Cotterill

Report to Congress:

Impact of the Medicare Hospital Prospective Payment System

1985 Annual Report

Department of Health and Human Services
Health Care Financing Administration
Office of Research and Demonstrations

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This is the second report in an annual series on the impact of the Medicare Hospital Prospective Payment System (PPS), which was requested by Section 603(a)(2)(A) of Public Law 98-21, the Social Security Amendments of 1983. The first annual report was devoted primarily to a discussion of the development and major features of PPS, an outline of the methodological approach to be taken in evaluating its impact, and a presentation of early descriptive data on the performance of the health care system during the first year of the new system. This year's report is intended to update the information presented in the first report and to address several additional issues that could not be analyzed in that report. Although it is still mostly restricted to descriptive findings, this report does provide evidence on several aspects of the impact of PPS. The new system appears to have been implemented smoothly and to have encouraged substantial changes in the behavior of hospitals and of other major groups within the health care sector. In addition, there has been a noticeable effect on the rate of growth of Medicare program expenditures.

ACKNOWLEDGMENTS

The Project Director for this report was Allen Dobson, who was then the Director of the Office of Research, Office of Research and Demonstrations, Health Care Financing Administration (HCFA). The current Acting Director of the Office of Research is J. Michael Fitzmaurice. Stuart Guterman, an Economist with the Division of Economics and Reimbursement Studies (DRES) of the Office of Research, coordinated the production of the report.

The authors of the report are as follows: Chapters 1 and 2 were written by Stuart Guterman; Chapter 3 was written by Stuart Guterman, with assistance from Timothy Greene, also of DRES; Chapter 4 was written by Lawrence Kucken, Paul Eggers, Gerald Riley, and James Beebe, all with the Division of Beneficiary Studies (DBS) of the Office of Research; Chapter 5 was written by Timothy Greene and William Sobaski, Director, DRES, with assistance from Stuart Guterman; Chapter 6 was written by Sherry Terrell, Chief, Non-Institutional Studies Branch, DRES, and Judith Sangl, Terrence Kay, and John Petrie, all with DRES; Chapter 7 was written by Stuart Guterman, with assistance from Alvin Freedman, also of DRES.

The authors would like to thank the many additional people within HCFA who contributed their labor, data, and comments to the report. Although they are not named here, their contributions are greatly appreciated.

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EXECUTIVE SUMMARY

Introduction

This is the second in a series of annual reports to be prepared by the Department of Health and Human Services (DHHS) to describe and assess the impact of the Medicare Hospital Prospective Payment System (PPS). PPS was enacted by the Congress in the Social Security Amendments of 1983 (Public Law 98-21). Section 603(a)(2)(A) of that legislation requires the Secretary of Health and Human Services to:

> "...study and report annually to the Congress at the end of each year (beginning with 1984 and ending with 1987) on the impact, of the payment methodology under Section 1886(d) of the Social Security Act during the previous year, on classes of hospitals, beneficiaries, and other payors for inpatient hospital services, and other providers, and, in particular, on the impact of computing DRG prospective payment rates by census division, rather than exclusively on a national basis."

Each annual report is also to include recommendations for such changes in legislation as the Secretary deems appropriate.

Section 9305(i)(1)(A) of the Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509) extended the mandate for these annual reports through 1989.

In response to this congressional mandate, DHHS has undertaken a major effort to evaluate the payment system. This evaluation effort has been designed and implemented with the following objectives in mind:

- To conduct a systematic evaluation of a policy change that promises to have a dramatic effect on the entire health care system;

- To describe the behavioral changes occurring among the institutions and individuals that provide and utilize health care, particularly among Medicare providers and beneficiaries;

- To assess the impact of the new payment system on the Medicare program itself, particularly on its fiscal solvency; and

- To determine, to the extent possible, the degree to which PPS is responsible for the changes that are being observed since its implementation.

The requirement for an annual series of reports reflects recognition of the fact that the impact of PPS cannot be conclusively evaluated at one point in time. Until the new system has been fully implemented and the affected parties have had sufficient

time to respond, its ultimate effects will not be clear. In addition, the research objectives listed above can only be accomplished over a period of time long enough to allow for the development of both the data sources and methodology appropriate for the task.

The first report in this annual series (U.S. Department of Health and Human Services, 1985) was devoted primarily to a discussion of the development and major features of PPS, an outline of the methodological approach to be taken in evaluating its impact, and a presentation of early descriptive data on the performance of the health care sector during the first year of PPS's implementation. This year's report is intended to update the information presented in the first report and to address several additional issues that could not be addressed in that report. Data from sources not available last year are included in this report, as well as the results of several studies that were in their initial or planning stages at the time that the previous report was written.

Because the findings described in this report are interim in nature, it does not contain any specific legislative recommendations. Legislative recommendations on particular aspects of the payment system can and will be submitted by the Department as they are needed.

Section 603(a)(1)(C) of the Social Security Amendments of 1983 (Public Law 98-21) lists several studies on issues related to PPS that are to be included in the 1985 annual report:

- The feasibility and impact of eliminating or phasing out separate urban and rural payment rates;

- Prospective payment of hospitals currently excluded from PPS;
- The appropriateness of outlier payment under PPS and the advisability and feasibility of refinements to the DRGs;
- The feasibility and desirability of applying the prospective payment methodology to all payers for inpatient hospital services; and
- The impact of PPS on hospital admissions and the feasibility of making a volume adjustment in the PPS payment rates or requiring pre-admission certification in order to minimize the incentive to increase admissions.

Due to the substantive nature of each of these issues, they have been conducted as separate studies and have been or will be submitted under separate cover.

Methodology

The change from cost-based reimbursement to prospective payment represents a fundamental change in the role of the Medicare program within the health care system. Rather than reimbursing the hospital for actual costs incurred, the Medicare program now pays a fixed price for a known and defined product—the hospital stay. PPS is designed to change hospital behavior by directly altering the economic incentives facing hospital decision-makers.

Hospitals' responses to the new incentives facing them under PPS can, in turn, be expected to have far-reaching effects on the other groups of institutions and individuals that provide, consume, and pay for health care in this country. These groups include Medicare beneficiaries, other payers for inpatient hospital services, and other providers of health care. In addition, the impact of PPS on the Medicare program itself is important, since the maintenance of the fiscal integrity of the Medicare Hospital Insurance (HI) Trust Fund was the primary impetus for the

enactment of the new payment system.

The issues involved in evaluating a policy initiative as dramatic and far-reaching as prospective payment are numerous and complex. In order to address these issues in a logical and comprehensive manner, the a priori assumptions about the incentives facing each group potentially affected by PPS have been used to derive a list of the hypothesized impacts of the new system. This set of hypothesized impacts is represented in a PPS Study Issues Matrix, which is intended to provide a framework for the analysis to be conducted over the next several years.

One of the major problems in evaluating PPS is that of attribution. It is difficult to draw strong causal inferences about the effects of prospective payment because of the rapidly changing nature of the health care sector. Many changes are occurring that might plausibly account for effects of the sort that are anticipated under PPS, such as intensified cost-containment efforts among other public and private payers, the increased supply of physicians, and the increasing availability of alternative arrangements for the provision of and payment for health care. Thus, both desirable and undesirable effects that might be consistent with expectations about PPS may actually be caused by other factors or the joint product of PPS and several other factors.

In addition, the nationwide scope of the new system precludes the existence of a natural "control," or comparison test, group; while four States were originally excluded from PPS, they were explicitly excluded on the grounds of their participation in other cost-containment experiments. Thus, although they may sometimes be used to compare trends over time, the waiver States do not constitute a true control group.

	Hypothetical Impact on Hospitals	Hypothetical Impact on Beneficiaries
Economic Impact		
--Anticipated Benefits:	o Shorter inpatient stays. o Fewer unnecessary days and services. o More specialization in efficiently provided services. o Better coordination of outpatient, inpatient, and post-hospital care, through improved discharge planning. o Reduction in excess capacity. o Adoption of cost-reducing technology. o Increased price competition among providers of supplies and equipment. o Application of improved management practices.	o Part A liability limited to legal deductible and coinsurance amounts.
--Other Potential Consequences:	o Increases in unnecessary admissions, readmissions, and transfers. o Increases in hospital case mix, due to changes in coding procedures ("DRG creep"). o Separate provision of services that were traditionally considered part of routine inpatient care ("unbundling"). o Increase in cases with exceptionally lengthy stays or high costs (outliers), due to additional outlier payments. o Underpayment of hospitals that tend to treat cases that are more severely ill or that require more intensive care. o Reductions in hospital staffing levels. o Diminished hospital financial performance, particularly among certain groups of hospitals.	o Higher deductible and coinsurance amounts, if length of stay decreases more rapidly than cost per case. o Higher out-of-pocket cost for non-hospital services, as care is shifted to outpatient and office settings and utilization of post-hospital care increases.
Impact on the Quality of Care		
--Anticipated Benefits:	o Reduction in the risk of nosocomial infection and other iatrogenic events, as lengths of inpatient stays decrease. o Fewer unnecessary tests and services. o Specialization in services most efficiently and effectively provided. o More selective and effective use of new technology.	o Reduction in the risk of nosocomial infection and other iatrogenic events, as lengths of inpatient stays decrease. o Fewer unnecessary tests and services. o Specialization in services most efficiently and effectively provided. o More selective and effective use of new technology.
--Other Potential Consequences:	o Increase in unnecessary admissions o Reductions in necessary tests and other ancillary services. o Tendency toward premature discharges. o Reluctance to adopt quality-enhancing (but expensive in the short run) technology.	o Reductions in necessary tests and other ancillary services. o Decrease in necessary inpatient physician consultations. o Tendency toward premature discharges.
Impact on Access to Care		
--Anticipated Benefits:	o Improved coordination of outpatient, inpatient, and post-hospital care. o Shifting of services to more appropriate (and inexpensive) settings.	o Improved coordination of outpatient, inpatient, and post-hospital care. o Shifting of services to more appropriate (and inexpensive) settings.
--Other Potential Consequences:	o Reluctance of hospitals to accept patients who present greater risk of financial loss ("skimming"). o Tendency to transfer patients who are associated with high costs or an inability to pay for their care to other hospitals ("dumping").	o Reluctance of hospitals to accept patients who present greater risk of financial loss ("skimming"). o Tendency to transfer patients who are associated with high costs or an inability to pay for their care to other hospitals ("dumping"). o Lack of appropriate post-hospital care, as more severely ill patients are discharged earlier ("sicker and quicker") from inpatient care.

	Hypothetical Impact on Other Payers	Hypothetical Impact on Other Providers
Economic Impact		
--Anticipated Benefits:	o Rapid diffusion of prospective payment and other innovative payment methodologies. o Increased cost consciousness among all payers and providers, resulting in cost savings for payers, providers, and consumers.	o Increased provision of health care in less expensive non-hospital settings. o Improved coordination of outpatient, inpatient, and post-hospital care.
--Other Potential Consequences:	o Potential shifting of cost burden to other payers for hospital inpatient services, with resulting increases in health insurance premiums and/or reductions in benefits. o Increase in the economic consequences of uncompensated care, as the burden for payment of that care is shifted to other payers and/or providers.	o Inappropriate shifting of hospital treatment to outpatient settings. o Pressure on physicians to inappropriately alter their practice patterns. o Too few in-hospital physician consultations. o Increase in the volume and complexity of services required by more severely ill patients discharged earlier ("sicker and quicker") from inpatient to post-hospital care.
Impact on the Quality of Care		
--Anticipated Benefits:	o Improved coordination of health care treatment, payment, and coverage.	o More efficient patient management. o Improved coordination of outpatient, inpatient, and post-hospital care.
--Other Potential Consequences:	o Competing incentives to health care providers treating patients with different types of coverage.	o Too few in-hospital physician consultations. o Inappropriate shifting of hospital treatment to outpatient settings. o Inability of post-hospital care providers to meet the greater and more complex care requirements by more severely ill patients discharged earlier ("sicker and quicker") from inpatient care.
Impact on Access to Care		
--Anticipated Benefits:	o Reduced health care charges and insurance premiums. o Improved coordination of health care treatment, payment, and coverage.	o Increased availability of services in (less expensive) non-hospital settings. o Improved coordination of outpatient, inpatient, and post-hospital care.
--Other Potential Consequences:	o Decreased coverage of indigent patients and other uninsured or underinsured patients who are unable to pay for health care.	o Longer backlogs of patients awaiting post-hospital care. o Obstacles to providing a continuum of health care, due to certificate of need restrictions, contracting prohibitions, etc.

	Hypothetical Impact on the Medicare Program
Economic Impact	
--Anticipated Benefits:	o Slower rate of growth of hospital expenditures. o Improvement in solvency of the program overall. o More predictable program outlays.
--Other Potential Consequences:	o Increased growth in expenditures for capital and other cost categories reimbursed on a "pass-through" basis. o Increased growth in expenditures on substitutes for inpatient hospital care. o Increased growth in expenditures for post-hospital care.
Impact on the Quality of Care	
--Anticipated Benefits:	o More efficient provision of both hospital and overall health care.
--Other Potential Consequences:	o Replacement of quality with financial considerations as the objective of health care providers.
Impact on Access to Care	
--Anticipated Benefits:	o Reduction in the cost of hospital care. o Encouragement of efficiency in the management of health care providers. o Promotion of the success of efficient providers of hospital care. o Improvement in the solvency of the program overall.
--Other Potential Consequences:	o Possible reluctance to admit Medicare patients or certain groups of Medicare patients. o Increased rate of hospital closings, particularly in underserved areas.

These considerations require that a great deal of caution be exercised in attributing positive or negative effects to PPS. However, while the attribution of these effects is clearly a major objective of the PPS evaluation effort, its importance should not be overstated. PPS has as its objective the accomplishment of certain desirable changes in the health care system. To the extent that those changes are, in fact, observed, the Medicare program and its beneficiaries can be judged to be better off under the new system—regardless of whether this improvement may be conclusively attributed to any one policy. To the extent that undesirable effects are observed, a problem may be indicated—again, irrespective of the ability to attribute these effects to any one policy. Thus, it may not be necessary to know with certainty that PPS is the cause of the observed changes to be able to develop appropriate policy conclusions, at least in the short run.

The short-run approach taken in this series of reports is to identify the changes occurring in the health care system and to relate them to the hypothesized impacts of PPS represented in the PPS Study Issues Matrix. At the same time, the development of data sources and methodology necessary to obtain more conclusive findings on the attribution of the observed changes will be pursued as a long-run approach.

Data Sources

The major source of data for this report is the Medicare statistical system. The Health Care Financing Administration (HCFA) collects a rich body of data associated with the utilization and cost of inpatient hospital services and other in-hospital and ambulatory care services covered by Medicare. Among the files most useful in the analysis of the impact of PPS are:

- The Medicare Provider Analysis and Review (MedPAR) file, which contains selected billing, demographic, and provider information on all Medicare hospital stays;
- The Hospital Cost Report Information System (HCRIS), which is a national data base of hospital financial and statistical data generated from the Medicare cost reports;
- The Part B Medicare Annual Data (BMAD) system, which consists of four files containing data on procedures covered under Medicare Supplementary Medical Insurance (SMI), the prevailing charge limits for each service, the claims history of a sample of providers, and the claims history of a sample of beneficiaries, respectively; and
- The Health Insurance Skeleton Eligibility Write-Off (HISKEW) file, which contains entitlement data for all Medicare beneficiaries.

HCFA is currently constructing a comprehensive, integrated data base composed of the above files and other data from the Medicare statistical system and other sources to support future analyses of the impact of PPS.

Several other HCFA data files maintained or produced by HCFA have and will be used to support specific PPS impact analyses. These include:

- The Medicaid Statistical Report on Medical Care, which consists of data submitted annually by each State; and

- The PRO Medical Review Activity Report, which consists of data describing the operations of the 54 Utilization and Quality Control Peer Review Organizations (PROs).

In addition, HCFA actuarial data provide estimates of national health care expenditures by type of payer and Medicare benefit payments by type of provider.

Additional sources of data for the PPS evaluation are provided by HCFA-supported contract and grant research activities. These activities have provided many of the analyses of the impact of PPS, as well. Finally, where appropriate, sources of data outside of HCFA are used, including other Government sources, such as the National Center for Health Statistics, and sources in the private sector, such as the American Hospital Association.

Since the objective of this report is to describe and analyze the impact of PPS during its second year (FY 1985), an attempt has been made to incorporate the most recent data available at the time that the analyses were conducted. For some of the analyses, including most of the hospital-level analyses, data on FY 1985 were available in at least preliminary form. For many of the analyses, however, including most of the beneficiary-level analyses, data were not yet available for FY 1985, so FY 1984 data were used. Future reports will update these analyses, as the data permit.

Findings[1]

Impact on Hospitals

Overall, the evidence is clear that hospitals are responding to the new health care environment that is facing them. The decline in Medicare admissions that coincided with the introduction of PPS was the first in the history of the program, but it may be a reflection of a longer-term downward trend in overall hospital admissions. Average length of stay for Medicare patients has also declined dramatically since the implementation of PPS—more steeply by far than in any previous period—indicating that this decline is very likely a consequence of the new system. However, there are signs that the decrease in length of stay at PPS hospitals is leveling off. The number of staffed beds is also falling—the first prolonged downward trend since information has been collected by the AHA on this indicator—but not as rapidly as utilization levels, resulting in decreasing occupancy rates at the nation's hospitals.

Hospitals may be dealing with sicker Medicare beneficiaries than they were before the implementation of PPS, if the Medicare Case Mix Index (CMI) is taken as a measure of severity. However, there is strong evidence that a large portion of the increase in the CMI is accounted for by coding changes, rather than by real increases in severity.

There is also indirect evidence that Medicare beneficiaries are sicker when they leave the hospital than they used to be—an outcome that was expected, given the emphasis on shifting the locus of care from the hospital to other (perhaps more

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[1]For notational simplicity, references to the Federal fiscal year in this report will use the abbreviation "FY" preceding the year number (e.g., FY 1985); references to the calendar year will simply use the year mumber (e.g., 1985).

appropriate) settings. Medicare discharges to home (self-care) have decreased, while Medicare discharges to home health agencies (HHAs) have increased. Transfers from acute care hospitals to other types of facilities (predominately psychiatric and rehabilitation facilities, not included in PPS) have also increased, although transfers between acute care hospitals have not.

These changes in hospital behavior have not come at the expense of hospitals' financial status, at least not thus far. Payments substantially exceeded operating costs for PPS cases in every group of hospitals during the first year under prospective payment. Most of the improvement in financial position was accounted for by hospitals' ability to keep their operating costs below the hospital-specific rate targets set under PPS. The overall financial status of hospitals has, in fact, been improving over the last several years, and the implementation of PPS has not reversed this trend.

There is also evidence that the degree of financial pressure faced by individual hospitals affected the strength of their response. Hospitals facing the greatest potential loss of revenue under PPS (relative to cost-based reimbursement) had the greatest decreases in average length of stay and the smallest increases in Medicare cost per case under PPS.

Specific Findings:

- The number of Medicare short-stay hospital admissions decreased by 5.3 percent in FY 1985. This followed a decrease of 1.5 percent in FY 1984, which was the first in the history of the Medicare program. The rate of admissions per thousand Medicare enrollees decreased by 7.2 percent in FY 1985.

- The average length of stay for Medicare patients in short-stay hospitals fell by 7.7 percent in FY 1985. Although Medicare average length of stay has continually fallen since the program began, this was the second largest decrease in the program's history—exceeded only by the 9.0 percent decrease in FY 1984, the first year of PPS.

- There is evidence, however, that the effect of PPS on length of stay may be leveling off—at least temporarily. A comparison of PPS discharges only in FY 1984 and FY 1985 shows that length of stay for these cases fell by only 1.3 percent. More recent data indicate that the average length of PPS stays may, in fact, have increased in FY 1985.

- The number of staffed beds in the nation's hospitals was steadily decreasing between the third quarter of 1983 and the end of 1985, from slightly over one million to fewer than 975 thousand. This was the first prolonged downward trend in staffed beds since records have been kept on this indicator.

- Despite the decrease in the number of staffed beds, occupancy rates continued to fall, from 72.2 percent in 1983 to 63.6 percent in 1985.

- The CMI rose by 8.4 percent between 1981 and FY 1984, with most of this increase attributable to coding practice changes.

- An analysis of FY 1985 data for hospitals under PPS indicates that the CMI has continued to rise, by 3.9 percent on average, during the second year of the new system.

- Additional payments made under PPS for exceptionally long or costly cases accounted for only 1.2 percent of total basic PPS payments during FY 1984, compared with the 2.2 percent that was anticipated. This was due to the fact that the steep decline in average length of stay under PPS was not accounted for in the original calculation of the criteria for outlier payment; as a result, the number of length of stay outliers was 60 percent lower than anticipated in FY 1984. The use of post-PPS data to establish the FY 1986 outlier payment criteria (delayed by the Congress to May 1, 1986) should help to solve this problem.

- About 3 percent of all PPS discharges during FY 1984 were outliers. The frequency of outlier cases was correlated with hospital size. High concentrations of outlier cases were observed among urban hospitals (3.5 percent), major and other teaching hospitals (4.5 and 3.7 percent, respectively), and proprietary hospitals (3.7 percent).

- The purely distributive effect of the outlier payment policy was relatively small. During the first year under the new system, PPS payments to large urban hospitals (0.3 to 0.4 percent) and major teaching hospitals (0.4 percent) were higher than they would have been if payments were based solely on the basic DRG rates, and PPS payments to small urban hospitals (0.3 percent) and small rural hospitals (0.4 to 0.6 percent) were lower. Hospitals in New England (0.9 percent) also benefitted from the outlier payment policy.

- The percentage of Medicare cases transferred between short-term hospitals was not significantly different in 1984 than would have been predicted from the pre-PPS trend (1.76 versus 2.00 percent). The proportion transferred to psychiatric and rehabilitation hospitals, etc., however, was significantly different from the pre-PPS trend (1.46 versus 1.04 percent).

- Hospitals' operating margins on PPS cases during the first year under prospective payment averaged $495 per case (16.4 percent over costs). Hospital groups with exceptionally high PPS operating margins were urban hospitals (18.2 percent)--especially large urban hospitals--and major and other teaching hospitals (23.3 and 19.4 percent, respectively), as well as hospitals in the Mid-Atlantic (20.5 percent), West North Central (17.9 percent), West South Central (17.5 percent), and Pacific (17.4 percent) regions.

- The proportion of hospitals with negative PPS operating margins was 19.5 percent, while the proportion with PPS operating margins of 20 percent or greater was 27.2 percent. Among urban hospitals, only 9.7 percent had PPS operating losses (including none of the large urban hospitals), compared with 28.8 percent of rural hospitals. Only 4.1 percent of major teaching hospitals had PPS losses (while 61.5 percent had PPS profits of 20 percent or greater), compared with 22.4 percent of non-teaching hospitals.

- Most of PPS operating margins for hospitals in the first year under prospective payment appear to be due the ability of hospitals to keep their costs below the hospital-specific rate targets set under PPS. The cost per PPS case was an average of 16.5 percent below the hospital-specific payment rate (which represents HCFA's estimate of the hospital's historical cost experience).

- A comparison of PPS payments based totally on regional versus national payment rates (including separate urban and rural rates) indicates that rural hospitals would benefit relative to urban hospitals under the national system. Non-teaching hospitals would benefit relative to teaching hospitals and proprietary and Government hospitals relative to not-for-profit hospitals. In addition, there would be substantial redistribution of payments across regions.

- The trend in recent years is toward increasing overall hospital operating margins. The average total revenue operating margin in 1984 was 6.2 percent, compared with 1.2 percent in 1973. This represented the 11th consecutive year in which total revenue operating margins had increased or remained constant. Data for FY 1985 indicate no deterioration in hospitals' financial status.

- Although the increase in Medicare revenue per case between 1982 and 1984 for hospitals under PPS during 1984 was about the same as that for hospitals still under TEFRA during 1984 (18.5 percent versus 17.7 percent), the increase in Medicare cost per case was less than half as great (7.6 percent versus 18.1 percent).

- Hospitals faced with greater potential loss of revenue under PPS (relative to cost-based reimbursement) had smaller increases between 1982 and 1984 in Medicare cost per case (3.2 percent for the group facing the most pressure versus 10.2 percent for the group facing the least pressure) and larger decreases in average length of stay (17.5 percent for the group facing the most pressure versus 11.1 percent for the group facing the least pressure).

Impact on Medicare Beneficiaries

The quality of care is measured in this report in terms of mortality rates and readmission rates. There is no evidence of any effect on mortality for beneficiaries as a whole or for particularly vulnerable subgroups, nor is there evidence of any increase in readmission rates.

So far, the evidence on beneficiary access to hospital care is too limited to support a definitive conclusion about the impact of PPS. What information we have suggests that, in general, access has not suffered.

The volume of hospital use per se is not a useful measure of access, because we have no basis on which to judge what level of hospital use is "appropriate," other than to note that PPS was implemented on the basis of a judgment that hospital use was excessive. Effects on access can be evaluated, however, by determining whether hospitals are cutting length of stay for the sicker patients (i.e., those who would have had an above average length of stay for their DRG in the absence of PPS), or whether they are reducing access disproportionately for the more vulnerable patient groups.

Data from FY 1984 indicate that the variance of lengths of stay within DRGs has not been substantially reduced under PPS. There is no evidence that the oldest elderly or minority beneficiaries or persons with end-stage renal disease (ESRD) have experienced disproportionate changes in hospital use. Disabled beneficiaries, however, did appear to experience disproportionately large reductions in use, particularly those under 45 years of age, who are predominantly persons who have been mentally retarded since childhood. There is no clear explanation for this decline. Future trends for this population will be monitored especially carefully.

Evidence from FY 1984 data indicates that total beneficiary liability for Medicare-covered hospital services (deductible and coinsurance) did not increase substantially under PPS. Although the deductible and coinsurance amounts were substantially higher, Medicare admissions and average length of stay decreased. The overall effect of PPS on the total out-of-pocket costs of Medicare beneficiaries is unknown at this time, because data on SMI copayments are not yet available and data on non-covered services are not collected by HCFA.

Specific Findings:

- In the period 1980-83, the discharge rate for the aged Medicare population in States included under PPS rose from 380 to 403 discharges per thousand enrollees—an average annual increase of 2.0 percent. In FY 1984, this rate fell by 3.5 percent, to 393 discharges per thousand. By contrast, the discharge rate for the aged in States with waivers from participation in PPS continued to rise in FY 1984, although at a slower rate than before the implementation of prospective payment.

- In FY 1984, the discharge rate among the disabled Medicare population in PPS States fell by 10.1 percent, compared with a 3.4 percent decline in the waiver States. Among the disabled, the group under age 45 had the greatest decline in discharge rate (18.3 percent).

- The discharge rate for the Medicare population with ESRD did not change much between FY 1981 and FY 1984.

- Average length of stay for the aged decreased from 9.2 to 8.3 days between FY 1983 and FY 1984. Average length of stay for the aged also decreased in the waiver States, but to a lesser extent. For the disabled and ESRD populations, the patterns in average length of stay were about the same as for the aged.

- The combination of the declining discharge rate and the accelerated decline in the average length of stay for the aged resulted in a 16.2 percent decrease in the rate of total days of hospital care per thousand aged enrollees during the first year of PPS. In the waiver States, there was a 4.8 percent decrease over the same time period.

- Total days of hospital care per thousand disabled enrollees decreased by 21.3 percent in PPS States during the first year of PPS, while the ESRD population experienced a 9.0 percent decline.

- Data for the aged population, disaggregated into smaller age groups and by sex and race, yield no evidence of systematic changes in the discharge rate or average length of stay. These findings indicate that high-risk groups such as the oldest old or minorities have not experienced disproportionate changes compared to other groups of beneficiaries.

- There were large changes in the discharge rate for certain DRG categories. However, changes in coding procedures and practices under PPS make it difficult to interpret DRG-specific pre/post-PPS changes.

- The question of whether some hospitals might use the mean length of stay for the DRG as the maximum stay allowed for the patients in that DRG cannot be

answered at this time. However, there is evidence on a national basis of considerable dispersion of cases within DRGs around the mean length of stay, and this dispersion is comparable to that observed prior to PPS.

- Prior to PPS, there was a downward trend in the basic mortality rate (total deaths per 100,000 population) for the aged—in 1968, this rate was 6,637 per 100,000, and by 1983, it had fallen to 5,130. In 1984, this rate fell to 5,100 per 100,000—well within projections based on pre-PPS trends.

- There was no evidence that the basic mortality rate for disabled beneficiaries increased as a result of PPS.

- Survival rates for ESRD beneficiaries on dialysis were stable during the period from 1980 to 1984.

- Post-admission mortality rates (deaths within 6 weeks of the first admission to a hospital) for the aged and disabled rose slightly in FY 1984, compared to 1983. Notably, this trend was reversed when the rate of deaths within 6 weeks of a hospital admission were calculated per enrollee, rather than per hospitalized enrollee. This likely reflects the decrease in the number of hospitalizations per enrollee for the aged and disabled in FY 1984, and the fact that the patients who were hospitalized during FY 1984 were probably more seriously ill on average than in 1983.

- Taken together, these measures of mortality provide no evidence that the quality of hospital care has declined during the first year of prospective payment.

- In FY 1984, the rate of increase in multiple hospitalizations (a second, third, etc. discharge within 30 days of an initial discharge) for the aged declined in both PPS and waiver states. The same finding holds when the period within 60 days of discharge is examined.

- There was no evidence of increased readmissions on the eighth and ninth days after an initial discharge, either—indicating that hospitals did not appear to defer readmissions to escape detection by the PROs, which, during FY 1984, reviewed all readmissions within 7 days.

