatient services, as described below.

The original universe for the survey consisted of 274 State and county mental hospitals. The target sample consisted of 169 hospitals. Of these, 10 refused to participate, and 3 were out of scope: 1 had closed, and 2 had been incorrectly classified. Thus, 156 hospitals participated in the 1980 survey and provided data for 4,867 sample inpatient admissions.

Sample design

This survey used a stratified probability design selected in two stages. All hospitals in States identified by the Indian Health Service as having a large proportion of Native American population were selected into a certainty stratum. Hospitals in the following states were included in the

*Prepared by Survey and Reports Branch, Division of Biometry and Applied Sciences, National Institute of Mental Health.

certainty stratum: Alaska, Arizona, Colorado, Idaho, Kansas, Montana, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming. Remaining hospitals were stratified by size into four primary strata, defined by the annual number of inpatient admissions reported in the 1979 Inventory, as shown in table I. For each primary stratum, hospitals were listed by State, and sampling of hospitals was systematic, with a random start within the first sampling interval.

The second sampling stage consisted of the selection of a sample of patients admitted to sample hospitals during the month of July 1980. Hence, each sample hospital reported data for a cluster of patients included in the second stage sample. Each sample hospital was asked to list all inpatient admissions during the month of July 1980 on a form provided by NIMH, and to complete patient questionnaires for each admission appearing on one of the predesignated sample lines. The listing booklets were designed with differential sampling fractions, ranging from a 100 percent sample to a 5 percent sample, so that larger programs sampled a smaller proportion of their admissions, thus maintaining approximately equal reporting levels among sampled hospitals. For those hospitals sampling every fourth, tenth, or twentieth admission, sampling of admissions was systematic, with a random start within the first sampling interval.

Data collection and instrument

The sample hospitals completed patient questionnaires on each designated sample patient. Most items were obtained from the hospital records by medical records administrator staff. The data collection instrument was a two-part form. The first part of the form requested information pertaining to the admission of the patient and was completed either at the time of admission, upon discharge, or at the end of the study period. The second part of the form requested data about the treatment of the patient, as well as a discharge summary if the patient was discharged. This second part was completed at the end of the 3-month study period or at the time of the patient's discharge from the inpatient service, whichever occurred first. Both the individual patient questionnaires and the listing booklet for the month's admissions were mailed by the sample hospitals to NIMH for editing and processing.

B. Limitations of Design

Nonresponse

As in any survey, there were three possible types of nonresponse:

1. failure of a sample hospital to participate in the survey
2. failure to obtain data on an admission designated as a sample case
3. failure to obtain specific items of information (age, diagnosis, etc.) for individual sample patients.

Estimates presented in this report were adjusted for the failure of a sample hospital to respond through the use of an adjustment factor (number of selected hospitals divided by number of respondent hospitals) in conjunction with inflation by the inverse of the first stage sampling fraction. The number of sample hospitals that did not respond to the

survey is detailed in table I, by strata. No instances occurred of failure to obtain data on a sample admission. Thus, adjustment for this type of nonresponse was not necessary. Data were adjusted for nonresponse to specific items as follows: records were sorted on a core set of variables, such as sex, age-category, diagnostic-category, stratum, region, and patient number, and the value of the variable from the previous record was substituted for the unknown value. Unless otherwise footnoted, the percentage of cases with missing data was 5 percent or less for any given variable.

Seasonality

The survey data were inflated to represent the annual number and characteristics of admissions to the inpatient services of State and county mental hospitals. The method for inflation is described below. However, patients were sampled only for a 1-month period. Seasonal variations in the number and characteristics of patient admissions were not considered in the estimation or variance calculations for this survey.

C. Estimation

Estimation was carried out in three steps:

1. Within each primary stratum, patient records were weighted by the product of the inverse of the first and second stage sampling fractions, the nonresponse adjustment factor (described above), and the ratio of total annual admissions (described below) to total sample-month admissions. This weight has the effect of inflating sample cases to annual facility totals and inflating sample facility totals to stratum totals.

2. Within each primary stratum, weights developed in step one were multiplied by a stratum-level ratio adjustment factor defined as the ratio of the total annual admissions in 1980 (as determined from the 1981

Inventory of Mental Health Facilities) for all hospitals in the stratum, to the inflated total count of admissions, as calculated from the procedure described in step one. The purpose of this ratio adjustment was to take into account all relevant information in the estimation process, thereby reducing the variability of the estimate. The effect of this ratio adjustment was to bring the estimates derived from the sample into agreement with the known total number of admissions.

3. Resulting stratum level estimates were summed across strata to derive totals and subtotals for different domains of interest.

D. Reliability of Estimates

Background

Because estimates presented in this report are based on sampling, they are likely to differ from figures that would have been obtained from a complete enumeration of the universe using the same instruments. Results are subject to both sampling and nonsampling errors. Nonsampling errors include biases due to inaccurate reporting, processing, and measurement, as well as error due to nonresponse and incomplete reporting. These types of errors cannot be measured, but have been minimized to the extent possible

through the procedures used for data collection, editing, and quality control.

The sampling error (standard error) of a statistic is inversely proportional to the square root of the number of observations in the sample. Thus, as the sample size increases, the standard error decreases. The standard error measures the variability that occurs by chance, because only a sample rather than the entire universe is surveyed. The chances are about two out of three that an estimate from the sample differs by less than one standard error from the value that would be obtained from a complete enumeration. The chances are about 95 out of 100 that the difference is less than twice the standard error, and about 99 out of 100 that it is less than three times as large.