- Data on hospital discharges by primary payer indicate that surgical lengths of stay, pre-operative and post-operative lengths of stay, percent of patients using intensive care units (ICUs) and cardiac care units (CCUs), and ICU and CCU lengths of stay all declined for both Medicare and non-Medicare patients in 1984. The reductions in these indicators were greater and more significant for Medicare than for non-Medicare patients.

- The rate of increase in the total liability for Medicare deductible and coinsurance amounts per enrollee grew from 12 percent in 1978 to 21 percent in 1982, and then declined to 7 percent in 1984.

- The rate of growth in beneficiary liability for services provided under Medicare SMI also decreased considerably between 1983 and 1984. This decrease likely reflects the impact of the freeze on physician reimbursements, the increase in assignment rates, and the decline in Medicare hospital admissions and average length of stay.

Impact on Other Payers for Inpatient Hospital Services

The introduction of PPS appears to have had the greatest effect on State Medicaid programs. Since 1981, when States obtained greater discretion in details of program design, many jurisdictions have changed Medicaid eligibility rules and payment methodologies. Medicare's PPS may have stimulated some of the new movement toward prospective payment for Medicaid inpatient hospital services, and certainly provided a model system that several States have built upon.

Private payers also appear to have been affected by the introduction of PPS. Possibly in response to the example set by Medicare's cost-containment efforts, or in an attempt to prevent providers from shifting costs to them, many were implementing or planning to implement DRG-based payment systems and undertaking many other initiatives to control health costs. These include second surgical opinion programs, the encouragement of ambulatory surgery, establishment of health maintenance organizations (HMOs), and increased involvement in preferred provider arrangements.

As a result of these private sector initiatives, or simply due to more effective cost control by providers, the growth rate of utilization and costs for both Medicaid and private payers—especially for hospital services—has decreased.

Costs do not appear to have been shifted from Medicare to private payers, and private insurers do not appear to have suffered financially. Private health insurance expenditures for hospital care increased at less than one-third the rate of Medicare expenditures in 1984. While the growth rate of private health insurance premiums has declined in recent years, the growth rate of health insurance benefit payments has declined more steeply.

It is not yet clear how PPS has affected prepaid group health plans, HMOs, and other types of alternative payment and delivery systems. In 1984, prepaid health

plans showed the largest premium growth of any form of private health insurance, but their total benefit and hospital benefit payments also grew most rapidly.

Specific Findings:

- Medicare expenditures for hospital care rose by 9.6 percent between 1983 and 1984, compared with 2.8 percent for private third-party payers. Of all the sources of hospital care expenditures, only the States' share of Medicaid hospital expenditures grew faster, at 11.7 percent.

- By September 1985, 34 States had adopted prospective (although not necessarily DRG-based) Medicaid payment systems. Of these States, 20 set rates on a provider-specific basis and 14 set rates for peer groups of hospitals.

- By December 1986, it is expected that 16 States will be using DRG-based Medicaid payment systems.

- Medicaid inpatient hospital utilization decreased in 1984, while total Medicaid recipients increased slightly.

- In the period shortly before and after the implementation of PPS, Blue Cross plans initiated a number of cost-containment efforts, such as second surgical opinion programs, encouragement of ambulatory surgery, and preferred provider arrangements, as well as expanding Blue Cross-sponsored HMOs. In addition, some plans have adopted prospective payment systems.

- Between 1983 and 1985, Blue Cross/Blue Shield's share of the private health

insurance market fell from 34.3 to 31.1 percent. However, the Blue Cross/Blue Shield share of hospital benefits paid rose slightly, from 40.1 to 40.8 percent, during that period.

- During the seven quarters prior to the implementation of PPS, hospital days per thousand Blue Cross/Blue Shield members decreased at an annual rate of 2.2 percent; during the six quarters following PPS, this rate of decrease accelerated to 8.8 percent. As a result, hospital payments per thousand members has decreased at an annual rate of 0.3 percent in the post-PPS period, compared with an annual rate of increase of 10.3 percent prior to PPS.

- The rate of growth of outpatient visits per thousand Blue Cross/Blue Shield members has slowed from 3.6 to 2.7 percent since PPS, but the growth in outpatient payments per thousand members has remained about the same.

- The market share of the commercial insurers decreased between 1983 and 1985, from 42.7 to 41.3 percent. Their share of hospital benefit payments fell from 40.6 to 36.0 percent.

- Private health insurance benefit payments have increased more slowly since 1983 than at any time in the past decade, with benefit payments for hospital care increasing by only 2.6 percent in 1984 and 5.1 percent in 1985. At the same time, the growth rate of premiums has also slowed, but not as sharply.

- Prepaid health plans grew by 18.7 percent between 1984 and 1985. This was second only to self-insured plans among types of private health insurance. As a result, their market share increased from 6.5 to 7.0 percent of total premiums.

The ratio of the change in their benefit payments to the change in their premiums was the highest for any private payer in 1985.

Impact on Other Providers of Health Care

The share of Medicare payments for care in settings other than hospital inpatient has increased since PPS was implemented—an increase that is clearly attributable to the new system. The most rapid increases were in outpatient care and aftercare. The share of Medicare dollars going to doctors has not increased as sharply, probably due to the fee freeze imposed on physicians rather than to PPS.

Hospital outpatient revenue appears to have increased under PPS, primarily because more (and more expensive) surgical procedures are now being done in an outpatient setting.

There is evidence that both medical and surgical procedures are being moved from in-hospital and outpatient settings into doctors' offices—a move that may be due in part to PPS and in part to a more general long-run trend in practice patterns. A survey of physicians indicates that hospitals are indeed encouraging practice pattern changes under PPS. The vast majority report that they have felt pressure to discharge patients earlier and to reduce the use of ancillary services.

The supply of all types of aftercare—HHAs, skilled nursing facilities (SNFs), and swing beds—is up. This may be due to a series of recent policy developments rather than to PPS. But it is a most fortuitous development, given the greater demand for aftercare that is expected to be stimulated by PPS. The greatest increase in supply is among hospital-based aftercare providers.

Specific Findings:

- Covered charges for outpatient hospital services increased by 12.1 percent during 1984. This was the smallest increase in the past decade. The real value (adjusted for inflation) of covered charges per enrollee doubled, however, from 1975 to 1984.

- The number of outpatient hospital clinic and emergency room visits decreased in 1984, for both Medicare patients (by 7.6 and 1.2 percent, respectively) and all patients (by 4.2 and 0.1 percent, respectively). This finding is contrary to the expected shift in hospital services from the inpatient to the outpatient setting.

- There has, however, been an increase in "other" hospital outpatient visits (including diagnostic, therapeutic, and ancillary services) at community hospitals, from 107.4 million in 1983 to 112.9 million in 1984. The number of Medicare beneficiaries receiving hospital outpatient services other than emergency room or clinic visits also increased, slightly.

- There is evidence of shifts in the location of services. The share of medical services in the office under Medicare SMI increased from 49.5 percent in 1983 to 55.4 percent in 1985. The share of surgical procedures provided in the office also increased, from 55.4 to 60.6 percent.

- The share of surgical procedures provided under Medicare SMI in the outpatient setting also increased, from 5.9 percent in 1982 to 10.4 percent in 1985. The data also indicate that more complex (or at least more expensive) surgery is

being done on an outpatient basis: the share of charges for surgery provided under Medicare SMI in the outpatient setting increased from 3.3 percent to 20.5 percent between 1982 and 1985—an increase almost four times as great as the increase in the number of procedures.

- Physicians are apparently feeling some pressure to change their in-hospital practice patterns. In a survey of physician practice costs and incomes, more than half of the radiologists, anesthesiologists, and pathologists responding indicated that they felt pressure to conduct fewer procedures, limit the use of diagnostic testing, and do testing on an outpatient basis. Physicians in other specialties reported that they felt pressure to discharge patients sooner.

- A survey of organizations in the blood banking field indicates that they anticipate more efficient and effective resource use as a result of PPS. They predict successful adaptation to the new system, the main effect of which will be to intensify the cost containment mechanisms already in place. They do not foresee effects on sources of whole blood, although some blood products may become more difficult to obtain.

- Data on discharge destinations for Medicare and non-Medicare patients indicate that the percentage of Medicare patients discharged to home decreased from 83 percent in 1982 to 80 percent in 1984—significantly below the pre-PPS trend. There was no change in the trend for non-Medicare patients.

- The percentages of Medicare patients discharged to SNFs and HHAs increased from 7.8 to 8.5 percent and from 3.5 to 5.4 percent, respectively, between 1983 and 1984.

- The number of Medicare covered SNF admissions increased by 7.7 percent in 1984. However, the number of covered days per covered admission decreased from 29.2 to 26.6 (8.9 percent).

- The number of persons served by HHAs increased by 12.2 percent between 1983 and 1984, down slightly from the 13.7 percent annual rate of growth between 1980 and 1983. The number of visits per person served remained constant at 27 between 1983 and 1984.

- The number of Medicare-certified SNFs increased from 5,197 to 6,652 between 1981 and 1985. The number of Medicare-certified SNF beds decreased between 1981 and 1985, but this probably has little effect on the availability of skilled nursing care to Medicare beneficiaries, since the Medicare occupancy rate for these beds is only about 6 percent.

- However, there is wide variation in the availability of skilled nursing care by State. Over 50 percent of all Medicare certified SNFs are located in seven States: California, New York, Pennsylvania, Ohio, Florida, Illinois, and Michigan.

- The number of hospital-based SNFs or intermediate care facilities certified for Medicare, Medicaid, or both increased by 17 percent between 1981 and 1984, when there were 893 such facilities. The number of certified beds in these facilities increased by 15 percent during the same period, to 77,750. This may mean improved access for Medicare beneficiaries, since hospital-based facilities account for 20 percent of Medicare SNF patient days, but only 10 percent of beds in Medicare certified SNFs.

- The number of Medicare-certified HHAs increased by about 5 percent a year between 1972 and 1983 and about 20 percent a year between 1983 and 1985, numbering 5,964 in 1985.

- Proprietary and private non-profit agencies have increased their share of the HHA market from 5.5 percent in 1972 to 46 percent in 1985. This may have implications for Medicare expenditures, since these agencies have higher charges (and, presumably, costs) than public and voluntary non-profit agencies.

- Between 1982 and 1984, the average number of full-time equivalent personnel employed by HHAs increased by almost 50 percent, from 19.2 to 29.7. The skill mix of these personnel has also changed, as with tremendous increases in the number of licensed practical nurses (289 percent), occupational therapists (275 percent), and speech pathologists/audiologists (333 percent) in that same period.

Impact on Medicare Program Operations and Expenditures

PPS is essentially in place, with some 80 percent of all Medicare hospitals participating. During FY 1986, hospitals in two additional States (Massachusetts and New York) will be included in the nationwide system. The PRO program has been implemented in an attempt to increase the intensity and effectiveness of medical review of the appropriateness and quality of care. Contracts have been signed to establish PROs in all 54 specified PRO areas, and a large volume of cases have been reviewed by these organizations. Moreover, as the new system develops, the PROs' objectives will be tailored to meet special problems that may arise. In addition, HCFA has established a system for the review of PRO performance, including the

contracting of PRO monitoring activities to an independent reviewer, or SuperPRO, to ensure that the PROs are carrying out their crucial mandate.

Medicare program expenditures, as expected, show the effects of PPS. Medicare inpatient hospital benefit payments have grown under PPS at only a fraction of the pre-PPS rate. This reduction in the growth of hospital payments has not been counterbalanced by increased growth in payments to other providers. Real payments per Medicare beneficiary have grown only half as fast as they did in the early 1980s.

One note of concern is that this reduced payment growth has not eliminated the threat of insolvency. Projections indicate that the HI Trust Fund may still become insolvent by early in the next century.

Specific Findings:

- As of September 30, 1985, about 80 percent (5,343) of all Medicare hospitals were participating in PPS. This is an apparent decrease since the first year (5,405 hospitals), due primarily to an increase in the number of hospitals qualified for exclusion from PPS. Some increase in excluded hospitals is to be expected, as the process of defining and granting exclusions is refined. The largest group of excluded hospitals is the psychiatric hospitals (481 in FY 1985).

- The PROs, viewed as an integral part of the quality and utilization monitoring function under PPS, have reviewed 4.75 million PPS admissions since the beginning of the new system. Of these, 43,000 were transfers within hospitals to excluded units, 101,000 were transfers to non-PPS hospitals, 265,000 were readmissions within 7 days of discharge (3 percent disallowed), 66,000 were

cases involving pacemaker insertions (1 percent disallowed), 133,000 were cases involving other procedures (3.1 percent disallowed), 192,000 were outliers (120,000 length of stay and 72,000 cost), and 3.2 million were cases involving validation of the assigned DRG.

- PPS appears to have slowed the rate of increase of incurred Medicare inpatient hospital benefit payments. Although the increase (5.5 percent) in FY 1985 was still above the general rate of inflation, it represents a downturn in the rapid growth of hospital payments that was seen as a major threat to the solvency of the Medicare Trust Funds.

- Incurred outpatient hospital benefit payments appear to be increasing more rapidly under PPS than they were during the period from FY 1977 to FY 1982, before the cost-containment provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) took effect. The PPS and pre-TEFRA growth rates are 13.5 and 9.1 percent, respectively, in real terms (i.e., adjusted for the general rate of inflation). This may indicate that some of the savings from PPS are being spent on outpatient services.

- Incurred physician benefit payments have increased at a rate far less than their pre-TEFRA rate (6.7 versus 9.0 percent, in real terms). This is probably due, however, to the freeze in Medicare payment rates for physicians in 1984-85, as well as the decline in Medicare hospital admissions and length of stay under PPS.

- Incurred skilled nursing benefit payments have comprised a steadily decreasing portion of overall Medicare benefit payments over the past 11 years, dropping from 2.23 to 0.87 percent of the total between FY 1974 and FY 1985.

Payments for skilled nursing services have grown at a slower rate than any other major component of Medicare.

- The share of incurred home health benefit payments has risen rapidly, from 0.85 percent in FY 1967 to 3.46 percent in FY 1985. Home health has consistently been the fastest growing component of Medicare benefits over the past 10 to 12 years. How this relates to the anticipated increase in the demand for home health services under PPS is unclear at this time.

- The overall level of incurred Medicare benefit payments is increasing at a slower rate than it was before the implementation of prospective payment (5.2 versus 7.6 percent, in real terms). This results from a sharp decline in the growth rate of incurred HI payments (from 7.3 to 3.5 percent, in real terms), while the growth rate of incurred SMI payments stayed at approximately its pre-TEFRA level (8.9 versus 8.4 percent, in real terms).

- Incurred Medicare benefit payments per beneficiary have increased at a rate of only 3.4 percent per year during PPS period—about 50 percent slower than before TEFRA.

- Intermediate projections by HCFA's Office of the Actuary indicate, however, that the HI Trust Fund may still become insolvent by the year 2002 - 2005.

Conclusions

The data presented in this report support several conclusions about PPS in its second year. First, the new system has been implemented fairly smoothly. Second, the implementation of PPS does appear to be affecting the way that hospitals operate—length of stay is down (although this trend may be leveling off at PPS hospitals), costs are down, and practice patterns appear to be changing. Third, hospitals in general appear to have reaped the benefits of their cost-cutting behavior in the form of large operating margins, although there are some hospitals that are not doing well. Fourth, the growth rate of Medicare hospital costs does seem to be decreasing under prospective payment.

It also seems clear that the change in hospital behavior is having an effect now, and will probably have an increasing effect over time, on the other actors in the health care system—Medicare beneficiaries, other payers for inpatient hospital services, and other providers of health care. As time passes, these effects will become clearer, both because the parties involved will have had a chance to develop their responses to the new health care environment and because health services researchers both within and outside of the Government will have had additional opportunity to develop data sources and analytic methods that enable them to more accurately assess the impact of the system.

That is the purpose of the future reports in this series: to update the information presented in this report, to monitor the system as it develops for additional study issues that may become relevant, and to develop the data sources and methodology appropriate for the investigation of the issues that have not yet been addressed.

REFERENCES FOR EXECUTIVE SUMMARY

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1984 Annual Report. Washington, D.C.: 1985.

Chapter 1

INTRODUCTION

Purpose

This is the second in a series of annual reports to be prepared by the Department of Health and Human Services (DHHS) to describe and assess the impact of the Medicare Hospital Prospective Payment System (PPS). PPS was enacted by the Congress in the Social Security Amendments of 1983 (Public Law 98-21). Section 603(a)(2)(A) of that legislation requires the Secretary of Health and Human Services to:

> "...study and report annually to the Congress at the end of each year (beginning with 1984 and ending with 1987) on the impact, of the payment methodology under Section 1886(d) of the Social Security Act during the previous year, on classes of hospitals, beneficiaries, and other payors for inpatient hospital services, and other providers, and, in particular, on the impact of computing DRG prospective payment rates by census division, rather than exclusively on a national basis."

Each annual report is also to include recommendations for such changes in legislation as the Secretary deems appropriate.

Section 9305(i)(1)(A) of the Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509) extended the mandate for these annual reports through 1989.

In response to this Congressional mandate, DHHS has undertaken a major effort to evaluate the new payment system. This evaluation effort has been designed and implemented with the following objectives in mind:

- To conduct a systematic evaluation of a policy change that promises to have a dramatic effect on the entire health care system;
- To describe the behavioral changes occurring among the institutions and individuals that provide and utilize health care, particularly among Medicare providers and beneficiaries;
- To assess the impact of the new payment system on the Medicare program itself, particularly on its fiscal solvency; and
- To determine, to the extent possible, the degree to which PPS is responsible for the changes that are being observed since its implementation.

The requirement for an annual series of reports reflects recognition of the fact that the impact of PPS cannot be conclusively evaluated at one point in time. Until the new system has been fully implemented and the affected parties have had sufficient time to respond, its ultimate effects will not be clear. In addition, the research objectives listed above can only be accomplished over a period of time long enough to allow for the development of both the data sources and methodology appropriate for the task.

The first report in this annual series (U.S. Department of Health and Human Services, 1985) was devoted primarily to a discussion of the development and major

features of PPS, an outline of the methodological approach to be taken in evaluating its impact, and a presentation of early descriptive data on the performance of the health care sector during the first year of PPS's implementation.

This year's report is intended to update the information presented in the first report and to address several additional issues that could not be addressed in that report. Data from sources not available last year are included in this report, as well as the results of several studies that were in their initial or planning stages at the time that the previous report was written.

Because of the interim nature of the findings available at this time, no legislative recommendations are included in this report. Legislative recommendations on particular aspects of the payment system can and will be submitted by the Department as they are needed.

Related Studies

Section 603(a)(1)(C) of the Social Security Amendments of 1983 (Public Law 98-21) lists several studies on issues related to PPS that are to be included in the 1985 annual report:

- The feasibility and impact of eliminating or phasing out separate urban and rural payment rates;
- Prospective payment of hospitals currently excluded from PPS;
- The appropriateness of outlier payment under PPS and the advisability and feasibility of refinements to the DRGs;
- The feasibility and desirability of applying the prospective payment methodology to all payers for inpatient hospital services; and

- The impact of PPS on hospital admissions and the feasibility of making a volume adjustment in the PPS payment rates or requiring pre-admission certification in order to minimize the incentive to increase admissions.

Due to the substantive nature of each of these issues, they have been conducted as separate studies and have been or will be submitted under separate cover.

Methodological Approach

Context

The change from cost-based reimbursement to prospective payment represents a fundamental change in the role of the Medicare program within the health care system. Rather than reimbursing the hospital for actual costs incurred, PPS allows the Federal Government to become a more prudent purchaser of hospital care by paying a fixed price for a known and defined product—the hospital stay. PPS is designed to change hospital behavior by directly altering the economic incentives facing hospital decision makers.

PPS is intended to encourage a shift in the thinking of hospital administrators away from the concept of numerous hospital cost centers (e.g., laboratory, pharmacy, etc.) and toward improved coordination of the services provided during the hospital stay, so that care can be provided more efficiently and the increase in hospital costs curtailed.

Hospitals' responses to the incentives facing them under PPS can be expected to have a far-reaching effect on the other groups of institutions and individuals that provide, consume, and pay for health care in this country. Medicare beneficiaries are obviously affected by the new payment system, as the quality of the care that

they receive, their access to the care that they need, and their out-of-pocket costs for care provided both in the hospital and in other settings are determined by hospitals' responses to PPS incentives.

Other payers for inpatient hospital services may also be affected, as they attempt to avoid a potential shifting of hospital costs from Medicare patients to their own patients and as they respond to the example set by the PPS cost-containment approach. Among other providers of health care, physicians may be affected both as practitioners within the inpatient setting and as providers of potential substitutes for inpatient care, while providers of post-hospital sub-acute care (aftercare) may feel the effects of PPS through an increase in the volume and complexity of services demanded from them. Finally, the effect of the new payment system on the Medicare program itself is important, since the maintenance of the fiscal solvency of the Medicare Hospital Insurance Trust Fund was the primary impetus for the enactment of PPS.

PPS Study Issues

The issues involved in evaluating a policy initiative as revolutionary and far-reaching as PPS are numerous and complex. Each of the major groups participating in the health care delivery system has its own set of objectives—some of them complementary and some in direct conflict with each other. In turn, each set of objectives can be expected to result in a predictable set of responses to a given change in the health care environment.

In order to assess these responses and their observed outcomes in a logical and comprehensive manner, assumptions about the incentives facing each group

Table 1.1
PPS STUDY ISSUES MATRIX

	Hypothetical Impact on Hospitals	Hypothetical Impact on Beneficiaries
Economic Impact		
--Anticipated Benefits:	o Shorter inpatient stays. o Fewer unnecessary days and services. o More specialization in efficiently provided services. o Better coordination of outpatient, inpatient, and post-hospital care, through improved discharge planning. o Reduction in excess capacity. o Adoption of cost-reducing technology. o Increased price competition among providers of supplies and equipment. o Application of improved management practices.	o Part A liability limited to legal deductible and coinsurance amounts.
--Other Potential Consequences:	o Increases in unnecessary admissions, readmissions, and transfers. o Increases in hospital case mix, due to changes in coding procedures ("DRG creep"). o Separate provision of services that were traditionally considered part of routine inpatient care ("unbundling"). o Increase in cases with exceptionally lengthy stays or high costs (outliers), due to additional outlier payments. o Underpayment of hospitals that tend to treat cases that are more severely ill or that require more intensive care. o Reductions in hospital staffing levels. o Diminished hospital financial performance, particularly among certain groups of hospitals.	o Higher deductible and coinsurance amounts, if length of stay decreases more rapidly than cost per case. o Higher out-of-pocket cost for non-hospital services, as care is shifted to outpatient and office settings and utilization of post-hospital care increases.
Impact on the Quality of Care		
--Anticipated Benefits:	o Reduction in the risk of nosocomial infection and other iatrogenic events, as lengths of inpatient stays decrease. o Fewer unnecessary tests and services. o Specialization in services most efficiently and effectively provided. o More selective and effective use of new technology.	o Reduction in the risk of nosocomial infection and other iatrogenic events, as lengths of inpatient stays decrease. o Fewer unnecessary tests and services. o Specialization in services most efficiently and effectively provided. o More selective and effective use of new technology.
--Other Potential Consequences:	o Increase in unnecessary admissions. o Reductions in necessary tests and other ancillary services. o Tendency toward premature discharges. o Reluctance to adopt quality-enhancing (but expensive in the short run) technology.	o Reductions in necessary tests and other ancillary services. o Decrease in necessary inpatient physician consultations. o Tendency toward premature discharges.
Impact on Access to Care		
--Anticipated Benefits:	o Improved coordination of outpatient, inpatient, and post-hospital care. o Shifting of services to more appropriate (and inexpensive) settings.	o Improved coordination of outpatient, inpatient, and post-hospital care. o Shifting of services to more appropriate (and inexpensive) settings.
--Other Potential Consequences:	o Reluctance of hospitals to accept patients who present greater risk of financial loss ("skimming"). o Tendency to transfer patients who are associated with high costs or an inability to pay for their care to other hospitals ("dumping").	o Reluctance of hospitals to accept patients who present greater risk of financial loss ("skimming"). o Tendency to transfer patients who are associated with high costs or an inability to pay for their care to other hospitals ("dumping"). o Lack of appropriate post-hospital care, as more severely ill patients are discharged earlier ("sicker and quicker") from inpatient care.

Table 1.1
PPS STUDY ISSUES MATRIX
(cont.)

	Hypothetical Impact on Other Payers	Hypothetical Impact on Other Providers
Economic Impact		
--Anticipated Benefits:	o Rapid diffusion of prospective payment and other innovative payment methodologies. o Increased cost consciousness among all payers and providers, resulting in cost savings for payers, providers, and consumers.	o Increased provision of health care in less expensive non-hospital settings. o Improved coordination of outpatient, inpatient, and post-hospital care.
--Other Potential Consequences:	o Potential shifting of cost burden to other payers for hospital inpatient services, with resulting increases in health insurance premiums and/or reductions in benefits. o Increase in the economic consequences of uncompensated care, as the burden for payment of that care is shifted to other payers and/or providers.	o Inappropriate shifting of hospital treatment to outpatient settings. o Pressure on physicians to inappropriately alter their practice patterns. o Too few in-hospital physician consultations. o Increase in the volume and complexity of services required by more severely ill patients discharged earlier ("sicker and quicker") from inpatient to post-hospital care.
Impact on the Quality of Care		
--Anticipated Benefits:	o Improved coordination of health care treatment, payment, and coverage.	o More efficient patient management. o Improved coordination of outpatient, inpatient, and post-hospital care.
--Other Potential Consequences:	o Competing incentives to health care providers treating patients with different types of coverage.	o Too few in-hospital physician consultations. o Inappropriate shifting of hospital treatment to outpatient settings. o Inability of post-hospital care providers to meet the greater and more complex care requirements by more severely ill patients discharged earlier ("sicker and quicker") from inpatient care.
Impact on Access to Care		
--Anticipated Benefits:	o Reduced health care charges and insurance premiums. o Improved coordination of health care treatment, payment, and coverage.	o Increased availability of services in (less expensive) non-hospital settings. o Improved coordination of outpatient, inpatient, and post-hospital care.
--Other Potential Consequences:	o Decreased coverage of indigent patients and other uninsured or underinsured patients who are unable to pay for health care.	o Longer backlogs of patients awaiting post-hospital care. o Obstacles to providing a continuum of health care, due to certificate of need restrictions, contracting prohibitions, etc.

Table 1.1
PPS STUDY ISSUES MATRIX
(cont.)

	Hypothetical Impact on the Medicare Program
Economic Impact	
--Anticipated Benefits:	o Slower rate of growth of hospital expenditures. o Improvement in solvency of the program overall. o More predictable program outlays.
--Other Potential Consequences:	o Increased growth in expenditures for capital and other cost categories reimbursed on a "pass-through" basis. o Increased growth in expenditures on substitutes for inpatient hospital care. o Increased growth in expenditures for post-hospital care.
Impact on the Quality of Care	
--Anticipated Benefits:	o More efficient provision of both hospital and overall health care.
--Other Potential Consequences:	o Replacement of quality with financial considerations as the objective of health care providers.
Impact on Access to Care	
--Anticipated Benefits:	o Reduction in the cost of hospital care. o Encouragement of efficiency in the management of health care providers. o Promotion of the success of efficient providers of hospital care. o Improvement in the solvency of the program overall.
--Other Potential Consequences:	o Possible reluctance to admit Medicare patients or certain groups of Medicare patients. o Increased rate of hospital closings, particularly in underserved areas.

potentially affected by PPS have been used to derive a set of hypothesized impacts of the new system. These assumptions were based on the body of theoretical and empirical literature that existed at the time that PPS was enacted.[1] The resulting set of research hypotheses reflects the vision of the system and its anticipated effects represented in the objectives stated by the designers of the system, the policy goals underlying the legislation that enacted the system, and the incentives contained in the system as implemented. Several methodological studies conducted since PPS began have contributed to the development of additional research hypotheses.[2] Observations on the responses to the new system as it evolves will be evaluated in the context of these hypotheses, and will also be used to refine them.

Further discussion of the incentives provided by PPS and the anticipated response to these incentives is contained in Chapter 2. A list of hypothesized impacts of the new payment system on hospitals, Medicare beneficiaries, other payers for inpatient hospital services, and other providers of health care—as well as on the Medicare program itself—is presented in Table 1.1 as the PPS Study Issues Matrix. This matrix is intended to provide a framework for the evaluation of PPS over the next several years.

The impact measures listed in the PPS Study Issues Matrix are grouped into three general categories: economic impact, impact on the quality of care, and impact on access to care. Within each of these categories, there is a distinction

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[1]A discussion of the behavioral assumptions upon which PPS is based is contained in U.S. Department of Health and Human Services (1982).

[2]Among these are studies conducted by the Prospective Payment Assessment Commission (1986), U.S. Congress, Office of Technology Assessment (1985), and U.S. General Accounting Office (1986).

between the benefits anticipated under PPS and other potential impacts, which may be either beneficial or adverse to the group involved. This list is far from exhaustive, and is intended to be sufficiently flexible to allow for the incorporation of new hypotheses that may arise as the system evolves or the deletion of old hypotheses that become less important as additional information becomes available.

Attributing Causality

One of the major problems in evaluating PPS is that of attribution. It is difficult to draw strong causal inferences about the effects of the new system because of the rapidly changing nature of the health care sector. Many changes are occurring that might plausibly account for effects of the sort that are anticipated under prospective payment. For instance, PPS is but one of many public and private initiatives to control the cost of health care. Also, the rapidly increasing supply of physicians is likely to be an important influence on the effectiveness of efforts to contain health care costs. Thus, both desirable and undesirable effects that might be consistent with expectations about PPS may actually be caused by other factors or by the joint product of PPS and several other factors.

In addition, the nationwide scope of the new system precludes the existence of a natural "control," or comparison test, group. While four States were originally excluded from PPS, they were explicitly excluded on the grounds of participation in other cost-containment experiments. Thus, although they are sometimes used to compare trends over time, the waiver States do not constitute a true control group.

These considerations require that a great deal of caution be exercised in attributing positive or negative effects to one or another of the many changes occurring in the health care sector. However, while the attribution of effects is

clearly a major concern of PPS evaluation effort, its importance should not be overstated. PPS has as its objective the accomplishment of certain desirable changes in the health care system. To the extent that those changes are, in fact, observed, the Medicare program and its beneficiaries can be judged to be better off under the new system—regardless of whether this improvement may be conclusively attributed to any one policy. To the extent that undesirable effects are observed, a problem may be indicated—again, irrespective of the ability to attribute these effects to any one policy. Thus, it may not be necessary to know with certainty that PPS is the cause of the observed changes to be able to develop appropriate policy conclusions, at least in the short run.

The short-run approach taken in this series of reports is to identify the changes occurring in the health care system and to relate them to the hypothesized impacts of PPS represented in the PPS Study Issues Matrix. At the same time, the development of data sources and methodology necessary to obtain more conclusive findings on the attribution of the observed changes will be pursued as a long-run approach.

Data Sources

Medicare Statistical System

The major source of data for this report is the Medicare statistical system. The Health Care Financing Administration (HCFA) collects a rich body of data

associated with both Medicare Hospital Insurance (Part A) and Medicare Supplementary Medical Insurance (Part B). These data are generated for several purposes:

- To certify Medicare providers or suppliers;
- To verify the eligibility and/or deductible status of beneficiaries;
- To determine payment for the episode of care;
- To review the medical necessity and appropriateness of the care provided;
- To monitor the performance of the fiscal intermediaries and medical review entities;
- To provide descriptive program statistics; and
- To support program research, development, and evaluation.

In order to fulfill these multiple purposes, the data are organized into many different data files. The data files most useful in the analysis of the impact of PPS to date are the Medicare Provider Analysis and Review (MedPAR) file, the Hospital Cost Report Information System (HCRIS), the Part B Medicare Annual Data (BMAD) file, and the Health Insurance Skeleton Eligibility Write-Off (HISKEW) file.

The MedPAR file contains selected billing, demographic, and provider information on hospital stays for all Medicare beneficiaries. Prior to October 1983,

the MedPAR file only included a 20 percent sample of beneficiaries. For each hospital stay, data on diagnostic category, surgical procedures performed, length of stay, charges, and amount reimbursed are recorded. This file serves as a source for many of the patient-based analyses of the impact of PPS.

The HCRIS is a national data base of hospital financial and statistical data generated from the Medicare cost reports. These data include hospital characteristics, the number of admissions, discharges, and patient days for all patients, Medicare patients, and Medicaid patients, and revenues, charges, and costs overall and by cost center. This file is used to provide data on Medicare hospital revenues, costs, and net operating margins.

The BMAD system consists of four files: a procedure file, a prevailing charge file, a provider file, and a beneficiary file. These files contain, respectively, data on procedures performed under Part B, the prevailing charge limits for each service, the claims history of procedures rendered by a one percent sample of physicians, and the claims history of services received by all beneficiaries with end-stage renal disease (ESRD) and a five percent sample of other beneficiaries. These files are used to describe trends in the utilization and setting of Part B services.

The HISKEW file is a condensed version of the Health Insurance Master File, containing entitlement data for all Medicare beneficiaries. Each beneficiary's coverage under Parts A and B, along with selected demographic data, are listed on this file, which is updated each quarter. This file is used to measure Medicare enrollment levels, and is the most reliable source of data on the date of death for studies of mortality rates.

HCFA is currently constructing a comprehensive, integrated data base composed of the above files and other data from the Medicare statistical system and other sources to support future analyses of the impact of PPS. This file will link

claims and provider information across all Medicare covered short-stay hospital, physician, skilled nursing, and home health services to provide an internally consistent source of data for the PPS evaluation effort.

Other HCFA Data

Several other data files maintained or produced by HCFA have been used to support specific PPS impact analyses. The Medicaid Statistical Report on Medical Care consists of data submitted annually by each State, describing Medicaid enrollment, utilization, and payments. These data are used to analyze trends in Medicaid utilization and expenditures under PPS. Data on the operations of the 54 Utilization and Quality Control Peer Review Organizations (PROs) nationwide are provided by the PRO Medical Review Activity Report. Published estimates of national health care expenditures by type of payer and Medicare benefit payments by type of provider are obtained from HCFA actuarial data.

Data from HCFA Contractors and Grantees

Several additional sources of data for this report have been generated by HCFA-supported contract and grant research activities. Among these are the following:

- Hospital discharge abstract data from the Commission for Hospital and Professional Activities (CPHA) have been used to describe trends in the discharge destinations of Medicare and non-Medicare patients and to analyze several indicators of the quality of inpatient care.

- Data from a study of patient dependency at the time of hospital discharge by Northwest Oregon Health Systems have been used to provide preliminary findings on changes in dependency levels under PPS.

- The Blue Cross and Blue Shield Association has collected membership, utilization, and cost data from most of their member plans across the country, for use in the analysis of the impact of PPS and other cost-containment initiatives on the largest of the non-Federal payers for inpatient care.

- The Physician Practice Costs and Incomes Survey conducted by the National Opinion Research Center at the University of Chicago included questions addressed to both hospital-based and other physicians on the impact of PPS on their practice environments.

Additional data from these sources may be available for forthcoming reports, and several HCFA-sponsored activities now underway will expand this list in the future. In addition, the HCFA grants solicitation process encourages the submission of proposals for new PPS-related research, and so promises to increase the volume of activity devoted to the evaluation of PPS.

Other Data Sources

Data for the analyses contained in this report have been obtained from other sources, as well. The American Hospital Association (AHA) conducts a monthly survey of a panel of 1,600 hospitals, of whom about 1,200 respond in any given

month. This survey provides timely data on hospital admissions, length of stay, hospital revenues and costs, profit margins, and staffing levels. The annual survey conducted by the AHA is viewed as being more accurate, but is not available on as timely a basis as is the monthly survey.

Data on mortality trends are obtained from the National Center for Health Statistics (NCHS). These data serve as a check on the Medicare mortality data, and also provide a long-standing time series for the analysis of nationwide and age-specific mortality rates.

In This Report

Since the objective of this report is to describe and analyze the impact of PPS during its second year (FY 1985), an attempt has been made to incorporate the most recent data available at the time that the analyses were conducted. For some of the analyses, including most of the hospital-level analyses, data on FY 1985 were available in at least preliminary form. For many of the analyses, however, including most of the beneficiary-level analyses, data were not yet available for FY 1985, so FY 1984 data were used. Future reports will update these analyses, as the data permit.

Organization of the Report

This report is organized into two major parts. The first two chapters describe the background and design features of PPS, and the following five chapters provide current data on its implementation and impact.

Following this introductory chapter, which outlines the issues to be addressed, the methodology to be employed, and the major sources of data, Chapter 2 reviews the historical development of Medicare hospital payment, describes some of the design features of PPS, and discusses the incentives that are provided by prospective payment and the anticipated responses to those incentives.

Chapters 3 through 7 of this report present data on the impact of PPS on hospitals, Medicare beneficiaries, other payers for inpatient hospital services, other providers of health care, and Medicare program operations and expenditures, respectively. The emphasis is on describing and analyzing the changes observed since PPS was implemented in October 1983. The potential impacts that are investigated are reflected in the PPS Study Issues Matrix shown in Table 1.1.

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Chapter 2

THE MEDICARE PROSPECTIVE PAYMENT SYSTEM

Overview

The purpose of this chapter is to briefly trace the evolution of Medicare hospital payment from the origins of the program through the implementation of PPS, and to describe the system's current status in order to provide a context for the interpretation of the findings presented in Chapters 3 through 7.

The chapter begins with a description of the development of Medicare hospital payment, from the enactment of the Social Security Amendments of 1965 through the provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) and the creation of Medicare prospective payment by the Social Security Amendments of 1983. The major features of PPS are then reviewed, focusing on the types of facilities and services included in and excluded from prospective payment and the determination of the prospective payment rates. These features are updated through FY 1985. The concluding section is a discussion of the incentives provided by prospective payment, and the impact that these incentives are likely to have on the behavior of hospitals, Medicare beneficiaries, other payers for hospital care, and other health care providers.

The Development of Medicare Hospital Payment

Early Development

The Social Security Amendments of 1965 (Public Law 89-97) established Title

XVIII of the Social Security Act, which authorized the creation of the Medicare program to provide comprehensive health care coverage for most Americans over the age of 65. Part A of Title XVIII (Hospital Insurance (HI)) provides basic health insurance protection against the costs of inpatient hospital care and skilled nursing and home health care. Part B of Title XVIII (Supplementary Medical Insurance (SMI)) provides voluntary supplementary insurance covering most physicians' services and certain other items and services not covered under Part A.

The method of payment for hospital services that was adopted by the Medicare program was a retrospective cost-based reimbursement system, modeled after the private insurance practices that prevailed at the time. Under this system, hospitals were reimbursed for any reasonable costs that they incurred in the provision of covered care to Medicare beneficiaries. With the implementation of the Medicare program, there was a sharp increase in the utilization of health care services by the elderly, and a similarly sharp rise in health care costs. Between 1965 and 1967, Federal health care expenditures more than doubled.

The Social Security Amendments of 1967 (Public Law 90-248) authorized the Department of Health, Education, and Welfare (now Health and Human Services (DHHS)) to study the impact of extending benefits under the Medicare program to certain medically-disadvantaged groups, such as persons who are disabled and persons with end-stage renal disease (ESRD). In addition, DHHS was authorized to develop and test alternatives to retrospective cost-based reimbursement that might be more effective in controlling the rapid increase in Federal health care expenditures.

Between FY 1967 and FY 1971, Medicare hospital benefit payments doubled. Although this increase was due in large part to the improved access to health care provided by the program, it prompted both Federal and private researchers to

increase their efforts in the development of alternative hospital payment mechanisms that could increase control over costs while continuing to make health care available to a growing beneficiary population. The Economic Stabilization Program, put into effect in 1971 to temporarily suppress the inflation that was plaguing the economy in general, slowed the rate of increase in hospital costs somewhat.

Expansion of the Program

The Social Security Amendments of 1972 (Public Law 92-603) extended Medicare coverage to disabled workers and persons with ESRD, and permitted those persons aged 65 and over who were not otherwise eligible for HI to obtain this coverage by paying the full premium. At the same time, several utilization and quality control measures were mandated:

- Professional Standards Review Organizations (PSROs) were established, in an attempt to reduce the unnecessary utilization of hospital services while maintaining the quality of care;

- Health maintenance organizations (HMOs) were included among the entities recognized by the Medicare program, to take advantage of the reduced rate of hospital utilization demonstrated by these plans;[1] and

[1]Under this law, each HMO was to be reimbursed an amount based on a comparison of its own costs with the average cost of providing covered services to Medicare beneficiaries in the same geographic area with the same characteristics as its own enrollees. Under the provisions of TEFRA (see below), prospective payment under risk-sharing contracts with HMOs was authorized.

- DHHS was authorized in Section 223 of the 1972 Amendments to determine prospectively set limits on providers' reasonable costs, and to deny reimbursement to hospitals for costs exceeding these limits. The Department subsequently set per diem limits on routine inpatient operating costs by hospital group, defined according to location and size.

In addition, the 1972 Amendments mandated the expansion of research and experimentation in order to determine the advantages and disadvantages of making payments to Medicare providers on a prospective basis.

When the temporary Economic Stabilization Program was terminated in 1974, the rapid increase in hospital inpatient costs resumed. The National Health Planning and Resources Act of 1974 (Public Law 93-641) was enacted, authorizing the establishment of community health planning agencies and requiring hospitals to obtain a certificate of need (CON) for each capital project. This legislation also authorized DHHS to set limits on hospital charges and routine costs.

Between 1974 and 1977, Federal health care expenditures rose by more than 50 percent, to a level four times as high as it was when Medicare was implemented in 1967. Research and experimentation on cost-containment strategies were intensified: State rate-setting programs were proving more effective than cost-based reimbursement, while broader Federal regulations, represented by the PSROs and the CON requirement, appeared to have little impact. In 1977, Federal health care financing programs were consolidated under the newly-created Health Care Financing Administration (HCFA), which was made responsible for administering the Medicare and Medicaid programs and ensuring their quality and effectiveness.

In 1978, a system of voluntary cost-control efforts by the hospital sector reduced the rate of increase in hospital expenditures; however, these voluntary

controls proved to be only temporarily effective. By 1980, Medicare hospital expenditures were rising as rapidly as they had been before--and, as the proportion of elderly persons in the population continued to increase, the HI Trust Fund[2] was forecast to be in danger of insolvency by the end of the decade.

TEFRA

In response to the serious concerns about the solvency of the Medicare program, TEFRA (Public Law 97-248) contained several provisions aimed at increasing the program's control over its hospital payments. One of these provisions extended the hospital cost limits authorized by Section 223 of the 1972 Amendments, which had previously been applied only to routine inpatient operating costs, to cover the total operating costs of inpatient hospital services per Medicare discharge. Thus, the emphasis in Medicare payment was shifted from per-diem to per-case costs. The TEFRA cost limits were to take into account the diagnostic mix of Medicare cases treated at each hospital.

Another provision of TEFRA placed a limit for three years on the annual rate of increase in Medicare-reimbursable costs per discharge--providing for penalties for hospitals exceeding those limits and incentive payments for hospitals incurring operating costs below the target amounts.

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[2]The Medicare program is financed by two trust funds: Part A benefits are paid out of the HI Trust Fund, which is funded by the Medicare portion of the Social Security (FICA) tax deducted from the paychecks of eligible workers; Part B benefits are paid out of the SMI Trust Fund, which is funded by the premiums charged to the voluntary enrollees in this program, as well as an amount contributed from general tax revenues.

In addition, a system of 54 Utilization and Quality Control Peer Review Organizations (PROs) was established (one for each State, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam/American Samoa), to review health care services and items provided to Medicare patients, for the purpose of determining whether:

- Such services are reasonable and medically necessary;
- The quality of such services meets professionally recognized standards; and
- Services provided on an inpatient basis could be provided in an appropriate manner and more economically on an outpatient basis.

The PROs were to take the place of the PSROs that were then in existence, with increased authority and more emphasis on the quality of care.

DHHS was also required by the provisions of TEFRA to develop, in consultation with the Senate Committee on Finance and the House of Representatives Committee on Ways and Means, a legislative proposal for Medicare payment to hospitals, skilled nursing facilities (SNFs), and, to the extent feasible, other providers on a prospective basis. In partial response to this requirement, a proposal on hospital prospective payment for Medicare was submitted to the Congress in December 1982 (U.S. Department of Health and Human Services, 1982).

The Rationale for Prospective Payment

This brief sketch of the development of Medicare hospital reimbursement

indicates that, from very early on, it was apparent that cost control was one of the Medicare program's major shortcomings. Although some growth in Federal health care expenditures could be anticipated as a result of the improved access to care provided by Medicare and Medicaid, as well as several other factors that may not be undesirable from the program's point of view, the rate of cost increase far exceeded that which was anticipated or which could be considered acceptable.

The evolution of Medicare hospital reimbursement largely represents a series of attempts to increase control over these rapidly rising costs. However, from the earliest efforts to control Medicare costs through the enactment of the Section 223 and TEFRA cost limits, Medicare payment continued to be primarily based on retrospective cost reimbursement principles.

Since, under retrospective cost-based reimbursement, higher hospital costs generally resulted in larger hospital payments, there was no incentive for hospitals to operate more efficiently. The development of a prospective payment system for Medicare was predicated on the notion that the existing reimbursement principles could not be modified to a sufficient degree to effectively control costs, and that a fundamental change was needed.

As mentioned earlier, dissatisfaction with retrospective cost-based reimbursement was evidenced very early in the history of the Medicare program. The Social Security Amendments of 1967 authorized DHHS to develop and test alternatives to the existing payment system. Beginning in 1972, several demonstrations had been conducted for the purpose of evaluating a wide variety of alternative payment systems. These demonstrations established that mandatory prospective payment-type systems were generally effective in holding down the rate of increase in hospital costs. Ten years of experience with these demonstrations,[3]

[3] A summary of findings on the effects of these demonstrations is found in Coelen and Yaffee (1984).

and extensive research on the reform of the Medicare hospital payment system, indicated that prospective payment was a viable alternative to the retrospective cost-based reimbursement system then in effect.

The Social Security Amendments of 1983

The Social Security Amendments of 1983 (Public Law 98-21) provided for Medicare payment for inpatient hospital services under a prospective payment system, rather than the previous retrospective cost-based reimbursement system. Under the Medicare prospective payment system, payment is made at a predetermined, specific rate for each discharge, according to the diagnosis-related group (DRG) in which the discharge is classified. The prospective payment rate does not include capital-related costs (e.g., depreciation, taxes, rent, etc.) or direct medical education costs, which continue to be reimbursed on a reasonable cost basis.

The 1983 Amendments also modified the PRO program, extending its functions to include the review of:

- The validity of diagnostic and procedural information provided by hospitals;
- The completeness, adequacy, and quality of care provided;
- The appropriateness of admissions and discharges; and
- The appropriateness of care for which outlier payments (additional

payments for exceptionally long or costly cases) are made.

Each hospital was required by law to enter into a contract with the PRO for its State or area.

In addition, the 1983 Amendments required that certain demonstration projects be conducted to investigate alternative approaches to Medicare payment, and that several reports be submitted to the Congress on specified areas of study related to the impact, refinement, and extension of Medicare prospective payment.

Major Features of PPS

Applicability

PPS applies to all inpatient hospital services furnished by all hospitals participating in the Medicare program, except for hospitals participating in approved demonstration projects, State reimbursement control programs, or regional demonstrations, and certain types of hospitals or units specifically excluded from prospective payment (see below). It replaces the retrospective cost-based reimbursement system previously in effect and supersedes the cost per case limits and rate of increase ceilings established by TEFRA. However, payments under PPS were required to be "budget-neutral" with respect to TEFRA through FY 1985—that is, PPS payments for each of the first two years of the new system were to be no more and no less than those projected under TEFRA's provisions.

The prospective payment rate for each case applies to Medicare Part A inpatient operating costs, which include the costs of routine (room, dietary, and nursing) services, ancillary services, and services provided in special care units.

This rate is to be considered payment in full for the operating costs generated by the case, and hospitals are prohibited from billing beneficiaries for more than the statutory deductible and coinsurance amounts.

Capital costs, direct medical education costs, and kidney acquisition costs incurred by approved renal transplantation centers, as well as outpatient costs and Part B inpatient costs, continue—for the time being—to be reimbursed by Medicare on a retrospective basis.[4]

Implementation and Phase-In

Each hospital participating in the Medicare program, except for those hospitals specifically excluded from PPS, became subject to prospective payment beginning with its first cost reporting period starting on or after October 1, 1983. In order to facilitate the transition to PPS, the system was originally scheduled to be implemented over a three-year phase-in period, during which a declining portion of the total prospective payment rate for cases treated at each hospital would be based on the hospital's own historical level of costs. This hospital-specific rate would be combined with a Federal rate, which, in turn, is a combination of the appropriate regional and national rates (based, respectively, on average costs in the hospital's own geographic region and nationwide average costs).

In a series of legislative actions culminating in the Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99-272), PPS regulations in effect on September 30, 1985 were continued through April 30, 1986, and PPS phase-in period was extended by one year (except for hospitals located in Oregon).

[4]Recommendations on the issue of prospective payment for capital-related costs were contained in a report submitted to Congress by DHHS in 1986.

According to the current phase-in schedule, the hospital-specific and Federal rates are to be combined as shown in Table 2.1a. While the blend of hospital-specific and Federal rates is determined by the individual hospital's cost reporting period, the blend of regional and national rates is determined by the Federal fiscal year, as shown in Table 2.1b.

There are currently 18 different sets of regional rates, corresponding to urban and rural areas in each of the nine census regions, and two sets of national rates, one each for urban and rural hospitals. Beginning in FY 1988, the fifth year of PPS, prospective payment will be based only on the urban or rural national rates per discharge, adjusted by an area wage index and an index of cost of living for Alaska and Hawaii.

Hospitals Excluded from PPS

As stated above, hospitals participating in approved demonstration projects, State reimbursement control programs, or regional demonstrations are excluded from the nationwide payment system. At the time that PPS was implemented, this category included hospitals in Maryland, Massachusetts, New Jersey, and New York. Beginning on October 1, 1985, hospitals in Massachusetts began to participate in the nationwide payment system, as of the beginning of each hospital's first fiscal year on or after that date. Hospitals in New York similarly began prospective payment on or after January 1, 1986. However, hospitals participating in two regional demonstrations within New York State—in the Rochester area (involving nine hospitals) and in the Finger Lakes area (involving seven hospitals)—continue to be excluded from prospective payment.

Psychiatric, rehabilitation, children's, and long-term care hospitals are also

Table 2.1a

TRANSITION TO NATIONAL PAYMENT RATES UNDER PPS
HOSPITAL-SPECIFIC/FEDERAL BLEND

Cost Reporting Period Beginning On or After	Hospital-Specific Portion	Federal Portion
October 1, 1983	75%	25%
October 1, 1984	50%	50%
October 1, 1985		
First 7 months:	50%	50%
Last 5 months:	45%	55%
October 1, 1986	25%	75%
October 1, 1987	0%	100%

Table 2.1b

TRANSITION TO NATIONAL PAYMENT RATES UNDER PPS
REGIONAL/NATIONAL BLEND

Discharges On or After	Regional Portion	National Portion
October 1, 1983	100%	0%
October 1, 1984	75%	25%
October 1, 1986	50%	50%
October 1, 1987	0%	100%

excluded from PPS, as are hospitals located outside of the 50 States and the District of Columbia. In addition, distinct-part psychiatric and rehabilitation units of acute care hospitals are excluded from PPS. These hospitals and units continue--for the time being--to be reimbursed by Medicare on a retrospective basis, subject to the TEFRA limits on the rate of increase in Medicare-reimbursable costs.[5,6]

A special limited-time exclusion was also provided for alcohol/drug treatment hospitals and units, while the system was refined to allow for their appropriate payment. This exclusion was scheduled to expire on September 30, 1985, but was continued for currently excluded hospitals and units for up to two additional cost reporting periods.

Hospitals Given Special Consideration Under PPS

Hospitals that, by reason of factors such as isolated location, weather or travel conditions, or the absence of other hospitals, are the sole source of inpatient hospital services reasonably available to Medicare beneficiaries in a geographic area, may be designated as sole community hospitals. If they so choose, these hospitals may be paid indefinitely at a rate equal to 75 percent of the hospital-specific prospective payment rate plus 25 percent of the regional portion of the applicable Federal prospective payment rate. During the PPS transition period, each such hospital may also receive an additional compensating payment if, due to circumstances beyond its control, it has experienced more than a five percent decrease in inpatient cases.

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[5] Recommendations on the issue of prospective payment for hospitals currently excluded from PPS are contained in a Report to Congress being prepared by DHHS.

[6] Recommendations on the inclusion in PPS of hospitals outside of the 50 States and the District of Columbia are contained in a report submitted to Congress by DHHS in 1986.

Other hospitals receiving special consideration under PPS include Christian Science sanitoria (which are paid an amount based on their historical operating costs per discharge), hospitals that are primarily devoted to cancer treatment and research (which were given the opportunity, during their first cost reporting period under PPS, to opt for reimbursement on a reasonable cost basis, subject to the TEFRA reimbursement limits), and regional referral centers (which are paid the applicable rates for urban hospitals in the same geographic region, except that the labor-related portion of the DRG rate is adjusted by the rural wage index[7] applicable to the hospital's location).

Determination of Prospective Payment Rates for FY 1985

PPS rate for a given type of case at a given hospital during FY 1985 was determined by a procedure consisting of the following components:

- The calculation of the adjusted standardized amount, which represents the average operating cost for a typical Medicare inpatient stay, independent of the individual hospital's case mix, area wages, and indirect teaching costs;

- The calculation of the regional and national payment rates, which represent average operating costs for cases in the hospital's own geographic region and nationwide, respectively; and

[7]For a description of the role of the wage index in the determination of PPS payment rates, see the discussion in Appendix A.

- The calculation of the hospital-specific payment rate, which represents the hospital's own historical level of costs.

These components are described in more detail in Appendix A.

The PPS payment rate was then obtained by blending the hospital-specific, regional, and national payment rates in the appropriate proportions. Using the example of the hospital with a cost reporting period beginning on January 1 (see Table 2.2), a case discharged on April 15, 1985 would have been paid at a rate equal to 50 percent of the hospital-specific rate plus 37.5 percent of the appropriate regional rate plus 12.5 percent of the national rate.

Additional Payment Amounts

In addition to the basic prospective payment rate per discharge, hospitals may receive other payments under PPS. These additional payments are made in recognition of the existence of certain conditions beyond the scope of PPS, and include payments for "outlier" cases and payments to cover indirect medical education costs.

Outliers are atypical cases that either require an exceptionally long inpatient stay or exceptionally high costs when compared to the overall distribution of cases in the same DRG. To qualify as a length of stay outlier during FY 1985, the patient's stay (excluding days that are not covered under HI) was required to have exceeded the geometric mean length of stay for the DRG by the lesser of 22 days or 1.94 standard deviations. For each day in excess of the length of stay outlier threshold, the additional outlier payment amount is equal to 60 percent of the

Table 2.2

TRANSITION TO NATIONAL PAYMENT RATES UNDER PPS
FOR HOSPITAL WITH COST REPORTING PERIOD BEGINNING JANUARY 1

Time Period	Hospital-Specific Portion	Regional Portion	National Portion
Oct. 1983-Dec. 1983	--not subject to prospective payment--		
Jan. 1984-Sep. 1984	75%	25.00%	0.00%
Oct. 1984-Dec. 1984	75%	18.75%	6.25%
Jan. 1985-Jul. 1986	50%	25.00%	25.00%
Aug. 1986-Sep. 1986	45%	41.25%	13.75%
Oct. 1986-Dec. 1986	45%	27.50%	27.50%
Jan. 1987-Sep. 1987	25%	37.50%	37.50%
Oct. 1987-Dec. 1987	25%	0.00%	75.00%
Jan. 1988 onward	0%	0.00%	100.00%

average PPS standard per diem cost for the applicable DRG, which is calculated by dividing the Federal portion of PPS payment rate for the DRG by the corresponding geometric mean length of stay.

To qualify as cost outliers, cases must not meet the criteria for qualification as length of stay outliers. In addition, for FY 1985, the hospital's charges for covered services, adjusted to cost,[8] were required to have exceeded the greater of $13,000 (adjusted for each hospital's wage index) or twice the Federal rate for the DRG. The additional payment amount for cost outliers is equal to 60 percent of the difference between the hospital's adjusted cost for the case and the cost outlier threshhold. As is the case for length of stay outliers, this additional payment amount is applied only to the Federal portion of PPS payment rate.

In recognition for the tendency of teaching hospitals to treat extraordinary cases and of the extra costs involved in providing treatment within the context of graduate medical education, each hospital with an approved graduate medical education program receives an additional payment for indirect medical education costs. The amount of this additional payment is based on the hospital's proportion of full-time equivalent interns and residents per bed. For every increment of 0.1 in this ratio, the hospital received an additional payment equal to 11.59 percent (in FY 1985) of the Federal portion of the Medicare payment rate for each case, including any outlier payments.

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[8] Hospital charges were adjusted to cost for the purpose of comparison to the cost outlier criteria by multiplying total Medicare covered charges for the case by 0.72, an estimate of the average nationwide ratio of hospital costs to charges.

The PPS Incentive Structure

The system by which payments for hospital services are determined can provide powerful behavioral incentives—both positive and negative—that can affect all parties involved in the health care system. Historically, the hospital industry has been the primary target of these incentives. Since the hospital has traditionally been the central locus of the health care delivery system, and since hospital services account for a majority of health care costs, the containment of hospital costs has been the focus of many cost-cutting initiatives.

Under PPS, this historical focus on hospitals has continued. As stated by the designers of the system (U.S. Department of Health and Human Services, 1982, p.101): "When hospitals are paid in a different way, it is reasonable to expect that their behavior will change. Indeed, changing hospital behavior is the purpose of this initiative (PPS)." However, rather than directly regulating the level of hospital costs or the specific actions to be taken to reduce these costs, prospective payment is designed to alter the incentive structure with which hospitals are faced and to allow hospitals to determine their specific responses to these incentives.

While hospital behavior is the primary target of the PPS incentive structure, it is important to recognize that the new system is also likely to affect other groups—such as Medicare beneficiaries, other payers for inpatient hospital services, and other providers of health care—in significant ways. Consequently, it can be expected that the individuals and institutions in each of these groups will respond with a range of both immediate and longer-term adjustments to their behavior.

The remainder of this chapter is devoted to a brief discussion of some of the incentives that are built into PPS and some of the behavioral responses that might

reasonably be expected. The discussion of these expected responses is intended to provide a context for the findings presented in the following chapters.