In this report, statistical inference is based on the construction of 95 percent confidence intervals for estimates (0.05 level of significance). All statements of comparison in the text relating to differences such as "higher than," "less than," etc., indicate that the differences are statistically significant at the 0.05 level or better. Terms such as "similar to" or "no difference" mean that statistically, no difference exists between the estimates being compared. Lack of comment on the difference between any two estimates does not imply that a test was completed and there was a finding of no significance.

Calculation of standard errors

Standard errors were calculated for a broad range of subtotals within age, sex, and race subclasses through the use of SESUDAAN: Standard Errors Program for Computing of Standardized Rates from Sample Survey Data developed at the Research Triangle Institute by B.V. Shah. This procedure computes estimated sampling variance through the use of a Taylor series approximation. As applied to data from the present survey, variance estimates for subtotals were calculated for each primary stratum and then summed across strata to derive standard errors for domains of interest. The variance estimate for each primary stratum includes both the between-facility and the within-facility components of variance, with corrections for finite populations applied at both sampling stages. Since preliminary work suggested that use of stratum-level ratio adjustment did not appreciably affect the variance estimates, all variance estimates were calculated on ratio-adjusted subtotals.

Relative standard errors of subtotal estimates

The relative standard error of a subtotal estimate is obtained by dividing the standard error of the estimate by the estimate itself and is expressed as a percent of the estimate. Approximate relative standard errors for aggregate subtotal estimates are presented in figure I. Approximately 30 curves were generated by inputting the relative variance and the inverse of weighted aggregate totals obtained from SESUDAAN into the GLM (General Linear Models) procedure in SAS (Statistical Analysis System). GLM uses the method of least squares to obtain the a and b parameters (listed in table II) and the predicted relative variance. From this, the predicted relative standard error was calculated and plotted against aggregate subtotal estimates using the Gplot procedure in SAS/GRAPH. The 30 curves generated were very similar, and the generalized curve presented in figure I represents the most conservative of this set of curves. This generalized relative standard error curve indicates the magnitude of the

relative standard error for estimates of various sizes, and should be interpreted as approximate rather than exact for any specific estimate.

Alternatively, the relative standard error, $RSE(x)$, for a subtotal estimate may be calculated directly using the following formula, where x is the size of the estimate and a and b are the parameters listed in table II. Direct computation will produce more precise results than use of the approximations in figure I.

$$RSE(x) = \sqrt{a + \frac{b}{x}} \cdot 100$$

Relative standard errors of rates

The approximate relative standard error for a rate, in which the denominator is the United States population or one or more of the age-sex-race subgroups of the United States population, is equivalent to the relative standard error of the numerator of the rate, as presented in figure I.

Relative standard errors of estimated percentages

The approximate relative standard error of an estimated percentage, expressed in percentage terms, may be determined by use of figure II. The relative standard error of the percent is obtained from the appropriate curve, and may be interpolated for percentages based on denominators not shown in the figure. These relative standard errors should be interpreted as approximate rather than exact for any specific percentage.

Alternatively, relative standard errors for percents, $RSE(p)$, may be calculated directly using the following formula, where p is the percentage of interest, x is the base of the percentage, and b is the parameter listed in table II.

$$RSE(p) = \sqrt{\frac{b}{x} \cdot \frac{(100-p)}{p}} \cdot 100$$

Relative standard errors of medians

In this report, medians were calculated on ungrouped data using the PROC UNIVARIATE procedure from SAS. The sampling variability of an estimated median depends on the form of the distribution as well as the size of the base upon which it is calculated. An approximate method for calculating the standard error of the median when the underlying population is normally distributed is to multiply the standard error of the mean by a factor of 1.2538. For estimated medians in this report, estimates were converted into logs in order to normalize distributions, and standard errors of the mean were calculated. The anti-logs were then taken, and the resultant standard errors were multiplied by 1.2538 to obtain an approximate standard error for the median. Confidence intervals were then calculated around the median obtained from PROC UNIVARIATE using this estimated standard error.

Alternatively, 95 percent confidence intervals for medians may be approximated as follows:

1. Determine the relative standard error, expressed in percentage terms, of the estimate of 50 percent from the relevant distribution in figure II;
2. Convert the relative standard error to the standard error, i.e.,

$$\frac{\text{RSE} \cdot \text{EST}}{100}$$

3. Add to and subtract from 50 percent twice the standard error determined in step (2);
4. Using the distribution of the characteristic, calculate the values from the distribution corresponding to the two points established in step (3). These values will be the upper and lower limits for the 95 percent confidence interval.

Estimates of differences between two statistics

The standard error of a difference is approximately the square root of the sum of the squares of each standard error considered separately. This formula will represent the actual standard error quite accurately for the difference between separate and uncorrelated characteristics, although it is only a rough approximation in most other cases.

Table I. Number of State and county mental hospitals in the universe and in the sample, by response status and by primary strata; and number of respondent sample cases by primary strata

Primary size strata (annual admissions)	Number of hospitals in universe	Number of hospitals in the sample				Number of patients in actual sample
		Total	Responding in scope	Out of scope	Nonre- sponding	
Total, all strata	274	169	156	3	10	4,867
0-999	123	61	55	1	5	1,806
1000-2499	86	43	40	1	2	1,339
2500-4999	33	33	31	-	2	885
5000+	7	7	6	-	1	132
Indian Health (all sizes) .	25	25	24	1	-	705

Table II. Parameters for calculating approximate standard errors of estimated numbers and percentages for selected characteristics from the 1980 sample survey of admissions to State and county mental hospital inpatient services

Type of characteristic	Parameter	
	a	b
Age by sex by race	0.00207	109.987
Age by sex and race by:		
Diagnosis	0.02286	92.598
Payment	0.02486	95.669
Length of stay	0.01446	94.612

**DEPARTMENT OF
HEALTH & HUMAN SERVICES**

**Public Health Service
Alcohol, Drug Abuse, and
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