Hospitals

Prior to PPS, hospitals were reimbursed for all reasonable costs incurred in the provision of inpatient care to Medicare patients. Since an increase in the cost of treatment imposed no financial penalty on the hospital, and since it realized no financial benefit from reducing the cost of treatment, the incentive was to maximize the quantity of care provided. By offering more intensive and more technologically advanced (and, therefore, usually more expensive) services, the hospital could enhance its standing in the medical care community at essentially no net cost.

Under PPS, hospitals can no longer afford to make decisions about the quantity of care without considering the cost-effectiveness of that care. The hospital stands to suffer financially if the cost of the case exceeds the fixed prospective payment amount; moreover, the hospital can realize all of the financial benefits of any reduction in the cost of the case. Thus, the various objectives of the hospital may begin to conflict with one another. On the one hand, for instance, the desire to generate net revenues--for distribution as profits to stockholders or to provide funds for capital investment--may preclude desired increases in the intensity of care or the acquisition of the latest developments in medical technology; on the other, however, the hospital may find that the competitive advantages provided by very intensive care or the availability of state-of-the-art technology outweigh their costs.

One of the changes expected under PPS is in the area of hospital administration. With the efficient provision of care becoming necessary to the financial viability of the hospital, the decisions made by the hospital administrator become increasingly important. An expansion of the size and sophistication of the administrative staff seems likely, as the importance of its role increases. In addition, PPS is expected to serve as an impetus for the development of new data bases that can be used as administrative planning tools, for controlling both the quantity of services provided and the cost of producing those services. Since the medical record has essentially become the hospital bill under PPS, the medical records staff has become more important to the hospital, and can be expected to increase in size and proficiency. With the linkage of diagnostic and financial data, it will become easier for the hospital to examine its own practice patterns, analyze its expenditures, and better determine how to provide care to its patients in a more efficient manner.

On the other hand, hospitals may be encouraged to place an increasing emphasis on pecuniary results under PPS. This may result in a growing tendency by hospital management to interfere in what were previously viewed as primarily medical decisions. This conflict between the incentive to cut costs and the desire to provide access to high-quality care for all patients was recognized at the outset of PPS. In response to this potential conflict, the PRO program described above was established to monitor the necessity, appropriateness, and quality of care provided by hospitals.

PPS is also expected to affect hospital organization and structure. For example, the recent trend toward the consolidation of hospitals into chains and other forms of multi-institutional systems (horizontal integration) seems likely to continue or accelerate, as hospitals attempt to increase their service volume and

purchasing power, and to reduce administrative overhead. In addition, hospitals are likely to diversify their services (vertical integration), by forming, acquiring, or contracting with home health agencies (HHAs), skilled nursing facilities (SNFs), free-standing outpatient clinics, etc., because the ability to provide the services offered by these types of facilities may provide a competitive edge. In the long run, then, it seems likely that the hospital industry will become both more horizontally and more vertically integrated, and that this trend will change the nature of health care delivery.

The admission and discharge practices of the hospital are also likely to be affected by PPS. Since the admission is the unit of payment, one of the most widely anticipated impacts of PPS was that hospitals might attempt to increase their revenues by increasing the volume of admissions. To counter this potential effect, Medicare admissions have been closely monitored by DHHS.[9] In addition, the PROs are responsible for reviewing the necessity and appropriateness of admissions under PPS.

Another widely anticipated impact of PPS is a decrease in the length of hospital stays. Since the hospital receives a fixed payment for each inpatient stay, each additional day of that stay represents a financial loss. This should result in fewer unnecessary hospital days for Medicare patients, and may reduce the incidence of illnesses acquired in the hospital. In order to safeguard against inappropriate discharges in response to this incentive, the PROs are empowered to recommend penalties for hospitals evidencing patterns of inappropriate care.

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[9] The expected increase in Medicare admissions has not, in fact, been observed. To the contrary, for the first time in the history of the Medicare program, admissions have declined. See Chapter 3 for a more detailed discussion of this issue.

The Medicare program has been joined by other payers for health care in attempting to shift the emphasis in health care delivery from the hospital to other more appropriate and less expensive settings. Thus, the coordination of various levels of care--ambulatory, acute, and sub-acute care--is expected to improve under PPS. An increase in transfers from hospitals to other types of health care facilities and services is expected.

There is also concern that PPS may provide an incentive to avoid certain types of patients that are viewed as unprofitable ("skimming") or to inappropriately transfer these patients once theyhave been admitted ("dumping"). In anticipation of this type of behavior, the PROs are also mandated to review the appropriateness of transfers under PPS.

PPS is also expected to affect the intensity of care. With the incentive to reduce the cost of care, the number of laboratory testing, x-rays, etc. performed in the hospital may be reduced. Depending on the way in which this reduction is accomplished, it may have positive or negative results: if there is a reduction in unneccesary ancillary services, the quality of care may improve; however, to the extent that necessary services are cut, there may be an adverse effect on the quality of care. Even if the volume of ancillary services per stay is reduced, the intensity of care may increase, due to the decreased length of each stay. Moreover, much of the observed reduction in inpatient tests and other services may be offset by an increase in pre- and post-admission services provided in the outpatient setting.

Under PPS, the mix of inputs used by hospitals and also the mix of services produced may change. Staffing levels and the mix of skills required of hospital personnel may become quite different from what they are today, as hospitals adjust to their changing role in the health care sector. Basic changes may be observed in the types of services that each hospital provides, as many hospitals find that they

can no longer afford to offer the complete range of inpatient services to their patients, and instead choose to specialize in those services that they can provide proficiently and efficiently. Greater cooperation among hospitals and between hospitals and other providers of health care--through both formal and informal referral arrangements--may be observed.

For the time being, capital costs are reimbursed on a "pass-through" basis (see the discussion earlier in this chapter). At first glance, it may appear that hospitals would have an incentive to increase their capital expenditures under this arrangement. However, capital expenditures create operating expenses that are subject to prospective payment. Thus, the incentive to increase capital expenditures may be limited under PPS. Nevertheless, the inclusion of capital costs in the PPS rate is a high DHHS priority. The Congress also has expressed the desire to include capital expenses under PPS. Once this is accomplished, PPS incentive for cost efficiency will apply directly to almost all of the costs associated with inpatient hospital care.

The purchase of technology is expected to receive increased scrutiny under prospective payment. PPS provides strong incentives for hospitals to implement technologies that are cost-reducing, while avoiding those that are cost-increasing. Thus, hospitals are likely to become more prudent buyers of new technology under PPS. This may involve strategies such as the sharing of expensive technologies among hospitals, and a general increase in the efficiency with which this equipment is purchased and utilized. Care must be taken, however, that the acquisition of new technology be evaluated on its long-run as well as its short-run cost effectiveness, so that potentially beneficial research and development is not discouraged. Under a "best case" scenario, the medical device industry would mirror the computer industry, where innovation has led to less expensive and vastly more productive equipment.

PPS may also have some overall supply effects. Although the fixed payment provided under PPS is intended to increase hospital efficiency, some hospitals may experience financial problems under the new payment system. Several features, such as the special treatment of sole community providers, the indirect teaching payment, the adjustment for area wages, and the outlier payment policy, have been added to the system to adjust for cost differences that may not conclusively be attributed to inefficiency. In addition, other improvements to the system are continually being developed and examined. In the meantime, a four-year transition period has been provided to allow for the adjustments necessary to enable efficient hospitals to continue operating once PPS is fully implemented.

Beneficiaries

The primary criterion by which the performance of any social program must be judged is its ability to efficiently provide the intended benefits to the intended beneficiary group. The Medicare program was enacted to enable the elderly (and later certain other groups) to acquire adequate medical care without economic hardship. The incentives provided by PPS must then be carefully evaluated in terms of their ultimate impact along three dimensions: the quality of care, access to care, and out-of-pocket costs.

The quality of care is a most important concern under prospective payment. To the extent that hospitals might be encouraged to reduce the provision of necessary services in order to minimize costs or to discharge patients prematurely, the quality of care might be adversely affected. However, many of the incentives that have traditionally served to maintain the quality of care in the past still remain. Physicians, who provide and direct much of the care provided to hospital patients,

have long had established codes of professional ethics, and both physicians and hospitals are subject to malpractice litigation if lower quality is reflected in negative treatment outcomes. In addition, as stated above, the PROs are required to monitor the necessity, appropriateness, and quality of care.

Furthermore, to the extent that prospective payment leads to a reduction in unnecessary care, the quality of care could be enhanced. Increased emphasis on the efficient provision of care could improve the efficacy of that care, as well. Also, a reduction in the length of hospital stays could reduce the risk of nosocomial infections and other hospital-related illness. Moreover, the incentive for hospitals to specialize in services that can be most efficiently and effectively provided may lead to improved outcomes, as discussed in Chapter 4. The quality of care under PPS will continue to be a focus of both short-run and long-run monitoring efforts by DHHS.

Medicare beneficiaries' continued access to care is also a major concern under PPS. The expected tendency of hospitals to specialize in certain services may affect access to the services that these hospitals choose not to provide. Also, since prospective payment could lead hospitals to avoid admitting patients that are seen as representing greater risk of financial loss, such as the oldest elderly or patients with ESRD, the availability of care becomes an especially important issue for those groups.

Although some of the incentives of PPS may lead to hospital behavior that can reduce access to health care, there are still many factors that serve to counteract these incentives. The special treatment of sole community hospitals and regional referral centers was intended to protect areas that might be threatened with access problems. The codes of professional ethics subscribed to by health care providers require them to provide appropriate care to all who are in need of care. The threat

of malpractice suits is an additional deterrent from selective admissions policies. DHHS will continue to monitor this issue.

Another concern relevant to the impact of PPS on Medicare beneficiaries is their out-of-pocket costs. A large portion of the medical bill for the elderly and other Medicare beneficiaries is not covered by Medicare. Since PPS incentives may affect both the volume of medical care and the setting of that care, the new system may have a substantial impact on the out-of-pocket costs borne by beneficiaries. In particular, the deductible (and also the copayment) amount for Medicare hospital stays rose rapidly in the early years of PPS, prompting action by Congress to limit this increase beginning in 1987. Also, the shift in treatment from the inpatient to the outpatient setting, where the patient is responsible for a copayment from the beginning of service, may increase the cost of care for the beneficiary. The increased utilization of sub-acute post-hospital care anticipated under PPS may also affect the financial burden on the Medicare beneficiary, if Medicare does not adequately cover the entire continuum of care.

On the other hand, a decrease in the length of hospital stays may reduce the number of beneficiaries who exhaust their Medicare hospital coverage, thus helping to avoid a substantial financial liability. Also, to the extent that the shift from inpatient to outpatient care helps beneficiaries avoid the inpatient deductible amount associated with an admission, their overall out-of-pocket costs may decrease.

Other Payers

The impact of PPS on other payers for inpatient hospital services was expected to be felt on two levels: the potential for cost-shifting and the role of PPS as an example for the cost-containment efforts of other payers.

With the implementation of PPS, it was thought that hospitals, faced with the fixed prospective payment for Medicare cases, might be encouraged to engage in cost-shifting between Medicare and other payers. Thus, other payers would be forced to pay an increased share of the total costs of the hospital to compensate for the cost-containment pressures imposed by the Medicare program. However, the increasing trend toward the implementation by other third-party payers of their own cost-containment strategies (see Chapter 5) makes it unlikely that hospitals can shift costs between payers with impunity.

PPS has served as an example for other payers in two ways. First, PPS demonstrated that the Federal Government was willing to take dramatic action to curtail the growth of health care costs. Second, the payment of hospital costs on a prospective basis, with the discharge defined as the unit of output and patients classified according to the DRGs, provided a model for other payers to use in developing their own payment systems. Over time, it is expected that many other third-party payers--especially among the State Medicaid programs--will adopt at least some features of the Federal system.

Other Providers

PPS can be expected to have a profound effect on other providers, as well. The two groups expected to be most directly affected are physicians and the providers of sub-acute post-hospital care (aftercare).

Several aspects of the behavior of physicians are likely to be affected by PPS. Hospital administrators may use various forms of persuasion to induce physicians to reduce the lengths of their patients' hospital stays, to decrease the number of tests and x-rays performed on an inpatient basis, and to otherwise contain the cost of

treatment, especially in the case of physicians whose practice patterns do not mesh with local medical standards. As the administrative pressures on physicians in the hospital increase, as the decreasing length of hospital stays reduces the income available to physicians in the hospital setting, and as the growing supply of physicians makes admitting privileges more difficult to obtain, physicians may respond by shifting many services to ambulatory settings, such as the outpatient department or their own offices.

Aftercare providers (primarily SNFs, intermediate care facilities (ICFs), and HHAs) are most likely to be affected by the tendency toward earlier discharges anticipated under PPS. This tendency is expected to result in an increase in both the number of patients seeking aftercare and the severity of illness among these patients, necessitating an increase in the capacity of these providers and the level of skills required of their staffs. Some of the pressure on the aftercare industry may be relieved by the formation of hospital-based units and services, as described above. In any case, however, the changing role of the hospital in the delivery of health care and, in particular, the emphasis on the concept of a continuum of care provided by a continuum of health care providers, is expected to cause a substantial change in this industry.

Discussion

Clearly, PPS represents an important change in the way that health care is paid for and, correspondingly, in the incentives facing the major groups of individuals and institutions in the health care sector. This chapter has briefly reviewed the developments leading up to this change, and has described the major features of the PPS. In the discussion of PPS's incentive structure and the behavioral changes that

are anticipated in response to PPS incentives, a context is provided for research on the impact of the new system. The remaining chapters in this report describe the current status of this research, some preliminary findings, and the implications of these findings.

REFERENCES FOR CHAPTER 2

Coelen, C.G. and Yaffee, R. "The National Hospital Rate-Setting Study: Summary of Current Findings on the Effects of Hospital Prospective Payment Systems." Unpublished, 1984.

U.S. Department of Health and Human Services. Hospital Prospective Payment for Medicare. Washington, D.C.: 1982.

Chapter 3

IMPACT ON HOSPITALS

Overview

The primary objective of the implementation of PPS was to change the economic incentives facing hospitals under the Medicare program. By encouraging improved efficiency in the provision of hospital care, it was hoped that it would be possible to moderate the increase in Medicare hospital costs, while, at the same time, maintaining the quality of care provided to Medicare beneficiaries and their access to the care that they need. Although it was both recognized and intended that other health care providers and other payers for acute health care would also be influenced by the new payment system, only hospital incentives were directly affected.

Because hospital behavior is the primary target of PPS, much of the effort devoted to monitoring its effects has been focused on the measurement and analysis of data on trends in hospital utilization, various aspects of patient management in the hospital and transfers between hospitals, the financial performance of hospitals in the new payment environment, and organizational changes in response to the incentives provided by prospective payment.

The 1984 annual report on the impact of PPS (U.S. Department of Health and Human Services, 1985) presented some evidence that hospitals were, in fact, responding to prospective payment in ways that were largely consistent with a priori expectations. Since FY 1985 was the first full year in which most Medicare short-stay hospitals were to be subject to the new system, data available for this second report can provide additional evidence on the impact of PPS. This chapter presents some of these additional data as they pertain to several issues discussed in the

previous report, as well as addressing some issues on which data were not available at all at the time that the 1984 report was written.

The data presented here provide a description of various aspects of hospital behavior under prospective payment, rather than a rigorous analysis of the impact of PPS itself. These data are intended to indicate whether immediate policy adjustments are called for, and to aid in the planning and design of additional studies that will focus more intensively on the impact of PPS. As discussed in Chapter 1, numerous studies of this type are being sponsored by HCFA, other Government agencies, and private organizations and, as the results from these studies become available, they will be reported in future issues of this series of annual reports.

Matrix Study Issues

The PPS Study Issues Matrix in Chapter 1 contains a listing of a number of research hypotheses on the anticipated impact of PPS on hospitals. This listing, reproduced in Table 3.1, is expressed in terms of economic considerations, as well as considerations related to the quality of care and access to care, and includes both anticipated benefits of the new system (i.e., positive effects that the system was designed to elicit) and other potential consequences.

The specification of these hypothesized impacts provides both a short-run and a long-run framework for the evaluation of PPS. In the short run, attribution of observed changes to the impact of prospective payment is problematic. However, a comparison of these observed changes to the list of a priori hypotheses contained in the PPS Study Issues Matrix can, at least, help to determine whether the performance of the health care sector is consistent with the anticipated effects of the new system. If the anticipated benefits are consistently observed under

Table 3.1

PPS STUDY ISSUES:
HYPOTHETICAL IMPACT ON HOSPITALS

Economic Impact

--Anticipated Benefits:

- Shorter inpatient stays.
- Fewer unnecessary tests and services.
- More specialization in efficiently provided services.
- Better coordination of outpatient, inpatient, and post-hospital care, through improved discharge planning.
- Reduction in excess capacity.
- Adoption of cost-reducing technology.
- Increased price competition among providers of supplies and equipment.
- Application of improved management practices.

--Other Potential Consequences:

- Increases in unnecessary admissions, readmissions, and transfers.
- Increases in hospital case mix, due to changes in coding procedures ("DRG creep").
- Separate provision of services that were traditionally considered part of routine inpatient care ("unbundling").
- Increase in cases with exceptionally lengthy stays or high costs (outliers), due to additional outlier payments.
- Underpayment of hospitals that tend to treat cases that are more severely ill or that require more intensive care.
- Reductions in hospital staffing levels.
- Diminished hospital financial performance, particularly among certain groups of hospitals.

Impact on the Quality of Care

--Anticipated Benefits:

- Reduction in the risk of nosocomial infection and other iatrogenic events, as lengths of inpatient stays decrease.
- Fewer unnecessary tests and services.
- Specialization in services most efficiently and effectively provided.
- More selective and effective use of new technology.

Table 3.1

PPS STUDY ISSUES:
HYPOTHETICAL IMPACT ON HOSPITALS
(cont.)

—Other Potential Consequences:	• Increase in unnecesssary admissions. • Reductions in necessary tests and other ancillary services. • Tendency toward premature discharges. • Reluctance to adopt quality-enhancing (but expensive in the short run) technology.
Impact on Access to Care	
—Anticipated Benefits:	• Improved coordination of outpatient, inpatient, and post-hospital care. • Shifting of services to more appropriate (and inexpensive) settings.
—Other Potential Consequences:	• Reluctance of hospitals to accept patients who present greater risk of financial loss ("skimming"). • Tendency to transfer patients who are associated with high costs or an inability to pay for their care to other hospitals ("dumping").

prospective payment, then we can be reasonably confident that policy adjustments are not immediately needed. If the anticipated benefits are not observed, however, then remedial action may be called for.

In any case, more rigorous analysis will be required to determine the role of PPS in causing the observed changes. The long-run purpose of the PPS Study Issues Matrix is to guide the development of this analysis, by indicating the questions that require the most intensive investigation.

Chapter Organization

The findings in this chapter are organized according to several headings that describe various aspects of hospital behavior that are expected to be affected by PPS:

- Hospital Utilization;
- Outliers and Transfers;
- Financial Status; and
- Other Impact Indicators.

In the section on hospital utilization, trends in admissions, length of stay, occupancy rates, and case mix are described over time and across hospital groups, where possible. The section on outliers and transfers contains a discussion of the distribution of outlier cases and the effect of the PPS provision that specifies an additional payment for these cases and a brief description of the impact of PPS on transfers between short-term hospitals and from short-term hospitals to other types

of hospitals. The financial status of hospitals under PPS is discussed on two levels: estimates that have been made of hospitals operating margins on PPS cases during FY 1984, and reports from various sources on the overall financial status of hospitals under the new payment system. Other impact indicators discussed in this chapter include changes in staffing levels and non-labor expenses reported by hospitals under prospective payment.

Hospital Utilization

Admissions

As discussed in the 1984 annual report, there was concern at the time that PPS was enacted that the new payment system, in paying on a per discharge basis, would provide an incentive for hospitals to increase the volume of Medicare admissions. For this reason, the Congress mandated a study of the impact of PPS on hospital admissions, and asked that a report be submitted on "the feasibility of making a volume adjustment in the DRG prospective payment rates or requiring preadmission certification in order to minimize the incentive to increase admissions" (Public Law 98-21, Section 603(a)(2)(C)(v)). That report is being submitted under separate cover.

Table 3.2a shows the annual number of Medicare short-stay hospital admissions for the period 1974-84.[1] Admissions rose steadily through 1982, with the rate of increase never falling much below four percent. In 1983, during which PPS began, the growth in admissions slowed somewhat, and in 1984, the first full calendar year under PPS, admissions declined for the first time, by 2.5 percent.

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[1] Unless otherwise noted, references to years denote calendar years (January through December). In referring to Federal fiscal years (October through September), the letters "FY" will preceed the year number.

Table 3.2a

MEDICARE SHORT-STAY HOSPITAL ADMISSIONS
CALENDAR YEARS 1974-84

Calendar Year	Admissions (thousands)	Percent Change	HI Enrollees (thousands)	Admissions per Thousand HI Enrollees	Percent Change
1974	7,755	---	23,524	330	---
1975	8,126	+4.78	24,398	333	+1.03
1976	8,625	+6.14	24,934	346	+3.86
1977	9,067	+5.12	25,685	353	+2.05
1978	9,423	+3.93	26,393	357	+1.14
1979	9,790	+3.89	27,072	362	+1.29
1980	10,435	+6.59	27,666	377	+4.30
1981	10,858	+4.05	28,195	385	+2.10
1982	11,337	+4.41	28,697	395	+2.59
1983	11,718	+3.36	29,177	402	+1.66
1984	11,423[a]	-2.52	29,654	385	-4.09

Table 3.2b

MEDICARE SHORT-STAY HOSPITAL ADMISSIONS
FISCAL YEARS 1982-85

Fiscal Year	Admissions (thousands)	Percent Change	HI Enrollees (thousands)	Admissions per Thousand HI Enrollees	Percent Change
1982	11,218	---	28,573	393	---
1983	11,702	+4.31	29,069	403	+2.53
1984	11,531[a]	-1.46	29,502	391	-2.91
1985	10,921[a,b]	-5.29	30,109	363	-7.20

[a]Admission counts for FY 1984 and FY 1985 do not include admissions to beds in excluded psychiatric, rehabilitation, and alcohol/drug units within short-stay hospitals, or admissions to rehabilitation and pediatric hospitals that had short-stay hospital provider numbers prior to PPS. These types of admissions are included in the admission counts for time periods prior to FY 1984 in this table.
[b]Admissions for May 1985 through September 1985 are projected based on previous seasonal trends.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy and Office of the Actuary.

The decline in the number of admissions per thousand Medicare Hospital Insurance (HI) enrollees, taking into account the growth in the beneficiary population, was 4.1 percent in 1984.

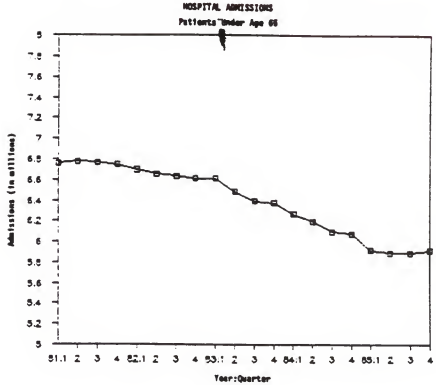
Table 3.2b shows more clearly the extent to which the decline in Medicare short-stay hospital admissions coincided with the implementation of PPS, by focusing on the Federal fiscal year. During FY 1983, admissions increased by 4.3 percent--a rate consistent with those for the calendar years 1974-82 in Table 3.2a. During FY 1984, when PPS began to take effect, admissions dropped by 1.5 percent. During FY 1985, the first full year during which "PPS-eligible" hospitals were being paid under the new system, there was a 5.3 percent decrease in admissions, with admissions per thousand beneficiaries declining by 7.2 percent. Thus, by the second year of prospective payment, Medicare beneficiaries were about 10 percent less likely to have had a hospital admission than they were before PPS. The unexpected decline in Medicare admissions not only coincided exactly with the implementation of PPS, but appeared to be accelerating as more hospitals were participating in the new system.

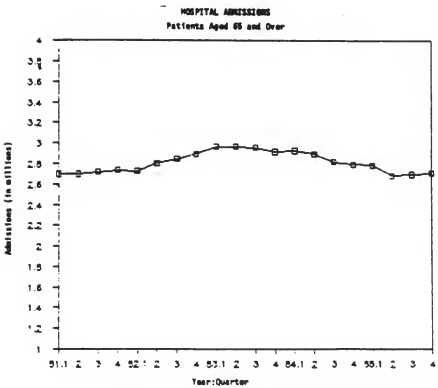
Although these data may be construed as an indication that PPS is responsible for the decline in Medicare admissions, several additional bits of evidence must be considered. As shown in Figure 3.1, the number of hospital admissions for patients under age 65--very few of whom are Medicare beneficiaries--has been declining steadily since 1981. Moreover, until the beginning of 1985, the number of admissions for patients under 65 was declining at a consistently faster rate than for patients over 65 (American Hospital Association, 1985).

Several explanations have been offered for the unexpected decline in Medicare admissions under PPS. Some of these have focused on the existence of other hospital incentives that might counteract the PPS incentive to increase admissions.

Figure 3.1

TRENDS IN HOSPITAL ADMISSIONS FOR
PATIENTS UNDER AGE 65 AND AGED 65 AND OVER





Source: American Hospital Association (1985, 1986).

However, attempts to explain changes in the number of hospital admissions solely in terms of hospital behavior may be inappropriate. The admission decision is generally made not by the hospital administrator but by the physician--who is not directly affected by the incentives built into PPS. More research on the interaction between hospital incentives and physician behavior may be useful in developing a better understanding of this issue.

Another factor in the declining volume of hospital admissions may be increased competition among various types of health care providers: more health care is being provided on an outpatient basis and in physicians' offices (see Chapter 6), and in independent centers for emergency treatment and surgery.

The Utilization and Quality Control Peer Review Organizations (PROs) that monitor the quality and appropriateness of the care provided to Medicare beneficiaries in the hospital (see Chapter 7) may contribute to the decline in Medicare admissions by discouraging inappropriate hospital care. The efforts of other third-party payers to control hospital utilization by their enrollees may also be having a major effect, as the tightening of pre-admission screening requirements and the increasing popularity of prepaid health plans (see Chapter 5) contribute to the declining use of the inpatient setting.

Length of Stay

The most commonly accepted expectation about PPS at the time of its inception was that it would result in shorter stays for Medicare patients. In fact, the hospital discharge was chosen as the unit of payment for the new system specifically because it provides the incentive to reduce the length of hospital stays, while per diem payment would have encouraged longer stays. Thus reduced length

was to be one of the major vehicles through which hospital costs were to be controlled under prospective payment.

Table 3.3 shows the annual change in the average length of stay for Medicare beneficiaries in short-stay hospitals from 1967 (the first full year of the Medicare program) to the present. These figures show that Medicare length of stay had been steadily declining over the 15-year period prior to PPS, and that the decrease during FY 1983, when the cost-containment provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) were in effect,[2] was the largest in the previous decade.

As reported in the 1984 annual report, however, length of stay dropped by 9.0 percent during the first year of prospective payment--more than twice as much as in any previous year, including the TEFRA year. By any standards, this decrease was a significant departure from the previous trend.

Since all PPS hospitals had not begun to participate in the new system until the end of FY 1984, it was expected that length of stay would again decline sharply in FY 1985. As expected, there was a sharp decline in Medicare length of stay during FY 1985, from 9.1 to 8.4 days, as shown in Figure 3.2. In percentage terms, this decrease of 7.7 percent was almost twice as great as that for any year prior to the implementation of PPS. However, as shown in Table 3.4 (column (7)), the decline in length of stay for PPS discharges only was very slight--only 1.3 percent. This indicates the effect of PPS may be leveling off, at least temporarily.

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[2]Under TEFRA, hospitals were reimbursed according to their own costs, but with a limit on the average reimbursement per Medicare case, calculated according to the average cost of hospitals in the same cost category. Hospitals with costs below the limit were paid a bonus equal to a fraction of the difference between their costs and the applicable cost limit.

Table 3.3

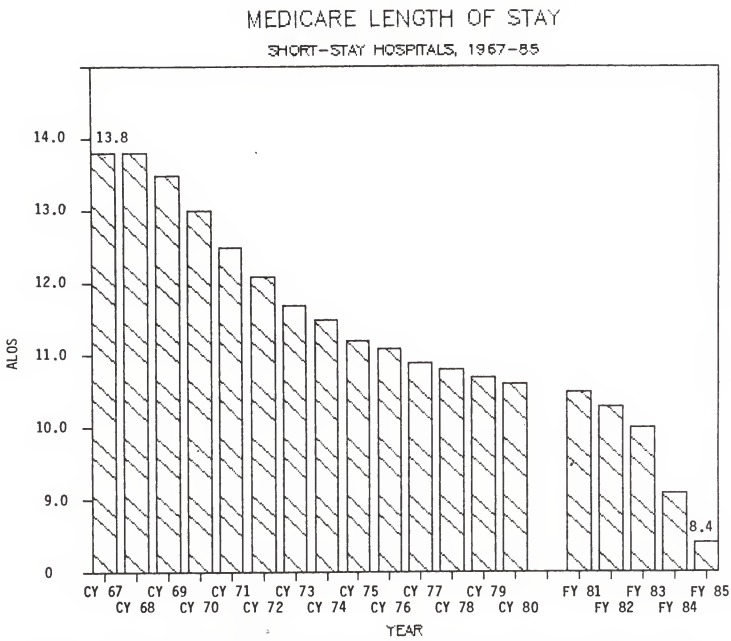
AVERAGE LENGTH OF STAY
FOR MEDICARE BENEFICIARIES IN SHORT-STAY HOSPITALS
1967-85

Year	Average Length of Stay*	Percent Change
CY 1967	13.8	---
CY 1968	13.8	0.0
CY 1969	13.5	-2.2
CY 1970	13.0	-3.8
CY 1971	12.5	-3.9
CY 1972	12.1	-3.2
CY 1973	11.7	-3.3
CY 1974	11.5	-1.7
CY 1975	11.2	-2.6
CY 1976	11.1	-0.9
CY 1977	10.9	-1.8
CY 1978	10.8	-0.9
CY 1979	10.7	-0.9
CY 1980	10.6	-0.9
CY 1981	10.5	-0.9
FY 1981	10.5	---
FY 1982	10.3	-1.9
FY 1983	10.0	-2.9
FY 1984	9.1	-9.0
FY 1985	8.4b	-7.7

*Data for CY 1967-80 include aged beneficiaries only. The omission of other beneficiaries may result in an overstatement of approximately 0.1 days in annual average length of stay for these years.
bBased on records processed at HCFA through December 1985.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

Figure 3.2



Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.4

PRE- AND POST-PPS TRENDS IN LENGTH OF STAY
FOR "PPS-ELIGIBLE" HOSPITALS
BY HOSPITAL GROUP

	Length of Stay				Percent Difference		
	Non-PPS Stays		PPS Stays		non-PPS	1984 PPS	PPS
Hospital Group	1981 (1)	1984 (2)	1984 (3)	1985 (4)	1981-84* (5)	vs. non-PPS (6)	1984-85 (7)
All hospitals	9.8	8.9	7.7	7.6	- 3.4	-13.5	- 1.3
Urban	10.3	9.4	8.1	8.0	- 3.3	-13.8	- 1.2
o <100 beds	8.2	7.5	6.6	6.5	- 3.2	-12.0	- 1.5
o 100-404 beds	10.0	9.1	7.8	7.8	- 3.4	-14.3	0.0
o 405-684 beds	11.0	9.9	8.7	8.5	- 3.8	-12.1	- 2.3
o 685+ beds	11.4	10.5	9.0	8.8	- 2.9	-14.3	- 2.2
Rural	8.6	7.7	6.8	6.7	- 3.9	-11.7	- 1.5
o <100 beds	8.0	7.2	6.3	6.1	- 3.8	-12.5	- 3.2
o 100-169 beds	8.8	8.0	7.0	6.9	- 3.4	-12.5	- 1.4
o 170+ beds	9.6	8.6	7.7	7.6	- 3.9	-10.5	- 1.3
New England	10.8	9.4	9.0	8.8	- 4.9	- 4.3	- 2.2
Mid-Atlantic	11.6	10.3	8.3	8.4	- 4.2	-19.4	+ 1.2
South Atlantic	9.8	9.2	7.9	7.9	- 2.3	-14.1	0.0
E. No. Central	11.0	9.8	8.4	8.2	- 4.1	-14.3	- 2.4
E. So. Central	9.3	8.8	7.7	7.5	- 2.0	-12.5	- 2.6
W. No. Central	9.6	8.6	7.4	7.5	- 3.9	-14.0	+ 1.4
W. So. Central	8.8	8.4	7.2	7.3	- 1.7	-14.3	+ 1.4
Mountain	8.5	7.9	6.8	6.6	- 2.6	-13.9	- 2.9
Pacific	8.5	7.8	6.7	6.9	- 3.1	-14.1	+ 3.0
Major Teaching	11.4	10.4	8.9	8.7	- 3.3	-14.4	- 2.2
Other Teaching	10.8	9.8	8.6	8.3	- 3.5	-12.2	- 3.5
Non-Teaching	9.1	8.4	7.3	7.2	- 2.9	-13.1	- 1.4
Not-for-Profit	10.1	9.2	7.9	7.8	- 3.3	-14.1	- 1.3
Proprietary	9.0	8.3	7.2	7.2	- 2.9	-13.3	0.0
Government	9.1	8.3	7.3	7.2	- 3.3	-12.0	- 1.4

*Compounded annual rate of change between calendar year 1981 and fiscal year 1984.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

Table 3.4 also shows the distribution by hospital group of changes in length of stay for Medicare discharges at "PPS-eligible" hospitals--that is, at hospitals that were to be included in the new system by the end of FY 1984. The hospital groupings used in this table (and throughout this chapter) are Medicare hospital group (urban versus rural location by bed size), geographic region, teaching status (according to the ratio of residents to beds), and ownership category.

Three sets of comparisons are presented in Table 3.4, in an attempt to indicate differences between pre- and post-PPS trends in length of stay. The pre-PPS trend is measured by the annual rate of change between all discharges in 1981 and non-PPS discharges during FY 1984 at PPS-eligible hospitals (column (5)). An indication of the immediate impact of PPS is attempted by comparing PPS and non-PPS discharges during FY 1984 at the same set of hospitals (column (6)). Finally, an indication of recent PPS trends is attempted by comparing FY 1984 PPS discharges at PPS-eligible hospitals with PPS discharges at the same set of hospitals during FY 1985 (column (7)). These measures may be useful in identifying areas in which the analysis of the impact of PPS should focus more closely.

Medicare hospital groups have historically been used in the determination of Medicare cost limits among similar types of facilities, most recently under TEFRA. Furthermore, since separate prospective payment rates are currently calculated for urban and rural hospitals, this grouping should be of interest in analyzing the impact of PPS.

Table 3.4 shows that patients at urban hospitals have longer stays than those at rural hospitals, and patients at large hospitals have longer stays than those at smaller hospitals. There is a great degree of similarity in the rate at which length of stay has declined across these groups, both before and after the implementation of PPS.

It has long been recognized that medical practice varies across geographic areas. To allow hospitals and other providers time to adjust to prospective payment based on national average costs, the Congress provided for the calculation of different payment rates according to census division during the original three-year (now four-year) PPS transition period. For this reason, it is of interest to examine the relative effects of PPS by census division.

Table 3.4 shows that, both prior to and after the implementation of PPS, the New England, East North Central, and Mid-Atlantic regions had the longest hospital stays, on average. Prior to prospective payment, those three regions had the fastest falling lengths of stay. During FY 1984, the difference between non-PPS and PPS stays was between 1.1 and 1.4 days in every region except for New England (0.4 days) and the Mid-Atlantic region (2.0 days). This was probably due to the fact that a high percentage of hospitals in New England began PPS payment late in the Federal fiscal year, while the opposite was true of Mid-Atlantic hospitals. As pointed out above, the average length of PPS stays seems to have leveled off, even increasing slightly in several regions.

Teaching status is another important determinant of hospital payment under PPS. As described in Chapter 2, in addition to the direct costs of medical education programs (which are paid by Medicare on a retrospective "pass-through" basis), teaching hospitals are paid an additional amount for indirect teaching costs, depending on the ratio of residents to beds at each hospital. Depending on the size of this additional payment, it might serve to insulate teaching hospital somewhat from the incentives for efficiency under prospective payment. In this chapter, hospitals are grouped into three categories: major teaching (residents to beds ratio greater than or equal to 0.25), other teaching (residents to beds ratio greater than zero but less than 0.25), and non-teaching.

Table 3.4 shows that average length of stay is positively correlated with teaching status. Average lengths of stay for all three teaching status groups, however, have decreased considerably since 1981, with major teaching hospitals showing a slightly steeper percentage decline than the other groups. The impact of PPS appears to be consistent across the three groups.

Hospitals were grouped by ownership category in Table 3.4 to examine whether the effectiveness of economic incentives for hospital efficiency would differ according to the strength of the profit motive. If the profit motive is important, then proprietary hospitals should exhibit the most dramatic responses to PPS. However, other factors may be involved in this response, including the fact that pre-PPS lengths of stay were shortest at proprietary hospitals—giving them less leeway to adjust to the new system.

Table 3.4 shows that average length of stay at not-for-profit hospitals has declined to a slightly greater degree than at proprietary or Government hospitals, both before and after PPS. The difference between groups, however, is very slight, and probably due to the much longer average stay at not-for-profit hospitals in the initial time period.

Summarizing the results of Table 3.4, then, one may conclude that the impact of the PPS incentive to shorten length of stay was very strong at the outset, and seems to have leveled off. This impact has been observed in every hospital group, with the possible exception of one or two geographic regions. Whether the decline in length of stay continues to decline at or above historical pre-PPS rates remains to be seen.

Occupancy Rates

Given the decline in both Medicare and non-Medicare admissions and average length of stay, as discussed above, it must follow that the number of days of inpatient care provided by the nation's hospitals also declined. In response to incentives for efficiency provided by the Medicare program and other purchasers of health care (see Chapter 5), hospitals have decreased the number of staffed beds. According to figures released by the American Hospital Association (1986), the number of staffed beds has been decreasing since the third quarter (July-September) of 1983, from slightly over one million to fewer than 975 thousand by the end of 1985. This decrease is the first prolonged downward trend in staffed beds since records have been kept on this indicator.

Although the number of staffed beds has fallen, the number of admissions has fallen faster, with occupancy rates dropping from 72.2 percent in 1983 to 66.6 percent in 1984 and 63.6 percent in 1985.

Case Mix

The Medicare Case Mix Index (CMI) is a measure of the hospital resources used in the treatment of Medicare patients. It is based on the relative weight for each diagnosis-related group (DRG), which is an indicator of the relative cost of the cases in that group. The CMI for a particular hospital or group of hospitals is calculated by taking the average of the relative weights assigned to the cases treated by that hospital or group of hospitals.

The system of relative weights is an integral part of Medicare prospective payment. By adjusting the payment for each case according to the relative

costliness of cases in that DRG, the system is more equitable across hospitals than it otherwise would have been, and potential access problems for patients with more serious illnesses is alleviated to some extent. However, because the DRG assignment is a major determinant of the payment received by the hospital under PPS, hospitals are likely to place increased emphasis on the accuracy of their coding practices, which, in turn, is likely to affect their CMIs. Thus, comparison between pre-and post-PPS CMIs is difficult. The comparability of pre-and post-PPS CMIs is further reduced by the fact that more complete diagnostic data are available on post-PPS Medicare bills, allowing for more precise DRG assignments. These factors are expected to result in systematically higher CMIs under PPS.

Table 3.5 summarizes the results of a study by the Rand Corporation (Carter and Ginsburg, 1985) of changes in the CMI between 1981--which was the base year for the initial Medicare prospective payment rates--and FY 1984--which was the first year of PPS. The Rand study found that the CMI had increased by 8.4 percent between 1981 and FY 1984, and that most of this change could be attributed to coding practice changes. Of the 6.2 percent attributed to coding practice changes, over half (3.3 percent) was found to be due to data improvements over the study time period, while the rest (2.8 percent) could be ascribed to PPS-induced changes in hospital coding, commonly referred to as "DRG creep."[3]

Another indication of the effect of PPS on the CMI may be provided by a comparison of the change for short-stay hospitals in PPS States versus short-stay hospitals in States excluded from PPS. Between 1981 and FY 1985, these changes were 12.6 percent and 3.7 percent, respectively.

[3]An analysis of data on the change in the CMI between FY 1984 and FY 1985 by the same authors (Carter and Ginsburg, 1986) found that, although coding practice changes continue to be a factor in the increase of the CMI, they were less so in the more recent time period.

Table 3.5

DECOMPOSITION OF MEDICARE CASE MIX INDEX INCREASE
CY 1981-FY 1984

Total Increase			8.4%
Medical Practice Changes			2.1
Pre-PPS Trend		1.4	
PPS-Associated Shifts to Outpatient		0.7	
Setting for Lens Procedures	0.7		
Other Outpatient Substitution	0.0		
Aging of Population			0.0
Coding Practice Changes			6.2
PPS-Induced		2.8	
Data Inconsistencies		3.3	

Source: Carter, G.M. and Ginsburg, P.B. The Medicare Case Mix Index Increase: Medical Practice Changes, Aging, and DRG Creep. Santa Monica, CA: The Rand Corporation, 1985.

Table 3.6 describes the changes in the CMI for PPS-eligible hospitals between 1981 and FY 1985, according to the hospital bills received and processed by HCFA. As this table shows, the CMI actually decreased slightly between 1981 and 1982 (column (3)), and then rose during the following year (column (4)). Just prior to their participation in PPS, hospitals seemed to have experienced a substantial increase in case mix, averaging 5.0 percent (column (5)). This may, as discussed above, be due to improved diagnostic data as well as the PPS incentive to change coding practices. During FY 1984, however, the 1.8 percent difference between PPS and non-PPS discharges at the same set of PPS-eligible hospitals (column (6)) indicates that the PPS incentive probably had a substantial effect. Also of note is the continued increase (3.9 percent) in the CMI during FY 1985 (column (7))—even after most hospitals had been under prospective payment for more than two full quarters.[4]

An examination of case mix by hospital group yields the expected results—the CMI is positively related to urban location and size, is higher on the East and West coasts and in the upper Midwest, and is much higher in teaching than in non-teaching hospitals. Examining the increase in the CMI between 1983 and FY 1985 by hospital group, large urban hospitals and hospitals in the West North Central and Pacific regions as well as teaching hospitals, appear to have had the largest increases, while rural hospitals and hospitals in the East and South had the smallest increases. Every hospital group, however, had a substantially higher CMI in FY 1985 than it did before PPS.

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[4]In fact, Table 3.6 probably understates the true increase in the CMI, since it is based on incomplete data for FY 1985. To the extent that more complex and severe cases are over-represented among those whose bills have not yet been processed, because they are associated with longer reporting and processing lags, the CMI for FY 1985 should increase as the data become more complete.

Table 3.6

PRE- AND POST-PPS TRENDS IN MEDICARE CASE MIX INDEX
FOR "PPS-ELIGIBLE" HOSPITALS
BY HOSPITAL GROUP

Hospital Group	Case Mix Index 1981 (1)	1985 (2)	Percent Difference 1981-2 (3)	1982-3 (4)	1983-4[a] (5)	1984-4[b] (6)	1984-5[c] (7)
All hospitals	1.0445	1.1767	- 0.3%	+ 1.7%	+ 5.0%	+ 1.8%	+ 3.9%
Urban	1.0711	1.2169	- 0.4	+ 2.0	+ 5.0	+ 2.5	+ 3.9
o <100 beds	0.9744	1.0744	0.0	+ 0.5	+ 4.5	+ 1.2	+ 3.7
o 100-404 beds	1.0534	1.1868	- 0.5	+ 1.8	+ 4.7	+ 2.3	+ 3.9
o 405-684 beds	1.1088	1.2765	- 0.5	+ 2.1	+ 5.8	+ 2.4	+ 4.6
o 685+ beds	1.1279	1.3213	+ 0.2	+ 3.5	+ 4.8	+ 4.9	+ 2.8
Rural	0.9758	1.0671	- 0.1	+ 0.9	+ 3.6	+ 2.0	+ 2.7
o <100 beds	0.9471	1.0282	+ 0.1	+ 0.7	+ 3.4	+ 1.8	+ 2.4
o 100-169 beds	0.9846	1.0762	+ 0.2	+ 0.5	+ 3.9	+ 1.9	+ 2.5
o 170+ beds	1.0238	1.1299	- 0.6	+ 1.3	+ 3.8	+ 2.1	+ 3.5
New England	1.0827	1.1968	- 0.9	+ 2.1	+ 4.0	+ 2.7	+ 2.3
Mid-Atlantic	1.0865	1.1671	- 1.9	+ 1.3	+ 4.1	+ 1.1	+ 2.7
South Atlantic	1.0389	1.1615	+ 0.7	+ 1.6	+ 4.7	+ 1.4	+ 2.9
E. No. Central	1.0591	1.1576	0.0	- 0.3	+ 5.2	+ 1.3	+ 2.9
E. So. Central	1.0075	1.1028	- 0.5	+ 1.1	+ 5.6	- 0.3	+ 3.4
W. No. Central	1.0207	1.1934	- 2.4	+ 5.1	+ 5.8	+ 2.6	+ 5.1
W. So. Central	0.9857	1.1597	+ 2.0	+ 2.5	+ 5.2	+ 2.2	+ 4.7
Mountain	1.0603	1.2019	- 1.0	+ 3.0	+ 5.0	+ 2.5	+ 3.3
Pacific	1.0921	1.2532	- 0.5	+ 1.7	+ 4.1	+ 4.5	+ 4.3
Major Teaching	1.1526	1.3317	- 1.0	+ 3.3	+ 5.1	+ 2.1	+ 5.2
Other Teaching	1.0949	1.2557	- 0.4	+ 2.0	+ 4.6	+ 4.5	+ 3.2
Non-Teaching	1.0114	1.1282	- 0.2	+ 1.4	+ 4.6	+ 1.6	+ 3.7
Not-for-Profit	1.0583	1.1958	- 0.4	+ 1.9	+ 5.3	+ 1.8	+ 3.9
Proprietary	1.0124	1.1292	- 0.4	+ 1.6	+ 3.9	+ 2.8	+ 3.1
Government	1.0118	1.1262	0.0	+ 1.2	+ 4.5	+ 1.1	+ 4.1

[a]Difference between 1983 CMI and CMI for 1984 non-PPS discharges.
[b]Difference between CMI for 1984 PPS and non-PPS discharges.
[c]Difference between CMI for 1984 PPS discharges and 1985 CMI.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

Outliers and Transfers

Outlier Cases and Payments

As described in Chapter 1, additional payments are made under PPS for cases that involve either exceptionally long stays (length of stay outliers) or exceptionally high costs (cost outliers). The purpose of these payments is threefold: to provide protection against the risk of large short-run losses imposed by the rare (but entirely possible) occurrence of a few exceptionally costly cases at some small hospitals; to provide partial compensation for hospitals that regularly treat exceptionally resource-intensive cases; and to eliminate the potential incentive for hospitals to avoid treating types of patients who, according to either demographic, socioeconomic, or clinical characteristics, are viewed as being more likely to require exceptionally intensive and/or extensive treatment.

In the PPS legislation (Public Law 98-21, the Social Security Amendments of 1983), the Congress required that anticipated outlier payments should account for no less than five nor more than six percent of anticipated PPS payments. Length of stay and cost criteria were thus established and published in the interim PPS rule for FY 1984 (48 FR 39752) so that, based on the data available at that time, an anticipated 5.7 percent of total PPS payments (not including indirect teaching payments) would be accounted for by outlier payments.[5] The basic PPS rates were proportionately reduced, to maintain budget neutrality.

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[5]The outlier criteria were set so that 85 percent of anticipated outlier payments would go to length of stay outlier cases, with the remaining 15 percent going to cost outlier cases. See Guterman (1986) for a more complete discussion of the development of the outlier payment policy.

In the final PPS rule for FY 1984 (49 FR 234), it was announced that, since each hospital's own outlier experience is reflected in the hospital-specific portion of the PPS payment rates, the additional outlier payment amount should apply only to the Federal portion (25 percent in FY 1984). Thus, for PPS discharges on and after February 3, 1984, the hospital-specific rates were adjusted upward (to remove the effect of the outlier adjustment) and the anticipated outlier payment percentage of 5.7 percent was reduced to approximately 1.4 percent (5.7 percent of 25 percent) of total PPS payments.

Table 3.7 compares actual and anticipated FY 1984 outlier payments. As this table shows, outlier payments would have been anticipated to account for 2.19 percent of total basic PPS payments, according to the assumptions upon which the outlier criteria were based.[6] Actual outlier payments, however, comprised only an estimated 1.17 percent of total basic PPS payments during the new system's first year. Thus, outlier payments were only about 53 percent of anticipated levels.

The reason for this discrepancy is obvious when the data are disaggregated by outlier type: while cost outlier payments were some 30 percent higher than originally anticipated, length of stay outlier payments were about 60 percent lower than anticipated. The steepness of the actual decline in average length of stay was not accounted for in the original calculation of the outlier criteria, resulting in a far smaller number of length of stay outlier cases than was anticipated. Table 3.7 also shows that outlier payments per case are close to anticipated levels, reinforcing the conclusion that the number of length of stay outliers is responsible for the

[6]This figure is a weighted average of the 5.7 percent figure anticipated under the policy in effect between October 1,1983 and February 2, 1984 and the 1.4 percent figure anticipated under the policy in affect beginning on February 3, 1984.

Table 3.7

ACTUAL VS. ANTICIPATED PPS OUTLIER PAYMENTS
FY 1984

	Actual	Anticipated
Total outlier payments:		
• as a percentage of total basic PPS payments	1.17 percent	2.19 percent
• outlier payments per outlier case	$ 1,317	$ 1,351
Length of stay outlier payments:		
• as a percentage of total basic PPS payments	0.74 percent	1.86 percent
• outlier payments per outlier case	$ 1,404	$ 1,410
Cost outlier payments:		
• as a percentage of total basic PPS payments	0.43 percent	0.33 percent
• outlier payments per outlier case	$ 1,191	$ 1,095

Source: Health Care Financing Administration, Office of Research and Demonstrations.

discrepancy between actual and anticipated outlier payments in FY 1984. The establishment of new outlier criteria for FY 1986 (which took effect on May 1, 1986, rather than as scheduled on October 1, 1985) should bring overall outlier payments more closely in line with the anticipated amounts, since these new criteria are based on post-PPS (FY 1984) data, and thus reflect the decline in length of stay that was associated with the implementation of PPS.

Table 3.8 shows the distribution of outlier cases by hospital group. Length of stay outliers comprised about 1.8 percent of all PPS cases, and cost outliers about 1.2 percent, for a total of about 3.0 percent. As the table shows, outliers were not evenly distributed among hospital groups: urban hospitals had more than twice as many outlier cases as did rural hospitals, and large hospitals had more outliers than did small hospitals; teaching hospitals were much more likely to have outlier cases than were non-teaching hospitals, and proprietary hospitals had a somewhat higher overall proportion of outliers than did the other ownership groups. In addition, hospitals in the West North Central and West South Central regions, as well as hospitals in the Mountain region, had a relatively small percentage of outlier cases.

Table 3.8 also shows that the distribution of outliers by type was also far from uniform: length of stay outliers appear to be much more strongly correlated with size and teaching status than do cost outliers. However, the percentage of cost outliers at proprietary hospitals was almost twice as high as that for either of the other ownership groups, probably due to higher charge structures at proprietary hospitals. Although the overall percentage of outliers varied relatively slightly across most regions, there were extreme differences by outlier type: for instances, while hospitals in New England and the Pacific region had about the same overall percentage of outliers (3.42 and 3.25, respectively), about 81 percent of the outliers in New England were length of stay outliers, but 59 percent of the outliers in the

Table 3.8

DISTRIBUTION OF OUTLIER CASES BY HOSPITAL GROUP
FY 1984

Hospital Group	Outliers as a Percentage of PPS Cases: Length of Stay Outliers	Cost Outliers	Total Outliers
All Hospitals	1.76%	1.21%	2.96%
Urban	2.07	1.45	3.53
• <100 beds	0.93	0.92	1.85
• 100-404 beds	1.78	1.59	3.37
• 405-684 beds	2.59	1.39	3.98
• 685+ beds	3.04	1.23	4.27
Rural	0.98	0.60	1.58
• <100 beds	0.64	0.40	1.04
• 100-169 beds	0.97	0.68	1.65
• 170+ beds	1.61	0.87	2.47
New England	2.84	0.59	3.42
Mid-Atlantic	2.05	1.38	3.44
South Atlantic	1.90	1.45	3.35
East North Central	2.10	0.84	2.94
East South Central	1.72	1.22	2.95
West North Central	1.48	0.91	2.39
West South Central	1.32	1.02	2.34
Mountain	1.16	1.40	2.56
Pacific	1.33	1.92	3.25
Major Teaching	3.39	1.15	4.54
Other Teaching	2.46	1.26	3.71
Non-Teaching •	1.34	1.19	2.53
Not-for-Profit	1.89	1.15	3.04
Proprietary	1.33	2.20	3.53
Government	1.47	0.86	2.33

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Pacific were cost outliers.[7]

As mentioned above, the PPS outlier payment policy was designed for two major purposes:

- To provide insurance against short-run financial losses to hospitals (especially small hospitals) that, due to the random occurrence of a few exceptionally high cost cases, may face financial hardship; and

- To provide compensation for hospitals that systematically treat cases that are exceptionally costly compared to other cases within the same DRG, due at least partially to variations in severity not accounted for by the current payment system.

These two aspects of the outlier payment policy have conflicting implications for the redistribution of payments across hospital groups; While the "insurance" function implies additional payments to small hospitals, the "systematic" function implies additional payments to large, urban, and teaching hospitals.

Table 3.9a shows the redistributive effect of the PPS outlier payment policy, given the actual amount of outlier payments reported by each hospital during its first cost reporting period under PPS. The comparison in this table is between the actual amount of PPS payments received by hospitals in each group and the amount that they would have received if the actual outlier payment amounts had

[7]This finding is consistent with the reasoning that led to the development of the cost outlier criterion for additional payment. It was feared that hospitals in the Pacific region, which are characterized by short, intensive treatment, would be vulnerable to financial hardship under the length of stay criterion alone.

Table 3.5a

ESTIMATED REDISTRIBUTIVE EFFECT OF PPS OUTLIER PAYMENT POLICY
HOSPITALS' 1984 COST REPORTING PERIODS

Hospital Group	PPS Payments Per Case: Actual	W/No Outlier Policy*	Percent Difference
All Hospitals	$ 3,508	$ 3,508	0.0%
Urban	3,985	3,982	+0.1
• <100 beds	2,994	3,004	-0.3
• 100-404 beds	3,785	3,787	-0.1
• 405-684 beds	4,386	4,375	+0.3
• 685+ beds	5,106	5,084	+0.4
Rural	2,221	2,228	-0.3
• <100 beds	1,986	1,997	-0.6
• 100-169 beds	2,289	2,298	-0.4
• 170+ beds	2,602	2,600	+0.1
New England	3,623	3,592	+0.9
Mid-Atlantic	3,986	3,995	-0.2
South Atlantic	3,206	3,196	+0.3
East North Central	3,832	3,831	+0.0
East South Central	2,722	2,723	-0.0
West North Central	3,176	3,184	-0.3
West South Central	3,048	3,054	-0.2
Mountain	3,506	3,515	-0.3
Pacific	4,442	4,444	-0.0
Major Teaching	5,970	5,949	+0.4
Other Teaching	4,187	4,183	+0.1
Non-Teaching	2,964	2,967	-0.1
Not-for-Profit	3,677	3,677	0.0
Proprietary	3,283	3,277	+0.2
Government	2,938	2,940	-0.1

*Assuming no change in the total amount of PPS payments.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

been used instead to supplement the basic PPS payment rates. These data are based on the Medicare hospital cost reports submitted by 4,544 PPS hospitals.

The results presented in Table 3.9a indicate that the outlier payment policy had relatively little effect on the distribution of PPS payments by hospital group during the first year of PPS.[8] The result, however, appears to have been a redistribution of payments away from small (and rural) hospitals and non-teaching hospitals and toward large (and urban) hospitals and teaching hospitals. Hospitals in New England, which have the greatest average length of stay, also appear to have benefitted from the outlier payment policy.

Table 3.9b shows the effect of the outlier payment policy on the distribution of hospital operating margins on PPS discharges during each hospital's first cost reporting period under prospective payment. If the existing policy does, in fact, serve to insure against exceptional losses, the actual percentage of hospitals with negative PPS operating margins should be less than would have been the case with no outlier policy.

The data in Table 3.9b indicate that the percentage of hospitals with negative PPS operating margins was about the same (slightly higher, in fact) under the existing payment system as it would have been with no outlier payment policy (assuming the same overall level of payment).

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[8]It should be pointed out that the outlier payment policy applies only to the Federal portion of the PPS payment, which, in FY 1984, comprised only 25 percent of the total. In each succeeding year, the Federal portion--and thus the outlier payment--will comprise an increasing part of the total PPS payment.

Table 3.9b

ESTIMATED EFFECT OF PPS OUTLIER PAYMENT POLICY
ON DISTRIBUTION OF HOSPITAL OPERATING MARGINS FOR PPS CASES
HOSPITALS' 1984 COST REPORTING PERIODS

	Percent of Hospitals with PPS Operating Margins:			
	Actual		W/No Outlier Policy*	
Hospital Group	Less Than 0	Less Than -20%	Less Than 0	Less Than -20%
All Hospitals	19.5%	3.0%	18.9%	2.9%
Urban	9.7	1.4	9.7	1.4
• <100 beds	18.5	4.2	17.3	4.2
• 100-404 beds	7.8	0.6	8.3	0.6
• 405-684 beds	2.9	0.0	3.3	0.0
• 685+ beds	0.0	0.0	0.0	0.0
Rural	28.8	4.5	27.6	4.3
• <100 beds	31.2	5.5	29.9	5.3
• 100-169 beds	21.9	1.1	21.3	0.8
• 170+ beds	18.3	1.1	17.7	1.1
New England	12.3	0.9	13.2	0.9
Mid-Atlantic	6.3	1.0	5.7	1.0
South Atlantic	16.2	2.3	16.3	2.4
East North Central	14.4	0.6	13.9	0.6
East South Central	24.7	2.3	24.3	2.5
West North Central	23.4	3.8	22.8	3.6
West South Central	25.6	6.4	24.2	5.8
Mountain	27.2	5.6	25.6	5.0
Pacific	15.3	2.3	14.9	2.3
Major Teaching	4.1	0.0	4.1	0.0
Other Teaching	5.5	0.5	5.9	0.5
Non-Teaching	22.4	3.5	21.6	3.4
Not-for-Profit	16.7	2.2	16.2	2.0
Proprietary	18.8	2.8	17.9	2.8
Government	25.9	5.0	25.3	4.8

*Assuming no change in the total amount of PPS payments.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Transfers

With the advent of PPS, Medicare payment for inpatient operating costs is limited to the prospectively determined rate for each case. As stated above, this limit is intended to encourage hospitals to reduce the duration of inpatient stays by providing no additional payment for additional patient days for a given case. However, under the current provisions of PPS, extra payments are generated in cases involving transfers between PPS hospitals[9] and between PPS hospitals and other facilities not covered by PPS.[10] Thus, it was feared that the incentive might exist to inappropriately transfer patients between PPS hospitals and other (PPS and non-PPS) facilities.

The data in Table 3.10 show trends in the frequency of discharges from short-stay hospitals in PPS States. These data were obtained from the Commission on Professional and Hospital Acitvities (1986) and are presented instead of discharge data from Medicare hospital bills for several reasons. First, the CPHA data on discharge destination extend back in time to the pre-PPS period, while Medicare data do not. Second, the CPHA data allow for comparisons between Medicare and non-Medicare patients, while the Medicare data do not. Third, the accuracy of the Medicare data have not been confirmed, since these data are not required for

[9] When a patient is transferred between hospitals subject to prospective payment, the transferring hospital receives a payment based on the average per diem rate for patients in the DRG; the discharging hospital receives the entire DRG payment.

[10] When a patient is transferred from a PPS hospital to a facility not subject to prospective payment, the transferring hospital receives a payment based on the average per diem rate for patients in the DRG; the receiving facility receives the full payment to which it is entitled under the applicable payment rules.

Table 3.10

TRANSFERS TO OTHER SHORT-STAY HOSPITALS
AND TO OTHER FACILITIES* FROM PPS HOSPITALS
1980-84

Discharge Destination	Observed Percentage 1980	1981	1982	1983	Predicted 1984	Actual 1984
Transfer to other short-term hospital:						
• Medicare	1.47%	1.70%	1.82%	1.82%	2.00%	1.76%
• Non-Medicare	1.12	1.11	1.24	1.31	1.37	1.40
Transfer to other facility:*						
• Medicare	0.87	0.93	0.91	1.02	1.04	1.46*
• Non-Medicare	0.47	0.46	0.49	0.57	0.58	0.66

*"Other facilities" include all facilities other than short-term hospitals, SNFs, and ICFs. This group is primarily comprised of long-term care, rehabilitation, and psychiatric hospitals.

*Difference from pre-PPS trend is statistically significant at 95% confidence level.

Source: Commission on Professional and Hospital Activities. The Impact of the Prospective Payment System on the Quality of Care: Report on Preliminary Findings. Report on HCFA Cooperative Agreement No. 15-C-98663/5-01, November 1985.

payment purposes. The CPHA data, however, are submitted by subscriber hospitals for the specific purpose of conducting comparisons and other analyses to enhance their management information, so there is reason to believe that they are more accurate than the Medicare bill data.

In Table 3.10, the percentage of Medicare and of non-Medicare discharges between short-term hospitals and from short-term hospitals to "other facilities"[11] is shown for 1980-83 to describe pre-PPS trends. A predicted value based on this trend is presented for 1984, and the actual value for 1984 is compared with the predicted value. The table shows that, although Medicare patients have historically been more frequently transferred between short-term hospitals than have non-Medicare patients, the 1984 transfer rate for Medicare patients actually declined (but not significantly), contrary to the increase that would have been predicted from past trends. Transfers to other facilities, however, increased substantially for Medicare patients, perhaps indicating that PPS provides a strong incentive to transfer patients to facilities not covered by prospective payment.

Financial Status

Estimated Medicare Operating Margin

As discussed above, the primary objective of PPS is to change hospital behavior. The primary instrument by which this change is to be accomplished is through the provision of economic incentives to increase the efficiency with which hospital care

[11] "Other facilities" includes all facilities other than short-term hospitals, SNFs, and ICFs. This group is primarily comprised of long-term care, rehabilitation, and psychiatric hospitals.

is provided. Thus, the financial effects of the new payment system are crucial: if hospitals feel no financial pressure, the incentives that are built into the system may be ineffective; if the prospective payment rates are too stringent, hospitals will be forced to cut necessary services or go out of business altogether. In addition to the overall financial effect, the distribution of financial outcomes is important: if the payment system is seen as being unfair, the cooperation between payers and providers—upon which, to a great extent, the success of the system depends—will deteriorate. Also, since the basis of PPS is to reward efficiency while penalizing waste, the very point of the system will be lost.

Table 3.11a shows the distribution of operating margins for PPS cases by hospital group, as reported on each hospital's Medicare cost report for its first cost reporting period under prospective payment. The average operating margin per PPS case was $495, or 16.4 percent of the average operating cost per case. Thus, indications were that hospitals fared quite well financially under the new system during the first year. This was probably due to four factors:

- Hospitals were able to keep their costs below the payment rate "targets" that were set;
- Those "targets" were set too high, due to the use of unaudited cost reports to set the Federal payment rates;
- The inflation of hospital input costs was overestimated in setting the payment rates; and
- Changes in diagnosis and procedure coding practices increased the DRG-based payments more than was expected.

The extent to which each of these factors contributed to hospital operating margins under PPS is, however, unclear.

Table 3.11a

PPS PAYMENTS, OPERATING COSTS, AND OPERATING MARGINS PER CASE
HOSPITALS' 1984 COST REPORTING PERIODS

Hospital Group	PPS Payments Per Case	Operating Cost Per Case	Operating Margin Per Case
All Hospitals	$ 3,508	$ 3,013	$ 495 (16.4%)
Urban	3,985	3,372	613 (18.2%)
• <100 beds	2,994	2,621	373 (14.2%)
• 100-404 beds	3,785	3,237	548 (16.9%)
• 405-684 beds	4,386	3,655	731 (20.0%)
• 685+ beds	5,106	4,151	955 (23.0%)
Rural	2,221	2,045	176 (8.6%)
• <100 beds	1,986	1,834	152 (8.3%)
• 100-169 beds	2,289	2,111	178 (8.4%)
• 170+ beds	2,602	2,381	221 (9.3%)
New England	3,623	3,170	453 (14.3%)
Mid-Atlantic	3,986	3,308	678 (20.5%)
South Atlantic	3,206	2,796	410 (14.7%)
East North Central	3,832	3,281	550 (16.8%)
East South Central	2,722	2,449	273 (11.1%)
West North Central	3,176	2,694	482 (17.9%)
West South Central	3,048	2,593	455 (17.5%)
Mountain	3,506	3,010	496 (16.5%)
Pacific	4,442	3,783	659 (17.4%)
Major Teaching	5,970	4,841	1,129 (23.3%)
Other Teaching	4,187	3,505	681 (19.4%)
Non-Teaching	2,964	2,614	349 (13.4%)
Not-for-Profit	3,677	3,132	545 (17.4%)
Proprietary	3,283	2,872	410 (14.3%)
Government	2,938	2,596	342 (13.2%)

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.11a also shows the distribution of operating margins per PPS case by hospital group. According to these figures, urban hospitals (18.2 percent) had considerably higher PPS operating margins than did rural hospitals (8.6 percent), although both groups appear to have realized substantial surpluses on PPS cases. Hospital size appears to be strongly correlated with PPS operating margin among urban hospitals, but not among rural hospitals.

Table 3.11a also shows wide variation in payments, operating cost, and operating margin per PPS case by region. For instance, while the average operating cost in the Pacific region ($3,783) was 54 percent higher than in the East South Central region ($2,449), the average PPS payment in the Pacific region was 63 percent higher ($4,442 versus $2,722). The Mid-Atlantic region had the highest operating margin per PPS case (20.5 percent), followed by the West North Central (17.9 percent), West South Central (17.5 percent) and Pacific (17.4 percent) regions; the East South Central region had the lowest operating margin per PPS case (11.1 percent), followed by New England (14.3 percent) and the South Atlantic (14.7 percent) region.

Teaching status was strongly correlated with operating margin. Major teaching hospitals had an average operating margin of $1,129 per PPS case (23.3 percent), while the figure for nonteaching hospitals was only $349 per PPS case (13.4 percent). Thus, while the operating cost per PPS case at major teaching hospitals was 85 percent higher than at non-teaching hospitals, the average payment that they received for PPS cases was 101 percent higher. This finding would seem to reinforce the argument for reducing the additional payment for indirect teaching

costs under PPS.[12]

The distribution of payments, operating cost, and operating margin per PPS case appeared to vary by ownership category as well. Not-for-profit hospitals had higher operating costs ($3,132 per PPS case) than proprietary or Government hospitals, but also had the highest average PPS payment ($3,677) and the highest average operating margin ($545, or 17.4 percent) of the three groups.

Table 3.11b shows the distribution of hospitals in each group by their PPS operating margins. About 20 percent of all PPS hospitals reported negative PPS operating margins during their first year under prospective payment. On the other hand, more than 27 percent reported positive PPS operating margins greater than 20 percent.

The data in Table 3.11b show a strong correlation between the distribution of PPS operating margins and both urban location and size. While 28.8 percent of all rural hospitals had PPS operating losses, only 9.7 percent of urban hospitals had operating losses on PPS cases. While 18.5 percent of hospitals in the smallest urban group had operating losses under PPS, none of the hospitals in the largest urban group did, and 60.4 percent of the hospitals in the largest urban group had PPS operating margins of greater than 20 percent.

An interesting observation is that, for rural hospitals, both the proportion of hospitals with negative PPS operating margins and the proportion of hospitals with large PPS operating margins appear to be inversely related to size; this could be a reflection of the decreased risk under prospective payment for larger hospitals, especially in rural areas.

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[12]The indirect teaching payment was, in fact, reduced under the provisions of the Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99-272).

Table 3.11b

DISTRIBUTION OF HOSPITALS
BY PERCENTAGE OPERATING MARGIN ON PPS CASES
HOSPITALS' 1984 COST REPORTING PERIODS

Hospital Group	Greater Than 20%	Greater Than 0	Less Than 0
All Hospitals	27.2%	80.6%	19.5%
Urban	37.1	90.4	9.7
• <100 beds	31.6	81.5	18.5
• 100-404 beds	36.6	92.2	7.8
• 405-684 beds	46.6	97.1	2.9
• 685+ beds	60.4	100.0	0.0
Rural	17.8	71.2	28.8
• <100 beds	18.9	68.8	31.2
• 100-169 beds	14.0	78.2	21.9
• 170+ beds	13.1	81.7	18.3
New England	17.9	87.7	12.3
Mid-Atlantic	45.8	93.8	6.3
South Atlantic	24.4	83.8	16.2
East North Central	27.1	85.6	14.4
East South Central	17.8	75.3	24.7
West North Central	25.4	76.6	23.4
West South Central	29.6	74.4	25.6
Mountain	26.9	72.8	27.2
Pacific	33.0	84.7	15.3
Major Teaching	61.5	95.9	4.1
Other Teaching	40.3	94.6	5.5
Non-Teaching	23.8	77.6	22.4
Not-for-Profit	29.4	83.3	16.7
Proprietary	29.7	81.2	18.8
Government	20.9	74.1	25.9

Source: Health Care Financing Administration, Office of Research and Demonstrations.

The data in Table 3.11b on the distribution of PPS operating margins by region, teaching status, and ownership category appear to reflect the pattern of per case averages described in Table 3.11a.

Two major conclusions may be derived from the data in Tables 3.11a and 3.11b. First, it seems that no hospital group was hurt financially by PPS during the first year. Every group realized substantial operating margins on PPS cases, so that any distributional problems were relative, rather than absolute. Second, the financial benefits that resulted from PPS seem to be concentrated among the large, urban, and teaching hospitals. To the extent that this result is due to the ability of these hospitals to cut their costs in response to PPS, it may be seen as fully consistent with the objectives of the system; however, to the extent that this concentration is due to the distribution of PPS payments, perhaps because of the excessive generosity of the payment cushions mentioned above, an adjustment in the PPS payment mechanism may be indicated.

In order to better evaluate the data on PPS operating margins, it would be useful to estimate the extent to which hospitals were able to reduce their costs under the new system. This is done in Table 3.12 by comparing the hospital-specific portion of each hospital's prospective payment rate, which represents the hospital's predicted costs during its first year under prospective payment, given its own historical cost level, to the actual costs reported by the hospital. To be sure, the hospital-specific rate is not an exact measure of the hospital's costs under pre-PPS conditions—it is greatly dependent upon the assumptions used to inflate them forward from the hospital's base year to the first year of PPS, and does not take into account any economies that might have been undertaken by the hospital between the base year and the implementation of PPS. In addition, the data presented here do not distinguish between economies resulting from an increase in efficiency and those

resulting from a decrease in services provided. Nevertheless, the examination of the data in Table 3.12 should provide a reasonable indication of the extent to which the operating margins described in Table 3.11a may have been caused by changes in hospital cost trends.

Table 3.12 contains data obtained from HCFA's PPS Impact Simulation Model, which was developed to simulate the effects of various policy alternatives on the level and distribution of PPS payments across hospitals. Being derived from estimates, rather than actual payment amounts, the data in this table may differ somewhat from the data in the previous tables.

Based on these data, it is apparent that hospitals held their costs substantially below what would have been anticipated according to the hospital-specific rates—by an estimated $495 per discharge (16.5 percent)[13]. This indicates that over 90 percent of hospital's PPS operating margins during the first year were accounted for by differences between actual and anticipated cost per case.[14] Moreover, these differences appear to have varied substantially across hospital groups.

The average difference between actual and anticipated cost at urban hospitals was larger than at rural hospitals (17.5 percent versus 11.9 percent), which appears to reflect the greater degree of discretion that urban hospitals have over their costs: the hospital-specific rate for PPS cases at urban hospitals was 73 percent higher than at rural hospitals. The largest urban hospitals appear to have realized substantial cost savings (21.3 percent), while the smallest urban hospitals appear to have had much smaller savings (11.0 percent).

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[13]This may reflect the implementation of economies in the provision of inpatient care under PPS or the overestimation of hospital-specific costs, or some combination thereof.

[14]The simulated PPS operating margin per case was $529, which differed slightly from the actual figure shown in Table 3.11a. The $495 difference between the hospital-specific rate and the simulated PPS cost per case accounts for 93.5 percent of the simulated PPS operating margin.

Table 3.12

ESTIMATED IMPACT OF THE PPS ON HOSPITAL OPERATING COSTS
HOSPITALS' 1984 COST REPORTING PERIODS

Hospital Group	Estimated Pre-PPS Cost Per Case[a]	Estimated PPS Cost Per Case[b]	Difference
All Hospitals	$ 3,506	$ 3,010	$ 495 (16.5%)
Urban	3,959	3,369	590 (17.5%)
• <100 beds	2,912	2,621	291 (11.1%)
• 100-404 beds	3,780	3,237	543 (16.8%)
• 405-684 beds	4,345	3,653	693 (19.0%)
• 685+ beds	5,022	4,139	883 (21.3%)
Rural	2,291	2,048	243 (11.9%)
• <100 beds	2,038	1,836	202 (11.0%)
• 100-169 beds	2,377	2,121	256 (12.0%)
• 170+ beds	2,692	2,381	311 (13.1%)
New England	3,580	3,175 1.05	405 (12.8%)
Mid-Atlantic	3,993	3,300 1.10	693 (21.0%)
South Atlantic	3,186	2,796 .93	390 (14.0%)
East North Central	3,813	3,280 1.09	533 (16.3%)
East South Central	2,742	2,448 .81	293 (12.0%)
West North Central	3,210	2,696 .90	514 (19.1%)
West South Central	3,105	2,599 .86	507 (19.5%)
Mountain	3,499	3,012 1.00	487 (16.2%)
Pacific	4,414	3,778 1.26	636 (16.8%)
Major Teaching	5,887	4,830	1,058 (21.9%)
Other Teaching	4,172	3,507	665 (19.0%)
Non-Teaching	2,981	2,616	366 (14.0%)
Not-for-Profit	3,680	3,130	550 (17.6%)
Proprietary	3,267	2,875	392 (13.6%)
Government	2,928	2,586	341 (13.2%)

[a]Average estimated hospital-specific payment amount for hospitals' first fiscal year under PPS, obtained from HCFA's PPS Impact Simulation Model.
[b]Average estimated operating cost per PPS case, obtained from HCFA's PPS Impact Simulation Model.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.12 also shows that three regions appear to have had relatively large differences between actual and anticipated costs under PPS: the Mid-Atlantic (21.0 percent), West South Central (19.5 percent), and West North Central (19.1 percent) regions. The East South Central region, New England, and the South Atlantic region appeared to have had the smallest cost savings (12.0, 12.8, and 14.0 percent, respectively). The East South Central and South Atlantic regions had the lowest and third-lowest hospital-specific rates in the country--and thus less discretion in cutting costs--but why New England would have had such small apparent cost savings is not obvious.

Major teaching hospitals has larger differences between actual and anticipated costs than other teaching hospitals and non-teaching hospitals (21.9, 19.0, and 14.0 percent, respectively). This finding reflects the fact that the hospital-specific rate for PPS cases at major teaching hospitals was almost 50 percent higher than at other teaching hospitals and more than twice as high as at non-teaching hospitals--that is, that teaching hospitals had more fiscal leeway within which to operate.

It might have been expected that proprietary hospitals would have both the incentive and the ability to implement drastic cost savings in response to PPS. However, among the three ownership categories, not-for-profit hospitals had the largest differences between actual and anticipated cost (17.6 percent), while proprietary (13.6 percent) and Government hospitals (13.2 percent) had smaller apparent cost savings. This again is in line with the relative hospital-specific rates for the three categories.

Impact of Regional versus National Rates

The Congressional mandate for these annual reports includes a provision to

evaluate the "impact of computing DRG prospective payment rates by census division, rather than exclusively on a national basis" (Public Law 98-21, Section 603(a)(2)(A)). In order to assess the impact of regional versus national rates, the PPS Impact Simulation Model was used to simulate the PPS revenue per case that would have been received by hospitals in each group during their first year under prospective payment if their payments had been based: (a) completely on the regional portion of the prospective payment rates and (b) completely on an estimated national rate. In each case, separate rates for urban and rural hospitals were assumed to be maintained.

The results of this simulation are presented in Table 3.13a. As this table shows, national rates would appear to favor rural hospitals over urban hospitals, relative to regional rates. This is probably due to the fact that a higher proportion of rural hospitals are located in low cost regions, which would, of course, benefit most from national rates. National rates would also appear to favor nonteaching hospitals over teaching hospitals and proprietary and Government hospitals over not-for-profit hospitals, relative to regional rates.

The largest impacts would, as might be expected, be on the individual regions: hospitals in the East North Central region and in New England would appear to be worst off under national relative to regional rates, while hospitals in the East South Central, West South Central, and Mountain regions would appear to benefit most from national rates. It is interesting to note, however, that hospitals in the West North Central region, with the third lowest cost per PPS case, would appear to be worse off under national rates, while hospitals in the Mid-Atlantic region, with the third highest cost per PPS case, would appear to benefit, according to the simulation results presented in Table 3.13a.

Table 3.13a

ESTIMATED REDISTRIBUTIVE EFFECT OF REGIONAL VS. NATIONAL PPS RATES[a]
HOSPITALS' 1984 FISCAL YEARS

Hospital Group	Estimated PPS Payments Per Case 100% REG[b]	100% NAT[c]	Percent Difference
All Hospitals	$ 3,622	$ 3,634	+ 0.3%
Urban	4,104	4,114	+ 0.1
• <100 beds	3,299	3,302	+ 0.1
• 100-404 beds	3,874	3,880	+ 0.2
• 405-684 beds	4,532	4,559	+ 0.6
• 685+ beds	5,218	5,208	- 0.2
Rural	2,330	2,347	+ 0.7
• <100 beds	2,088	2,103	+ 0.7
• 100-169 beds	2,343	2,355	+ 0.5
• 170+ beds	2,792	2,818	+ 0.9
New England	4,024	3,846	- 4.4
Mid-Atlantic	4,170	4,314	+ 3.5
South Atlantic	3,350	3,433	+ 2.5
East North Central	4,016	3,792	- 5.6
East South Central	2,745	3,048	+11.0
West North Central	3,180	3,166	- 0.4
West South Central	3,092	3,245	+ 4.9
Mountain	3,567	3,705	+ 3.9
Pacific	4,552	4,439	- 2.5
Major Teaching	6,612	6,585	- 0.4
Other Teaching	4,284	4,280	- 0.1
Non-Teaching	3,049	3,072	+ 0.8
Not-for-Profit	3,783	3,772	- 0.3
Proprietary	3,297	3,380	+ 2.5
Government	3,160	3,221	+ 1.9

[a]Separate urban and rural rates are assumed to be maintained in each case.
[b]Average estimated payment amount under 100 percent regional rates for hospitals' first fiscal year under PPS, obtained from HCFA's PPS Impact Simulation Model.
[c]Average estimated payment amount under 100 percent national rates for hospitals' first fiscal year under PPS, obtained from HCFA's PPS Impact Simulation Model.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.13b

ESTIMATED EFFECT OF REGIONAL VS. NATIONAL PPS RATES*
ON DISTRIBUTION OF HOSPITAL OPERATING MARGINS FOR PPS CASES
HOSPITALS' 1984 FISCAL YEARS

	Percent of Hospitals with Estimated Operating Margins:					
	100% REG			100% NAT		
Hospital Group	Less Than 0	Greater Than 0	Greater Than 20%	Less Than 0	Greater Than 0	Greater Than 20%
All Hospitals	17.7%	82.3%	45.7%	17.7%	82.3%	47.4%
Urban	12.0	88.0	52.7	12.4	87.6	54.1
• <100 beds	13.4	86.6	59.6	12.5	87.5	60.6
• 100-404 beds	12.3	87.7	48.4	13.6	86.4	49.5
• 405-684 beds	9.4	90.6	58.5	8.7	91.3	61.7
• 685+ beds	4.2	95.8	62.5	2.1	97.9	64.6
Rural	23.1	76.9	38.9	22.8	77.2	41.0
• <100 beds	22.2	77.8	41.2	22.0	78.0	43.0
• 100-169 beds	30.5	69.5	26.9	28.9	71.1	30.0
• 170+ beds	17.7	82.3	40.0	18.3	81.7	43.4
New England	8.5	91.5	63.2	10.4	89.6	49.1
Mid-Atlantic	4.7	95.3	64.6	5.7	94.3	67.7
South Atlantic	17.5	82.5	43.5	13.9	86.1	49.6
E. No. Central	13.3	86.7	49.9	23.2	76.8	36.3
E. So. Central	19.6	80.4	41.6	11.7	88.3	58.2
W. No. Central	21.3	78.7	41.5	19.5	80.5	44.0
W. So. Central	22.8	77.2	42.1	17.7	82.3	53.7
Mountain	21.2	78.7	39.7	20.6	79.4	45.3
Pacific	16.2	83.8	48.7	20.7	79.3	42.5
Major Teaching	1.6	98.4	82.8	2.5	97.5	82.8
Other Teaching	10.9	89.1	51.8	11.7	88.3	51.7
Non-Teaching	19.4	80.6	43.4	19.3	80.7	45.5
Not-for-Profit	16.2	83.8	47.3	17.3	82.7	46.4
Proprietary	22.2	77.8	35.9	19.6	80.4	43.8
Government	18.7	81.3	47.5	17.5	82.5	51.7

*Separate urban and rural rates are assumed to be maintained in each case.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.13b describes the distribution of hospitals by percent PPS operating margin under simulated regional versus national PPS rates. The overall difference between the two scenarios seems small, in terms of the proportion of hospitals with negative PPS operating margins. However, the proportion of hospitals with very large PPS operating margins seems to be slightly higher under national rates, indicating a higher concentration of financial benefits.

The choice between regional and national rates does not seem to significantly affect the proportion of urban or rural hospitals with negative PPS operating margins. The results by hospital size and teaching status are mixed. However, there does seem to be a lower proportion of proprietary hospitals with negative PPS operating margins under national rates. National rates also seem to help those regions with high proportions of hospitals with negative PPS operating margins under regional rates and hurt those regions with low proportions of hospitals with negative PPS operating margins under regional rates.

A comparison of the data in Table 3.13b with data from a simulation based on the actual PPS payment formula during the first year (75 percent of the hospital-specific rate and 25 percent of the Federal rate), however, indicates that, regardless of the effect of regional versus national rates, either of these extremes would have resulted in a considerably more polarized distribution of hospital operating margins than that which actually occurred during the first year of the transition period. Both the number of hospitals with negative operating margins and the number of hospitals with very large (greater than 20 percent) operating margins were substantially larger in the 100 percent regional and 100 percent national payment rate simulations than in the simulation based on the actual blend of hospital-specific and Federal rates. Thus, it appears that the hospital-specific component of the PPS payment rate may have provided some stability to the system.

Overall Hospital Financial Status

In the previous section, estimated hospital operating margins on PPS discharges were examined in order to provide information as to the direct financial effect of the new payment system. However, although Medicare payments constitute a major portion of hospital revenues, hospitals' overall financial performance is also important. Given the many cost containment initiatives being undertaken by other public and private third-party payers for health care services, there may be any number of new factors influencing hospital financial status. In order both to more accurately interpret the effect of PPS and to determine the continued viability of hospitals in the new payment environment, some information on the overall performance of hospitals is presented here.

Table 3.14a contains data from the AHA's monthly National Hospital Panel Survey on annual percentage changes in revenue and cost per adjusted admission (a weighted average of inpatient admissions and outpatient visits, intended to measure the hospital's total workload). These data show that, while cost per adjusted admission rose faster than revenue per adjusted admission in five of the seven years between 1967 (the beginning of the Medicare program) and 1973, revenues rose faster in 10 of the 11 succeeding years (1974-84). In Table 3.14b, monthly figures are presented for FY 1985 (October 1984-September 1985); these monthly figures generally indicate a continuation of the previous yearly trend.

Table 3.15a describes the trend in overall annual operating margins from the National Hospital Panel Survey, expressed in terms of two indicators: patient revenue operating margin and total revenue operating margin. Patient revenue operating margin is equal to the percentage of net patient revenue retained after total expenses are subtracted; total revenue operating margin is the percentage of

Table 3.14a

TRENDS IN REVENUE AND COST PER ADJUSTED ADMISSION*
1967-84

Calendar Year	Percentage Change from Previous Year	
	Revenue per Adjusted Admission	Cost Per Adjusted Admission
1967	17.74%	19.13%
1968	14.18	13.40
1969	13.53	14.53
1970	10.00	10.32
1971	10.29	10.10
1972	8.29	8.82
1973	6.87	7.52
1974	12.40	11.39
1975	16.73	16.48
1976	15.81	14.83
1977	12.89	12.33
1978	11.71	11.77
1979	10.76	10.35
1980	14.24	13.49
1981	17.54	17.38
1982	16.03	15.52
1983	10.20	10.16
1984	8.68	7.48

Table 3.14b

TRENDS IN REVENUE AND COST PER ADJUSTED ADMISSION*
BY MONTH, FY 1985

Month	Percentage Change from Same Month in Previous Year	
	Revenue per Adjusted Admission	Cost Per Adjusted Admission
Oct. 1984	9.4%	6.4%
Nov. 1984	11.0	8.6
Dec. 1984	8.1	6.3
Jan. 1985	9.8	8.1
Feb. 1985	11.4	9.8
Mar. 1985	9.2	9.4
Apr. 1985	9.6	9.7
May 1985	10.5	10.4
Jun. 1985	8.4	9.2
Jul. 1985	10.3	9.7
Aug. 1985	9.5	9.7
Sep. 1985	5.7	6.8

*"Adjusted admissions" are a weighted average of inpatient admissions and outpatient visits, representing the hospital's overall workload.

Source: American Hospital Association, National Hospital Panel Survey.

Table 3.15a

TRENDS IN OVERALL HOSPITAL OPERATING MARGINS
1967-84

Calendar Year	Patient Revenue Operating Margin	Total Revenue Operating Margin
1967	-4.6%	2.6%
1968	-3.0	3.2
1969	-3.9	2.4
1970	-3.4	2.1
1971	-3.2	2.3
1972	-3.7	1.8
1973	-4.4	1.2
1974	-3.7	2.1
1975	-3.0	2.3
1976	-1.5	3.1
1977	-0.6	3.6
1978	-0.8	3.6
1979	-0.6	3.9
1980	0.3	4.6
1981	0.2	4.7
1982	0.7	5.1
1983	1.0	5.1
1984	2.0	6.2

Table 3.15b

TRENDS IN OVERALL HOSPITAL OPERATING MARGINS
BY MONTH, FY 1985

Month	Patient Revenue Operating Margin	Total Revenue Operating Margin
Oct. 1984	3.8%	7.9%
Nov. 1984	1.7	6.0
Dec. 1984	- 2.1	2.9
Jan. 1985	4.4	8.4
Feb. 1985	3.8	8.0
Mar. 1985	2.9	7.2
Apr. 1985	2.1	6.5
May 1985	1.8	6.2
Jun. 1985	- 0.1	4.6
Jul. 1985	1.8	6.1
Aug. 1985	2.1	6.4
Sep. 1985	0.4	5.1

Source: American Hospital Association, National Hospital Panel Survey.

net total revenue retained after total expenses are subtracted. Since total expenses are subtracted in each case, patient revenue operating margin is, by definition, the more negative or less positive of the two indicators; total revenue operating margin is the more accurate indicator of hospital financial status, however, because it balances revenues from all sources against the analagous costs.

The data in Table 3.15a show that, while annual patient revenue operating margins were consistently negative through 1979, they have been increasing fairly steadily and have been positive since 1980. Total revenue operating margin, on the other hand, has consistently been positive and has grown or remained the same in every year since 1973. Table 3.15b shows monthly patient and total revenue operating margins during FY 1985 and, in both cases, seems to indicate a continuation of the previous yearly trends.

In a study of hospital finances for the period 1980-84 (Cleverley, 1985), the Healthcare Financial Management Association (HFMA) examined data from audited financial Statements for a self-selected sample of between 1,144 and 1,512 hospitals that subscribed to their Financial Analysis Service (FAS) during the study period. Table 3.16 shows that profitability, as measured by the operating margin ratio, increased during the first year of PPS, from a median level of 2.1 percent in 1983 to 2.6 percent in 1984--the first increase in two successive years reported since the FAS began in 1979. The HFMA study attributed this increase in profitability to effective expenditure control, noting that "other operating expenses" fell from 79.8 percent of gross patient revenue in 1980 to 72.8 percent in 1984.

Table 3.16 also shows the level and growth of profitability among different types of hospitals in the HFMA sample. Hospitals were grouped into five geographic areas: Northeastern (the New England and Middle Atlantic census regions), East North Central, Southern (the South Atlantic and East South Central census regions),

Table 3.16

MEDIAN OVERALL HOSPITAL OPERATING MARGINS BY HOSPITAL GROUP
1980-84

Hospital Group	Year 1980	1981	1982	1983	1984
All Hospitals	1.9%	2.0%	1.9%	2.1%	2.6%
Under 100 Beds	0.7	0.8	0.4	0.6	0.9
100-199 Beds	2.1	1.9	1.9	2.0	2.2
200-299 Beds	2.1	2.0	1.9	2.5	2.9
300-399 Beds	2.3	2.5	2.5	2.8	3.2
400 or More Beds	2.1	2.4	2.2	2.7	3.2
Northeast	0.4	0.4	0.2	0.5	0.6
East North Central	2.1	2.1	1.9	2.1	2.8
South	2.2	1.8	2.5	2.6	3.3
Near West	3.1	2.8	2.5	3.3	3.0
Far West	3.0	3.4	3.1	3.2	3.6
Urban	2.0	2.1	2.1	2.4	2.8
Rural	1.7	1.4	1.4	1.4	1.9

Source: Cleverley, W.O. Hospital Industry Analysis Report, 1980-1984. Oak Brook, IL: Healthcare Financial Management Association, 1985.

Near Western (the West North Central and West South Central census regions), and Far Western (the Mountain and Pacific census regions). Most striking is the relatively low median operating margin of 0.6 percent among hospitals in the Northeastern area, which contained 248 hospitals, or 22 percent of the 1984 sample. The other areas had median operating margins ranging from 2.8 percent (East North Central) to 3.6 percent (Far Western).

Hospitals were grouped by size into five categories: under 100 beds, 100-199 beds, 200-299 beds, 300-399 beds, and 400 or more beds. As shown in Table 3.16, each of these categories had higher median operating margins in 1984 than they had in 1983. Across categories, median operating margin was found to be correlated with size in 1984, except for the largest hospitals. Cross-tabulating bed size by area, only one group had a negative median operating margin: Northeastern hospitals with fewer than 100 beds, which included 35 hospitals in the 1984 sample.

Table 3.16 also shows that urban hospitals had substantially higher margins than did rural hospitals in each year of the study period, but this difference appeared to narrow during 1984 and was found to be largely explained by differences in hospital size.

The conclusion to be derived from the data presented above is that the overall financial status of hospitals improved during the first year of PPS, continuing a trend that had been observed for several years preceding the new payment system. Although some groups of hospitals seemed in a stronger financial position than others, the improvement observed during 1984 was fairly widespread, indicating that PPS and other concurrent cost-containment initiatives, in general, did not impose financial hardship on hospitals in 1984.

The financial performance of hospitals in the new payment environment will continue to be monitored. The finding thus far, however, is that hospitals have been

able to respond to the new payment environment, and that--at least to this point--they are being rewarded quite handsomely for their efforts.

Other Impact Indicators

Staffing Levels

Decreasing admissions and shorter stays have led to a sharp decline in the utilization of inpatient hospital services in 1984 and 1985, as reported above. In response to this decline in utilization, the number of hospital beds in use has declined over the past two years (AHA, 1986). Given these trends, it is not surprising that staffing levels at hospitals have also been cut. As reported by the AHA, full-time equivalent employment at the nation's hospitals decreased by 2.3 percent during 1984, to 3.07 million from a peak of 3.19 million before the implementation of PPS. This decrease was concentrated among full-time personnel, the number of which dropped by 2.6 percent, while the number of part-time personnel dropped by only 0.8 percent. These declines in staffing levels, however, were slower than the decline in utilization, as the number of full-time equivalent personnel per adjusted admission rose slightly (by 0.5 percent) in 1984.

Data for 1985 indicate that the trend toward staffing cuts appeared to continue for the first three quarters, but that staffing levels increased slightly during the fourth quarter, in response to a slight upturn in admissions. For the year, the number of full-time equivalent personnel fell by 2.3 percent (the same rate as in 1984), to 3.05 million. This decrease was composed of a 2.7 percent decrease in full-time personnel and a 0.1 percent decrease in part-time personnel. Full-time

equivalent personnel per adjusted admission continued to rise slightly, at a rate of 0.2 percent, during 1985.

Non-Labor Expenses

According to the AHA, non-labor expenses at the nation's hospitals grew by only 5.9 percent during 1984, compared to 11.3 percent in the previous year. This increase included a 16.8 percent increase in depreciation expenses (compared to 16.9 percent in 1983), a 21.9 percent increase in interest expenses (compared to 17.6 percent in 1983), and a 3.5 percent increase in supplies, services, and other expenses (compared to 10.2 percent in 1983). The indication is, then, that supplies, services, and other expenses, rather than capital costs, accounted for the slower growth in non-labor expenses.

During 1985, the growth in depreciation and interest expenses appeared to have slowed slightly: depreciation grew by 12.4 percent during 1985, while interest grew by 11.3 percent. Supplies, services, and other expenses continued to grow at a slower rate than either depreciation or interest, but that growth was at a somewhat higher rate than in the previous year (8.1 percent versus 3.5 percent).

The Strength of PPS Incentives

Although it is difficult to determine the degree to which PPS has been responsible for the changes in hospital behavior that have been observed since its implementation, Feder, Hadley, and Zuckerman (1986) provide some evidence that the strength of PPS incentives does, in fact, determine the degree of hospital response. The strength of PPS incentives was measured by the potential percentage

loss in revenue faced by the hospital under prospective payment relative to its projected revenue under cost-based reimbursement. This was calculated by computing the hospital's PPS payment per admission in 1984, projecting what its cost (and, by assumption, payment) per admission would have been under cost-based reimbursement from pre-PPS (and pre-TEFRA) trends, multiplying the difference by the number of projected 1984 Medicare admissions, and dividing by projected 1984 total hospital revenue. The resulting index does not describe what did occur to hospitals under PPS, but rather the situations that they faced if they did not change their pre-PPS behavior.

Feder, Hadley, and Zuckerman grouped hospitals according to the value of this PPS Impact Index, into three categories: hospitals that faced the most adverse impacts (the lowest quartile by index value); hospitals that faced the least adverse impacts (the highest quartile by index value); and hospitals that were in the intermediate group. Since they were dealing with hospitals' cost reporting periods ending in calendar 1984, they also had data on a number of hospitals that were still under TEFRA's payment provisions. They could thus compare hospital responses along two dimensions: TEFRA versus PPS and PPS low, intermediate, and high impact.

Table 3.17 shows the increase in Medicare revenue and cost per case by TEFRA and PPS group. These data indicate that, while the PPS hospitals had slightly greater increases in revenue per case (18.1 percent versus 17.7 percent), their increase in cost per case was barely two-fifths of what the TEFRA hospitals experienced (7.6 percent versus 18.1 percent). Furthermore, the hospitals facing the most severe financial pressure under PPS had less than one-third of the increase in cost per case (and only about two-fifths of the increase in revenue per case) experienced by the hospitals facing the least severe financial pressure.

Table 3.17
INCREASES IN MEDICARE REVENUE AND COST PER CASE
BY PAYMENT GROUP
1982-84

Payment Group	Increase in Medicare Revenue per Case	Increase in Medicare Cost per Case
TEFRA	+17.7%	+18.1%
PPS	+18.5	+7.6
-Most Severe Potential Impact	+9.6	+3.2
-Intermediate Potential Impact	+20.1	+8.9
-Least Severe Potential Impact	+25.5	+10.2

Source: Feder, Hadley, and Zuckerman (1986).

Table 3.18 shows the changes in admissions and length of stay between 1982 and 1984 for TEFRA and PPS hospitals. These data also indicate the effect of variation in the strength of PPS incentives. While TEFRA hospitals reduced their average length of stay by 7.9 percent, PPS hospitals reduced theirs by 14.6 percent. The PPS hospitals facing the most severe financial presurre had a 17.5 percent decrease in average length of stay, compared with an 11.1 percent decrease for the hospitals facing the least severe financial pressure. Table 3.18 also shows that, while TEFRA hospitals had a 3.4 percent increase in admissions, PPS hospitals had an 0.4 percent decrease. This difference is not consistent with a priori expectations about PPS incentives, but the influence of the PROs and their increased importance under PPS may be reflected in these data.

Discussion

The purpose of this chapter is to present data on the impact of PPS on hospitals in order to evaluate the success of the new payment system in achieving its primary purpose: the encouragement of changes in hospital behavior that would result in increased efficiency in the provision of health care. The evaluation of whether or the extent to which hospitals have become more efficient is an extremely broad question, which cannot be answered fully in this report. However, we have attempted to present evidence that might be useful in forming preliminary conclusions about the impact of PPS on how hospitals operate and that, in addition, may indicate the areas on which future research efforts should focus.

Table 3.18
CHANGES IN MEDICARE ADMISSIONS AND LENGTH OF STAY
BY PAYMENT GROUP
1982-84

Payment Group	Change in Admission	Change in Length of Stay
TEFRA	+3.4%	-7.9%
PPS	-0.4	-14.6
-Most Severe Potential Impact	-0.3	-17.5
-Intermediate Potential Impact	-0.9	-14.8
-Least Severe Potential Impact	-0.1	-11.1

Source: Feder, Hadley, and Zuckerman (1986).

The findings presented in this chapter indicate that the interpretation of PPS effects on hospital behavior is a complex issue. Average length of stay for all Medicare patients continues to decline, but there are indications that length of stay for PPS discharges has, at least temporarily, leveled off. The decline in Medicare admissions was unexpected, given the incentives built into the new system, and that decline has accelerated during FY 1985; however, given the longer and steeper decline in hospital admissions for non-Medicare patients, factors outside of the Medicare program may be partially responsible for this effect. There is strong evidence from several sources that hospitals did very well financially under PPS during the first year.

Overall, then, the picture that is formed is one of a system that is having a substantial impact, both directly and indirectly, on the way that hospitals behave and on the outcomes of that behavior. It will be interesting and important to focus on several of the issues addressed in this chapter as time provides more answers to the questions represented by the study hypotheses listed in Table 3.1. The examination and careful analysis of these issues will be the major objective of the upcoming reports in this series.

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Chapter 4

IMPACT ON MEDICARE BENEFICIARIES

Overview

The primary objective of PPS is to encourage cost-efficient behavior by hospitals under Medicare. The new payment system should also serve to insure that Medicare beneficiaries continue to have adequate access to high quality health care. Thus, an important aspect of the impact of PPS involves its effect on the ability of the Medicare system to maintain or improve upon pre-PPS levels of access to and quality of care for its beneficiaries. The purpose of this chapter is to lay the groundwork as to how these issues may be addressed and to provide currently available information on the impact of the first year's experience of PPS on Medicare beneficiaries' access to care and quality of care.

This chapter is organized as follows. First, is a discussion of how the chapter fits into the overall study matrix. Next is a general discussion of considerations in assessing access to and quality of care. Then, brief summaries of the various studies underway are presented. The remainder of the chapter presents the methods and findings of the seven studies from which results are available.

Study Matrix

PPS impacts on access and quality are represented in the overall PPS Study Issues Matrix in Chapter 1, reproduced in Table 4-1. This matrix highlights some of the key issues associated with the evaluation of the impact of PPS on Medicare beneficiaries.

Table 4.1

PPS STUDY ISSUES:
HYPOTHETICAL IMPACT ON MEDICARE BENEFICIARIES

Economic Impact	
—Anticipated Benefits:	• Part A liability limited to legal deductible and coinsurance amounts.
—Other Potential Consequences:	• Higher deductible and coinsurance amounts, if length of stay decreases more rapidly than cost per case. • Higher out-of-pocket cost for non-hospital services, as care is shifted to outpatient and office settings and utilization of post-hospital care increases.
Impact on the Quality of Care	
—Anticipated Benefits:	• Reduction in the risk of nosocomial infection and other iatrogenic events, as lengths of inpatient stays decrease. • Fewer unnecessary tests and services. • Specialization in services most efficiently and effectively provided. • More selective and effective use of new technology.
—Other Potential Consequences:	• Reductions in necessary tests and other ancillary services. • Decrease in necessary inpatient physician consultations. • Tendency toward premature discharges.
Impact on Access to Care	
—Anticipated Benefits:	• Improved coordination of outpatient, inpatient, and post-hospital care. • Shifting of services to more appropriate (and inexpensive) settings.
—Other Potential Consequences:	• Reluctance of hospitals to accept patients who present greater risk of financial loss ("skimming"). • Tendency to transfer patients who are associated with high costs or an inability to pay for their care to other hospitals ("dumping"). • Lack of appropriate post-hospital care, as more severely ill patients are discharged earlier ("sicker and quicker") from inpatient care.

Considerations in Assessing Access and Quality of Care

Judging appropriate levels of medical care access is complex since there are no accepted standards against which to evaluate access levels. From an international perspective, wide variations exist among nations in terms of Gross National Product (GNP) investment in the provision of health care. The following listing illustrates this variation for a sampling of developed nations:

Country	Health Outlays Percent GNP (1980)
- United States	9.5
- Canada	7.4
- West Germany	9.6
- United Kingdom	5.8

These data suggest that there is no clearly established norm for optimal levels or intensity of services to be delivered to a population. In addition, it is well known that large variations in health care delivery patterns exist within the U.S. among small and large areas as measured, for example, by hospital lengths of stay and hospital days per thousand population. Optimal levels of health care services would represent a level and mix of services and expenditures needed to maximize

the health status of the population at the lowest cost. From a conceptual standpoint, it is apparent that sub-optimal health outcomes could result from:

- Inaccessibility or underprovision of required services; or
- Overprovision of services subjecting patients to unnecessary risks of care (e.g., unnecessary surgery) or iatrogenic effects.

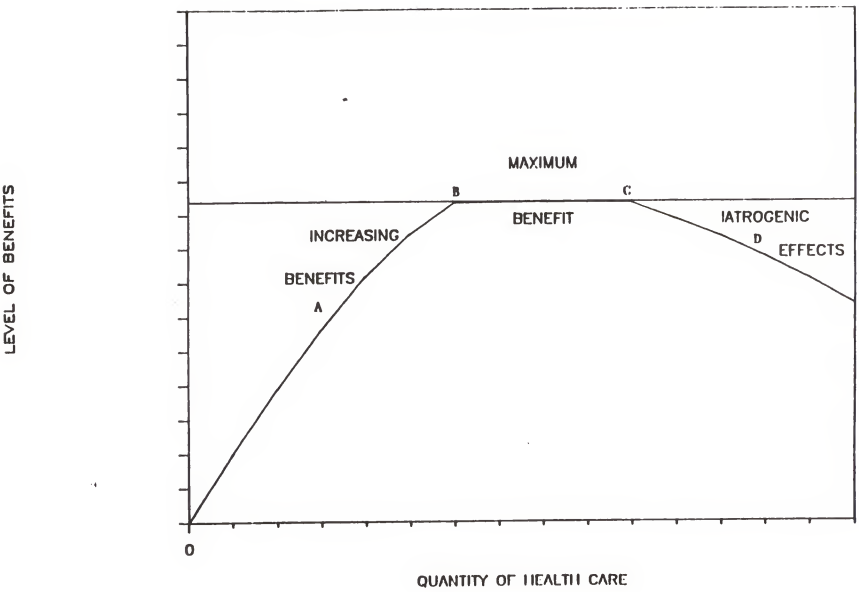
From this perspective, the goal of national health care policy would be to identify the optimal range of service delivery levels which assure necessary care while avoiding the unnecessary risks of overprovision. Figure 4.1 is a conceptual model which illustrates, in broad general terms, the relationship between level of benefits and the quantity of health care delivered. Maximum benefits are represented by the top portion of the curve (B - C), with decreasing benefits shown by left and right-hand sides of the curve, resulting from under and overutilization, respectively.

From a cost containment policy perspective, the optimal point on the curve is at point B. Additional expenditures move toward point C with no additional benefit. If a society is placed toward point C on the continuum, a prudent cost containment policy is to move left on the continuum without passing point B. An important objective of quality assurance and quality measurement techniques is to determine if a society is at point B or moving towards point A.

Assessing health care quality has been traditionally categorized as measuring factors related to:

Figure 4.1

TOTAL PRODUCT CURVE



- Structure
- Process
- Outcome

Structure refers to the setting in which services are rendered (e.g., facilities, personnel, and equipment) process refers to the services actually rendered, and outcome concerns the effects of health care in terms of health status. Each of these approaches to the measurement of quality is associated with a series of advantages and disadvantages. Attributive (cause and effect) inferences concerning quality are difficult using any one of these approaches. The structure and process approaches are dependent upon the establishment of standards developed largely on the basis of prevailing opinion, subject to uncertainty and changes over time (e.g., as in the case of recommended lengths of stay for acute myocardial infarctions). Use of outcome measures can be problematic because these data may be distorted by a number of factors other than health care.

These methodological considerations suggest that the optimal approach to assessing quality of care is to understand the causal relationships among each of these categories of measures. Although a number of studies are underway which will help define these linkages, an indepth understanding of the inter-relationships among structure, process, and outcome is not currently available for a definitive assessment of the impact of PPS on the quality of care. Therefore, the approach of this chapter is to examine a number of available measures and to formulate quality of care inferences to the extent that the data warrant.

Studies Underway

This section describes five studies currently being funded or conducted by HCFA dealing with the impact of PPS on Medicare beneficiaries from which results are not yet available.

Nonintrusive Outcome Study

The Rand Corporation has a major study underway to investigate the feasibility of using Medicare administrative data to measure quality of care levels within individual hospitals. The methods produced from this study are expected to have significant potential for improving the ongoing monitoring capability in identifying provider-specific quality problems as a basis for PRO follow-up. Outcome measures to be used in this study include: hospitalization related deaths, total deaths, and hospital readmissions for approximately five medical conditions. Results from this study will be included in future reports to Congress. A final report is scheduled for September 1987.

Clinical Analysis of the Quality of Care

A second major study by Rand is to assess the impact of PPS on inpatient hospital treatment patterns by a thorough examination of the medical record and subsequent health status outcomes. This analysis will measure quality levels through a complex clinical scoring technique based on protocols developed by expert medical consensus panels.

Patient care data will be abstracted directly from the medical record by specially trained health care personnel employed by PROs. These data will be linked with MSS data to help confirm the results of the quality scores; outcome data include hospital readmissions, SNF admissions, etc. Results from this study will be included in future reports to Congress. A final report is scheduled for September 1988.

ESRD Study

The Urban Institute is performing this evaluation of PPS quality impacts on the ESRD population, a sub-group of the overall Medicare population hypothesized to comprise an unusually high risk medical group. Since ESRD patients represent a potentially high cost inpatient category, hospitals could have an adverse incentive not to admit or provide adequate care for such patients under the fixed price DRG reimbursement approach. The study design for this project is based upon a pre-/post-PPS approach using 1980 and 1981 as the pre-PPS baseline period and 1984 as the PPS comparison period. This study will make use of the ESRD Management Information System, in addition to other components of the MSS, including the PATBILL and MedPAR files. The ESRD Management Information System will provide certain information useful in describing specific clinical characteristics of ESRD beneficiaries, such as length of time since renal failure, cause of renal failure, types of dialysis therapy, and kidney transplants. Results from this study will be included in future reports to Congress.

Health Status at Discharge

This pilot study is being conducted by the Northwest Oregon Health Systems Organization and is intended to develop a method for measuring health status of patients at the time of hospital discharge and changes in discharge health status associated with PPS implementation. The results of this study are expected to prove useful in assessing functional ability and the need for post-discharge services. Data for this study will be derived from the medical records representing four hospitals in the Portland, Oregon area involving a sample of about 1,000 records. Data are being collected for selected DRGs. Results from this study will be included in future reports to Congress. A final report is scheduled for January 1987.

Analysis of Hospital Aftercare Under PPS

This pilot project is jointly sponsored by HCFA and the Assistant Secretary for Planning and Evaluation and is intended to develop a reliable methodology for assessing Medicare patients' needs for hospital aftercare services and to evaluate the appropriateness of services received after discharge. Additionally, the study methods will evaluate the psychosocial and financial factors in the post-discharge environment as these pertain to the patient and family members. The aftercare study will develop measures: first, to assess the health status of patients at the time of discharges and, second, to follow patients after discharge to survey the use, availability, and cost of aftercare services. The pilot study is intended to take 1 year and should be completed by the summer of 1987. Results will be used in a

national assessment to begin as soon as the pilot study is completed. It is expected that the national assessment will take 3 years.

The various studies underway represent a variety of methods and data sources focusing on specific aspects of quality of care. As noted by the abstracts, many of the studies currently underway employ a pre/post design to isolate the specific influences of PPS on a variety of quality indicators. Many of the current analyses rely upon data from the MSS. Other studies have supplemented the MSS through more detailed primary data collection methods. The two studies being performed for HCFA by the Rand Corporation (the "Nonintrusive Outcome Study" and the "Clinical Analysis of Quality of Care") involve clinical analysis of primary data collected from the medical record. The "Analysis of Hospital Aftercare Under PPS" will involve primary data collection in the form of patient interviews to determine the adequacy and potential barriers to post-hospital services.

Measures Used in the Current Analysis

The findings presented in this chapter are based primarily on currently available utilization and mortality measures from the MSS. These include the following:

- Discharges/1,000 Population
- Average Hospital Lengths of Stay
- Hospital Days/1,000 Population
- Hospital Readmission Rates (within 30 and 60 days)
- Deaths/100,000 Population

- Post-Admission Deaths/1,000 Discharges
- Post-Admission Deaths/1,000 Population
- Survival Time Periods (ESRD Population)

These data are supplemented with measures derived from PAS, some of which include: pre-/post-surgical lengths of stay, use of intensive care units (ICUs) and coronary care units (CCUs), numbers of hospital discharges involving the use of physician consultations, and others. In addition to the studies described above, the impact of PPS on enrollee liability is estimated.

Organization and Presentation of Findings

The remainder of this chapter presents methodological discussions and findings organized as follows:

1. Hospital Utilization
2. Issues in Evaluating Mortality Rates
3. Population-Based Mortality
4. Post-Admission Mortality
5. Hospital Readmissions
6. Enrollee Liability
7. CPHA: Hospital Use, Patient Disposition and Severity

Presentations 1 through 6 are derived from the intramural studies. The last section contains a summary of results from a study conducted by the

Commission on Professional and Hospital Activities entitled, "Impact of the Prospective Payment System on the Quality of Inpatient Care."

Hospital Utilization

This section describes pre-PPS trends and 1 year of post-PPS (1984) experience in the three basic measures of hospital utilization--discharge rates, average length of stay, and rates of days of care. Data are presented for the three entitlement categories of Medicare enrollees; enrollees 65 years of age and over, disabled enrollees under age 65, and persons entitled because of ESRD. In addition, data are examined for certain vulnerable sub-groups of the aged, such as very old enrollees and non-white enrollees. This section also examines trends in DRG-specific discharge rates, as well as trends in hospital use by geographic region.

Methods and Limitations

Data for this section were taken from two sources: (a) the inpatient hospital stay records and (b) Medicare enrollment files. The hospital stay records consist of the MEDPAR 20 percent stay file for the calendar years 1980 through 1983. These represent over two million stay records per year. For FY 1984, the data consist of the 100 percent PATBILL stay records, representing over 10 million stay records in 1984. Medicare enrollment data provided information on the population at risk for computation of rates. Measures of utilization were calculated for both PPS States and waiver States, with the waiver States serving as a comparison group to help gauge the impact of PPS. The interpretation of waiver States data must be undertaken with caution, because hospital and physician behavior in the waiver States may have been affected by the publicity given to prospective payment elsewhere. The utilization measures are "beneficiary based." That is, discharges are assigned to the residence of the beneficiary (as determined by mailing address)

regardless of where the hospital stay may have occurred. This was done because the intent of the chapter is to measure beneficiary impacts, not provider behavior; that is, beneficiary rates are constructed as opposed to provider rates.

The availability of only 1 year of post-PPS data at this time makes it difficult to identify effects due to PPS. In fact, most hospitals had less than a full year of experience under PPS in FY 1984 because of the gradual phasing-in of the new payment system. Any effects of PPS on quality of care will probably reflect changes in institutional behavior, which take some time to occur. Random variations in utilization and outcome measures over time also make it difficult to attribute any 1 year changes in these rates to a specific cause, such as PPS. It will be important to monitor subsequent years of PPS experience before conclusions can be drawn about any effects on quality of care. An analysis of other issues that increase the difficulty of assessing PPS impact is presented below.

Composite DRGs: Developing and interpreting age-specific hospitalization rates by DRG presents a problem because many DRGs are based on the age of the patient. For instance, consider the two DRGs below:

DRG	Name
180	Gastrointestinal obstruction, age greater than 69 and/or secondary diagnosis.
181	Gastrointestinal obstruction, age less than 70 without secondary diagnosis.

Separate studies of age-specific rates for these DRGs make no sense by themselves. Persons aged 70 and over will fall into DRG 180 whether a secondary diagnosis is present or not, but persons aged 65 to 69 will only be placed in DRG 180 if a secondary diagnosis is present. If the two DRGs are combined, however, then age-related variations can be examined without regard to secondary diagnosis. Therefore, to facilitate interpretation of the data, 150 DRGs were combined with other DRGs in which age was a differentiating factor. Much of the analyses in this chapter are based on these "grouped DRGs." When nongrouped DRGs are used, it will be mentioned in the text and the tables.

MedPAR/PATBILL Shortfall: The MedPAR and PATBILL files are stay records generated from the Medicare billing system. There are shortfalls due mainly to lags in receipt and processing of hospital bills. As a result, each year's stay file does not fully represent the number of stays that actually occurred during the year. This is particularly a problem for the most recent year in which processing delays have their greatest effect. To account for this shortfall, the estimated discharges were adjusted upward according to the number of admission queries occurring during the year. The admission query system is a procedure by which hospitals determine the eligibility status of patients at the time of admission. This system slightly overstates the number of Medicare covered admissions that actually take place because a small number (about 1 percent) of queries will indicate that a person has exhausted benefits or is otherwise ineligible to receive Medicare payments. Nevertheless, the admission query system has a very short lag in counting admissions (about 4 weeks) and it is not subject to processing delays as are billing records. It is, thus, the best early estimate of the volume of inpatient stays that occur in a year.

Table 4-2a shows the estimated shortfall in the MedPAR/PATBILL records for the years 1980 through 1984. As can be seen, the shortfall ranges from a low of 2.6 percent in 1982 to a high of 11.1 percent in 1984. The shortfall in 1984 was unusually high because the analytical file for this year was constructed earlier in the bill processing process than for other years. Without adjusting for the shortfall due to processing lags in 1984, the estimated drop in discharge rates that occurred in 1984 would have been 8.0 percent greater than actually occurred.

Changes were made in 1984 in the system for reporting diagnostic and procedure data on Medicare inpatient hospital claims. Before 1984, only the principal diagnosis and principal surgical procedure were reported on 20 percent of inpatient claims. Beginning in 1984, up to five diagnoses and three surgical procedures are reported on 100 percent of the claims. More importantly, PRO review of coding procedures since 1984 has presumably improved the accuracy and reliability of coding; before then, coding of diagnostic and procedure data was known to be often inaccurate (Institute of Medicine, 1977). It should also be noted that, under PPS, hospitals have an incentive to have cases assigned to the higher cost DRGs, and this incentive may also have produced changes in coding practices (Carter and Ginsburg, 1985). MEDPAR data from 1980 through 1983 were assigned DRG codes using a modified DRG grouper program.

DRG 470: Another factor complicating rate estimates over time are stay records which are uncodable into valid DRG categories. These stays are put into DRG 470 ("uncodable"). The extent to which this varies by year will affect individual DRG volume estimates. Table 4-2b shows the percent of total records

Table 4.2a

Estimated shortfall of discharges based on number of admissions, U.S., 1980-1984

Year	Number of admissions	Number of discharges	Estimated percentage shortfall
1980	10,434,202	9,537,905	-8.6
1981	10,643,132	10,160,495	-4.5
1982	11,337,700	11,044,170	-2.6
1983	11,716,430	11,365,615	-3.1
1984 (FY)	11,517,800	10,233,931	-11.1

SOURCE: MEDPAR/PATBILL files, Admission Query System

Table 4.2b

Total number of discharges for aged beneficiaries and number and percent in diagnosis-related group (DRG) 470, U.S., 1980-1984

Year	Total number discharges	DRG 470 discharges	Percent of total
1980	8,387,080	209,885	2.5
1981	8,940,795	343,610	3.8
1982	9,738,525	885,960	9.1
1983	10,055,795	448,605	4.5
1984 (FY)	9,124,035	239,642	2.6

SOURCE: MEDPAR/PATBILL Files

which were coded into DRG 470 for each of the years 1980 through 1984. As can be seen, in most years DRG 470 accounted for between 2 percent and 4 percent of all cases. However, in 1982, 9 percent of the cases were DRG 470. The increase in uncodable claims in 1982 was a temporary problem caused by a switch from narrative reporting to code reporting from the intermediaries to HCFA. Specific DRG rates were adjusted upward to account for this year-to-year variation in coding validity, under the assumption that uncodable stays occur randomly among DRGs. Although this assumption is probably an oversimplification, there was no alternative way to allocate unknowns. It should also be noted from Table 4-2b that the total number of discharges declined in 1984. More information on discharge patterns is given later in this chapter.

Calendar Year to Fiscal Year Change: Prior to the introduction of PPS, most of the beneficiary rates have been calculated on a calendar year basis. Because PPS went into effect in October 1983, a change was made to a fiscal year for the calculation of rates. This has complicated the trend analysis somewhat. First, there is an overlap of 3 months between calendar year 1983 and fiscal year 1984 data. Second, the rate of change between 1983 and 1984 is no longer a full 12 months but is only 9 months. It was decided not to try to adjust for the problem of overlap between 1983 and 1984. In any case, 1984 is a transition year and observed effects cannot be attributed entirely to PPS as about one-half of all the stays in 1984 occurred before hospitals entered into the PPS payment system. The first year in which almost all hospitals were operating under PPS for the entire year was 1985. In terms of the rate of change, this was handled by annualizing the rate of change between calendar 1983 and fiscal 1984. For example, as will be shown later, the U.S. discharge rate for aged Medicare beneficiaries was 394 per

1,000 in calendar year 1983 and 386 per 1,000 in fiscal year 1984. The unadjusted change is -2.0 percent. However, this occurred over a 9 month period. Annualizing the rate to make it more comparable with the rate of change figures in the pre-PPS period increases the estimated rate of change to -2.9 percent.

Findings

Aged Enrollees

- Population Trends

Table 4-3 shows the aged Medicare population counts for the years 1980 through 1984. Nationwide, the aged Medicare population grew from 24.6 million in 1980 to 26.5 million in 1984, an annual growth rate of about 2.0 percent. In PPS States, the growth rate was about 2.2 percent, whereas in the waiver States the growth was much less—about 1.3 percent. Overall, the waiver States accounted for 16 percent of the total U.S. Medicare aged population in 1984. Table 4-4 shows the age, sex and race composition of the Medicare aged population in 1984 for PPS and waiver States. The distributions are relatively similar in both groups of States. In both groups, males comprise about 40 percent, persons of white race comprise about 90 percent, and persons aged 65 to 69 comprise about one-third of the total population.

- Utilization Trends

The utilization data presented below cannot be interpreted in terms of

Table 4-3

Number of aged Medicare beneficiaries in PPS States and waiver States and percent change, U.S., 1980-1984

(number in thousands)

Year	U.S.	PPS States	Waiver States
1980	24,599	20,596	4,004
1981	25,079	21,033	4,046
1982	25,595	21,491	4,104
1983	26,133	21,972	4,160
1984 (FY)	26,454	22,268	4,186
Average annual percent change:			
1980-83	2.0	2.2	1.3
1983-84	1.6	1.8	0.8

SOURCE: Medicare Enrollment tables, aged beneficiaries. Counts are as of July 1 each year. 1984 enrollment was estimated as of April 1, 1984. Counts exclude aged persons with End Stage Renal Disease.

Table 4-4

Number and percent distribution of aged Medicare beneficiaries in PPS States and waiver States by age, sex, and race, U.S., 1984

(numbers in thousands)

Age, sex and race	PPS States		Waiver States	
	Number	Percent	Number	Percent
Total	22,268	100	4,186	100
Age:				
65 - 69	7,160	32	1,328	32
70 - 74	5,897	26	1,081	26
75 - 79	4,261	19	797	19
80 - 84	2,726	12	527	13
85+	2,224	10	452	11
Sex				
Male	9,013	40	1,621	39
Female	13,255	60	2,565	61
Race				
White	19,611	88	3,758	90
Other	1,993	9	320	8

SOURCE: Medicare Enrollment tables, aged beneficiaries. 1984 enrollment was estimated as of April 1, 1984. Counts exclude aged persons with End Stage Renal Disease.

appropriate levels of utilization or access. There are no accepted standards of what discharge rates should be or what are correct lengths of stay. The fact that persons aged 85 and over are hospitalized nearly twice as often as persons aged 65 to 69 is taken to indicate that these "oldest old" need twice as much hospital care, a not unreasonable proposition. No one knows whether a 50 percent differential or a 150 percent differential would be better. Many studies have shown wide geographic variations in both measures without demonstrable effects on mortality or health status in general. Usually these differences are explained as differences in "medical practice."

Table 4-5 presents Medicare discharge rates, average length of stay, and total days of care rates for the years 1980 through 1984. From 1980 through 1983 the discharge rate in the U.S. increased from 371 per 1,000 to 394 per 1,000, an average annual rate of increase of 2.1 percent. This was a continuation of the trend since 1968. The trend was somewhat lower in PPS States (2.0 percent) than in waiver States (2.5 percent). In 1984, the discharge rate declined for the first time since the beginning of Medicare. The decline was 2.9 percent. However, the change was markedly different between PPS and waiver States. The discharge rate declined by 3.5 percent in PPS States and increased 1.0 percent in waiver States. The increase in the waiver States was, however, much less than the pre-PPS trend had been. It would almost appear that the slower rate of growth in the discharge rate in waiver States represents a "spillover" effect of PPS and that providers in these States were reacting to the PPS changes in ways similar to providers in PPS States. This decline (in the PPS States) was contrary to expectations and there is no known reason for this phenomenon. Some analysts have suggested that it is a temporary phenomenon and that once hospitals and physicians adjust to the PPS

Table 4-5

Discharges per 1,000, average length of stay and total days of care per 1,000, for aged Medicare beneficiaries in the U.S., PPS States and waiver States, 1980-1984

Year	Discharges per 1,000			Average length of stay			Days of care per 1,000		
	U.S.	PPS	Waiver	U.S.	PPS	Waiver	U.S.	PPS	Waiver
1980	371	380	322	10.3	9.9	12.9	3,804	3,745	4,134
1981	371	382	316	10.1	9.7	12.5	3,733	3,695	3,942
1982	388	398	338	9.9	9.5	12.3	3,847	3,791	4,154
1983	394	403	346	9.6	9.2	12.1	3,777	3,702	4,181
1984 (FY)	386	393	349	8.7	8.3	11.5	3,371	3,241	4,030
Average annual percent change:									
1980-83	2.1	2.0	2.5	-2.3	-2.3	-2.1	-0.2	-0.4	0.4
1983-84	-2.9	-3.5	1.0	-11.5	-13.2	-5.7	-14.1	-16.2	-4.8

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

system, there will be a return to increasing rates. Others have argued that the decreased admissions represent a change in the basic practice of medicine in part due to PPS and in part due to increased emphasis on capitation and on cost containment in both the public and private sectors. In addition, attention may now be paid to possible alternatives to inpatient care.

It was in the area of length of stay that PPS had its greatest apparent effect. Unlike discharge rates, average length of stay had been declining every year prior to the start of PPS. From 1980 through 1983, it declined from 10.3 days per stay to 9.6 days per stay, an average annual decline of 2.3 percent. In 1984 the decline was .9 day, or 11.5 percent. Waiver States have historically had longer lengths of stay than the rest of the country. In 1980, there was a 3.0 day differential (9.9 days in PPS States and 12.9 days in the waiver States). During the 1980 to 1983 timespan, lengths of stay declined somewhat more rapidly in the PPS States (2.3 percent) than in the waiver States (2.1 percent). However, in 1984, there was a 13.2 percent decline in the PPS States and a 5.7 percent decline in the waiver States. Although not as large as the PPS State decline, the 5.7 percent decline in the waiver States is still almost three times as great as the historical trend, suggesting that there was some "spillover" effect in this area as well. The length of stay difference (3.2 days) between waiver States and the rest of the country was greater in 1984 than it had been in 1980.

The product of the discharge rate and the average length of stay is the total days of care rate. The rate of days of care has not changed much in the past 15 years for the Medicare aged population. Rises in the discharge rate have been offset by declines in the average length of stay. This pattern continued

through 1983. From 1980 through 1983, the total days of care rate varied little. However, the combination of a large decline in length of stay and a lesser decline in discharges lead to a 14.1 percent decline in the rate of days of care in 1984. The decline was much greater in PPS States (16.2 percent) than it was in waiver States (4.8 percent). Total days per 1,000 in waiver States, which had been 13 percent higher than in PPS States in 1983, were, in 1984, 24 percent greater than in PPS States. Such a large single year decline in the total volume of inpatient care needs to be carefully assessed in terms of appropriateness of level of care. As stated above, there are no criteria for "appropriate" levels of utilization. However, such large changes over a short period of time must be viewed with some caution as to the possible effects on the beneficiaries. The following section, dealing with quality impacts, particularly readmission rates and mortality rates will examine this issue more closely.

- Demographic Variations in Utilization Measures

A major concern is whether or not any changes in utilization rates fell disproportionately on high risk groups or groups with potential access problems. Tables 4-6, 4-7, and 4-8 present, respectively, discharge rates, average length of stay, and total days of care rates by age, sex and race categories in PPS States. The data in Table 4-6 suggest that changes in discharge rates were not disproportionately born by the highest risk groups. To the contrary, in 1984, the oldest old (age 85 and over) had a lower rate of decline (1.2 percent) than did younger age groups (5.7 percent for persons aged 65 to 69). Further, the declines were greater for males (3.9 percent) than for females (3.2 percent) and for whites (3.6 percent) than for nonwhites (2.3 percent).

Table 4-6

Discharges per 1,000 aged Medicare beneficiaries in PPS States and percent change by age, sex, and race, U.S., 1980-84

Age, sex and race	Calendar year				Fiscal year	Average annual percent change:	
	1980	1981	1982	1983	1984	1980-83	1983-84
Total	380	382	398	403	393	2.0	-3.5
Age:							
65 - 69	294	295	300	302	289	0.8	-5.7
70 - 74	353	354	368	374	362	1.9	-4.0
75 - 79	424	426	445	453	442	2.2	-3.2
80 - 84	487	493	518	526	514	2.6	-2.9
85+	532	531	561	569	564	2.3	-1.2
Sex							
Male	409	409	421	428	415	1.5	-3.9
Female	361	363	382	387	377	2.4	-3.2
Race							
White	387	388	403	409	398	1.9	-3.6
Other	437	440	471	483	475	3.4	-2.3

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Table 4-7

Average length of stay (days) for aged Medicare beneficiaries in PPS States and percent change by age, sex, and race, 1980-1984

Age, sex and race	Calendar year				Fiscal year	Average annual percent change:	
	1980	1981	1982	1983	1984	1980-83	1983-84
Total	9.9	9.7	9.5	9.2	8.3	-2.3	-13.2
Age:							
65 - 69	9.1	8.9	8.8	8.5	7.7	-2.2	-12.4
70 - 74	9.5	9.4	9.2	8.9	8.0	-2.3	-12.8
75 - 79	10.0	9.9	9.7	9.3	8.4	-2.4	-13.4
80 - 84	10.5	10.3	10.1	9.7	8.6	-2.6	-14.3
85+	10.9	10.7	10.5	10.0	8.9	-2.7	-14.3
Sex							
Male	9.5	9.4	9.3	9.0	8.1	-2.0	-12.6
Female	10.1	9.9	9.7	9.3	8.4	-2.6	-13.7
Race							
White	9.7	9.6	9.4	9.1	8.2	-2.4	-13.1
Other	10.9	10.8	10.6	10.2	9.1	-2.2	-14.2

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Table 4-8

Total days of care per 1,000 aged Medicare beneficiaries in PPS States and percent change by age, sex, and race, 1980-1984

Age, sex and race	Calendar year				Fiscal year	Average annual percent change:	
	1980	1981	1982	1983	1984	1980-83	1983-84
Total	3,745	3,695	3,791	3,702	3,241	-0.4	-16.2
Age:							
65 - 69	2,674	2,627	2,632	2,562	2,220	-1.4	-17.4
70 - 74	3,374	3,324	3,400	3,331	2,916	-0.4	-16.3
75 - 79	4,262	4,201	4,320	4,231	3,706	-0.2	-16.2
80 - 84	5,102	5,079	5,237	5,094	4,439	-0.1	-16.8
85+	5,783	5,663	5,882	5,702	5,032	-0.5	-15.4
Sex							
Male	3,898	3,844	3,897	3,836	3,368	-0.5	-15.9
Female	3,639	3,592	3,719	3,611	3,155	-0.3	-16.5
Race							
White	3,763	3,710	3,794	3,702	3,241	-0.5	-16.2
Other	4,760	4,730	4,995	4,932	4,321	1.2	-16.2

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Table 4-7 presents the trend in average length of stay for Medicare beneficiaries for the years 1980 through 1984 by age, sex and race. Lengths of stay are directly related to the age of the patient. However, the trend has been to narrow the age difference. In 1980, persons aged 85 and over had an average length of stay of 1.8 days longer than persons aged 65 to 69 (10.9 days and 9.1 days, respectively). By 1983 this difference had decreased to 1.5 days (10.0 days and 8.5 days, respectively). All age groups experienced large declines in average length of stay in 1984, with the largest decline experienced by persons 80 and over (14.3 percent). There now exists only a 1.2 day differential in length of stay between the oldest and the youngest aged Medicare beneficiaries.

The changes in discharge rate and average length of stay by age, sex, and race largely offset each other in the days of care rate (Table 4-8). That is, males had a larger decline in discharges, but females had a larger decline in length of stay. The result is virtually no difference between males and females in the decline in days of care. The rate of decline was also similar for whites and members of other races. By age group, persons aged 65 to 69 had a slightly greater decline in days of care than did persons aged 85 and over (17.4 percent and 15.4 percent, respectively).

- DRG Specific Use Rates

There were 80 DRGs or grouped DRGs which appeared in the 100 most frequent DRGs in each of the 5 years 1980 to 1984. Because many of these were

grouped DRGs, they actually represent 152 of the total 470 possible DRGs. In each of the 5 years, these 80 DRGs or DRG groups account for about 80 percent of the total Medicare aged discharges. Although the total discharge rate and average length of stay declined, it is of interest to determine the extent to which these phenomena were consistent across various DRGs.

During the period 1980 to 1983, in the PPS States, 55 of the 80 DRGs had increasing discharge rates. During the same time, 50 of these DRGs had increasing discharge rates in the waiver States. In 1984, only 33 DRGs had increasing discharge rates in the PPS States while 46 continued to rise in the waiver States. Table 4-9 presents the discharge rates by year for the 20 most common DRGs in 1980 (these accounted for 48 percent of all aged hospital stays in the PPS States in that year).

These figures probably represent a combination of changing practice patterns due to PPS incentives as well as changes in coding due both to reimbursement incentives and a much richer source of data in the 1984 PATBILL information. In 1980, atherosclerosis (132-133) was one of the most common DRGs. However, in both the pre-PPS period and especially in 1984 the frequency of this combination decreased dramatically to the point where it is among the least common of the top 20 DRGs in both PPS and waiver States. Acute myocardial infarction (121-122) remained relatively unchanged in both PPS (1.5 percent increase per year) and waiver States (1.4 percent increase per year) during 1980 to 1983. However, it increased in 1984 by 32.9 percent in PPS States and by 11.5 percent in waiver States. Such a dramatic change cannot be due to changes in the epidemiology of heart disease nor is it likely due to a radical

Table 4-9

Discharges per 1,000 aged Medicare beneficiaries and percent change for PPS States and waiver States for 20 most common diagnosis-related groups in 1980, U.S., 1980-1984

Diagnosis-related group	Title*	Discharges per 1,000 in PPS States Calendar year				Fiscal year	Average annual percent change:		Discharges per 1,000 in waiver States Calendar year				Fiscal year	Average annual percent change:	
		1980	1981	1982	1983	1984	1980-83	1983-84	1980	1981	1982	1983	1984	1980-83	1983-84
	All Discharges	380	382	398	403	393	2.0	-3.5	322	316	338	346	349	2.5	1.0
132-133	ATHEROSCLEROSIS	19.9	17.9	17.0	11.5	5.5	-16.6	-63.0	12.0	8.9	6.8	5.5	3.9	-22.7	-37.3
182-184	ESO/GASTRO/MISC DIG	19.8	19.3	20.0	19.4	17.7	-0.6	-11.8	11.6	11.3	11.5	12.5	12.5	2.3	0.3
127	HEART FAIL & SHOCK	16.6	15.1	15.8	17.1	18.7	5.5	12.3	13.8	16.2	17.0	18.7	18.4	5.6	-2.3
039	LENS PROCEDURES	12.7	14.0	15.0	17.5	16.4	11.3	-8.1	12.1	13.1	14.2	17.0	18.9	12.2	14.8
014	SPEC CEREBRO. DIS	11.0	10.7	11.2	11.7	12.1	2.2	3.7	10.0	10.0	10.1	10.8	10.4	2.6	-4.3
089-091	PNEUMONIA	11.0	11.4	10.9	12.4	12.7	4.0	3.3	9.1	8.5	8.2	9.9	10.2	3.0	4.0
468	UNRELATED OR PROC	9.9	8.3	8.0	7.6	5.5	-8.6	-33.2	8.7	7.3	7.2	7.2	6.7	-6.1	-8.5
121-123	AMI	9.3	9.3	9.5	9.8	12.1	1.5	32.9	10.7	10.7	10.7	11.1	12.1	1.4	11.5
088	CHR OBSTR PUL DIS	9.9	10.2	10.2	9.9	7.9	0.0	-23.8	6.6	6.4	6.4	7.1	6.7	2.5	-7.5
294-295	DIABETES	8.1	7.4	7.5	6.2	5.0	-8.4	-23.8	6.3	5.5	5.0	5.1	5.4	-6.6	7.3
138-139	CARD ARRHYTHMIA	6.4	7.1	7.7	8.9	9.0	11.3	1.8	6.5	6.5	7.0	7.9	8.9	6.6	18.4
243	BACK PROBLEMS	6.7	6.8	7.2	7.3	7.5	3.5	-0.3	4.7	4.8	4.8	5.2	5.2	3.8	-0.5
096-098	BRONCHITIS	6.7	6.7	6.6	7.4	7.5	3.4	2.5	4.5	4.4	4.3	5.0	5.4	3.4	10.8
140	ANGINA	5.8	6.2	7.0	9.1	10.6	16.5	21.7	7.5	8.7	9.6	11.2	11.5	14.2	3.4
130-131	PERIPH VAS DIS	6.0	5.7	5.7	5.0	4.2	-5.4	-22.7	4.2	3.9	4.0	3.9	3.8	-2.5	-3.3
320-322	KID INFECT.	5.6	5.6	5.9	6.0	5.8	2.4	-4.4	3.4	3.3	3.5	3.8	3.9	4.7	2.0
134	HYPERTENSION	5.4	5.3	5.7	4.6	2.9	-5.4	-44.6	3.6	3.2	3.0	2.8	2.4	8.0	-17.1
015	TR ISCHEMIC ATT	5.1	5.4	5.6	6.2	6.8	6.9	13.6	4.8	5.1	5.4	6.0	5.8	7.5	-4.2
336-337	PROSTATECT.	12.4	12.1	11.2	14.0	17.6	4.1	39.5	11.7	11.9	12.3	14.1	14.4	6.3	3.0
082	RESPIRATORY NEOPLASMS	4.6	4.9	5.1	5.3	4.5	4.8	-18.4	4.4	4.5	4.7	4.9	4.7	3.9	-4.4

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984 Discharge Rates for Prostatectomies are based on male enrollment only.

*For a complete listing of DRGs see Federal Register, Part III, Department of Health and Human Services, Health Care Financing Administration: 42 CFR Parts 403 and 412, Tuesday, September 3,1985.

change in the treatment of acute myocardial infarctions. The most likely cause is changes in coding practices. Indeed there appears to have been a good deal of coding changes that occurred within the Major Diagnostic Group (MDC) relating to heart and circulatory disorders. In addition to atherosclerosis, which declined by 63.0 percent from 1983 to 1984, there were large declines in PPS States in peripheral vascular disorders (22.7 percent) and hypertension (44.6 percent). Besides acute myocardial infarction, there were large increases in PPS States in angina (21.7 percent) and heart failure and shock (12.3 percent) from 1983 to 1984. Not surprisingly, those that decreased had reimbursement weights of less than 1.0 while those that increased (with the exception of angina) had weights of greater than 1.0. This does not mean that providers are "gaming" the system or inappropriately coding diagnoses. More likely, much of it probably represents a more accurate coding of DRGs based on the additional information available on the hospital claim.

Other changes are less obviously explainable to coding changes. For instance, transurethral resection of the prostate (336-337) rose by 35.5 percent in PPS States and only 3.0 percent in waiver States from 1983 to 1984. However, the relative weight of this procedure, 1.025, suggests that it is unlikely to be an extremely high income generating procedure. Respiratory neoplasms (082), with a relative weight of 1.2069, experienced a decline of 18.4 percent in PPS States and 4.4 percent in waiver States. Respiratory neoplasms accounted for over 105 thousand discharges in 1984. There is no apparent reason why discharge rates would decrease so greatly for such a serious ailment.

One procedure that changed in the expected direction was lens extraction (039, with a relative weight of .5110). Given the low weight for this procedure it was expected that this was a procedure that would be shifted to the outpatient setting. This has apparently taken place. Prior to PPS, lens extractions were rising in both PPS States (11.3 percent per year) and waiver States (12.2 percent per year). In 1984, however, lens extractions fell by 8.1 percent in PPS States while rising by 14.8 percent in waiver States.

In sum, the DRG-specific discharge rates are difficult to interpret. The decline of lens extractions is in the expected direction and seems to be a reasonable change for such an elective procedure which has an alternative delivery site. However, other changes, particularly the increases in acute myocardial infarction and prostatectomies and the decreases in respiratory neoplasms, are so large that it seems more likely that coding changes must be the major explanation. These data suggest that analyses of DRG-specific changes from the pre-PPS period to the post-PPS period should be undertaken and interpreted with extreme caution.

This cautionary note has to be considered in evaluating changes in length of stay as well. Much of the observed changes in length of stay within DRGs could be due as much to a reshuffling of cases between DRGs as it is to underlying changes in the treatment patterns. Given this caveat, it is still of interest to explore the apparent changes in length of stay by DRG. When examining the 80 most frequent DRG combinations, there can be little question that the decline in length of stay is an across-the-board phenomenon. In the PPS States, 54 of the 80 DRGs were experiencing declines in length of stay between 1980 and 1983. In

1984, all 80 had a lower length of stay. In the waiver States, the change was less dramatic. For 53 DRGs, length of stay was declining in the pre-PPS period and 68 declined in 1984.

Table 4-10 shows the length of stay changes in PPS and waiver States for the 20 DRGs with the longest lengths of stay in the U.S. in 1980. The DRG categories with long lengths of stay are about evenly split between medical and surgical cases. Many of the medical cases are related either to mental illness/psychoses or to malignancies. Among the surgically related DRGs with long lengths of stay are major procedures on joints, the stomach, the bowels and major reconstructive vascular procedures (included in here are coronary bypass surgeries). In PPS States, in every case the 1984 decline was greater than the pre-PPS trend (in some cases the pre-PPS trend was an increasing length of stay). This was not the situation in the waiver States. The 1984 trend was occasionally a lower rate of decline and occasionally an increase in length of stay.

Some of the declines in length of stay need to be assessed in terms of the continuity of care, the aftercare issue, and the perceived problem of premature discharge. For instance, hip and femur procedures (including reduction, fracture of femur - except major joint, 210-212) declined in 1984 by 1.6 days. A related DRG, fracture of the hip and pelvis (236) declined by 2.9 days (in waiver States the decline for fracture of the hip and pelvis was 4.3 days). As discussed above, part of the change could be due to more detailed reporting requirements on the claim form. However, to the extent that these changes are real and not a data artifact, potential problems with the continuity of care for patients who are in a prolonged stage of recuperation should be investigated. This is the intent of the

Table 4-10

Average length of stay for aged Medicare beneficiaries and percent change for PPS States and waiver States for the 20 diagnosis-related groups with longest stays in 1980, U.S., 1980-1984

Diagnosis-related group	Title*	Average length of stay in PPS States Calendar year				Fiscal year	Average annual percent changes		Average length of stay in waiver States Calendar year				Fiscal year	Average annual percent changes	
		1980	1981	1982	1983	1984	1980-83	1983-84	1980	1981	1982	1983	1984	1980-83	1983-84
	All Discharges	9.9	9.7	9.5	9.2	8.3	-2.3	-13.2	12.9	12.5	12.3	12.1	11.5	-2.1	-5.7
210-212	HIP/FEM PROCS	19.6	19.4	18.3	17.3	15.7	-4.2	-12.4	26.3	26.4	25.4	23.2	23.8	-4.1	3.5
148-149	MAJ BOWEL PROCS	19.6	18.7	18.6	17.8	16.9	-3.1	-6.8	22.7	21.8	21.5	20.6	20.1	-3.2	-2.9
154-156	STO/ESO/DUO PROCS	19.6	17.7	16.5	15.7	13.9	-7.2	-14.7	22.2	20.3	18.7	18.1	17.7	-6.6	-3.3
209	MAJ JOINT PROCS	19.0	18.5	17.8	16.7	15.4	-4.2	-10.3	24.5	22.8	22.7	21.7	20.6	-4.0	-6.8
110-111	MAJ RECON VASC PROCS	17.1	16.7	16.3	15.9	15.2	-2.5	-6.0	20.5	20.6	20.2	18.9	18.9	-2.8	0.2
468	UNRELATED OR PROC	16.4	16.1	16.0	15.9	15.3	-1.0	-4.8	21.7	20.9	21.5	21.1	22.8	-1.0	10.7
430	PSYCHOSES	15.7	15.4	15.7	16.3	14.1	1.2	-17.5	21.8	20.3	22.0	22.9	21.0	1.6	-11.1
271	SKIN ULCERS	15.8	15.9	15.9	15.6	12.3	-0.4	-27.4	19.5	19.5	20.8	21.2	18.3	2.7	-17.3
236	FRACT HIP/PELVIS	15.0	14.6	15.0	13.9	11.0	-2.3	-26.7	20.4	20.2	20.9	23.3	19.0	4.4	-23.5
112	VASC PROCS EXC MAJ REC	14.8	14.8	14.9	13.9	11.5	-2.1	-22.6	19.3	18.3	17.1	17.3	17.3	-3.6	0.1
195-198	CHOLECYSTECTOMY	14.0	13.8	13.3	13.3	12.3	-1.8	-10.0	16.4	15.5	15.9	15.4	14.9	-2.1	-4.6
426	DEPRESSIVE NEUROSES	13.5	13.2	13.9	13.3	10.3	-0.4	-29.2	19.2	17.4	20.3	17.7	19.6	-2.8	14.6
416-417	SEPTICEMIA	13.1	12.9	12.7	12.4	10.8	-1.7	-16.8	16.0	16.5	17.2	15.6	15.5	-0.8	-1.5
012	DEGENERATIVE NERVOUS SYS DIS	12.2	12.8	12.5	12.4	10.3	0.4	-21.7	18.3	17.1	17.9	17.7	15.9	-1.1	-13.6
203	MALIG - LIP, PAN	11.9	11.7	11.6	10.9	9.4	-2.8	-18.2	14.8	14.3	13.8	13.5	12.5	-3.1	-9.1
429	ORG DIST & MJR.	11.5	11.4	10.9	10.6	9.4	-2.7	-15.1	18.3	16.5	17.6	16.8	16.0	-2.9	-6.4
005	EXT CRANIO VASC PROCS	12.1	11.9	11.2	10.6	9.6	-4.4	-12.7	13.9	15.0	12.9	12.4	12.4	-3.7	-0.1
316	RENAL FAIL	11.7	11.6	11.9	11.7	10.0	0.0	-19.3	15.4	14.9	15.7	15.9	14.4	1.0	-12.3
172-173	DIGEST MALIG	11.6	11.6	11.6	11.4	9.1	-0.6	-25.5	14.7	14.3	14.7	14.9	13.2	0.3	-14.3
082	RESPIRATORY NEOPLASMS	11.3	11.0	10.7	10.4	9.1	-2.6	-15.8	14.7	13.5	13.8	13.6	12.4	-2.5	-11.5

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

*For a complete listing of DRGs see Federal Register, Part III, Department of Health and Human Services, Health Care Financing Administration 42 CFR Parts 405 and 412, Tuesday, September 3,1985.

aftercare study described earlier. Complicating this issue is the large difference in length of stay between waiver and PPS States. For these DRGs (210-212 and 236) the lengths of stay in waiver States are about 8 days longer than in PPS States.

Another area of concern with respect to discharge planning is the mental illness/psychoses cases. Depressive neuroses (426), organic disturbances and mental retardation (429) and psychoses (430) experienced decreased lengths of stay in PPS States in 1984 of 3.0 days, 1.2 days, and 2.2 days, respectively. It is important to know the destination of persons who are discharged with these DRGs.

- Regional Variation in Average Length of Stay

Prior to the implementation of PPS there were wide variations in average lengths of stay across States and regions of the country (Gornick, 1982). For instance, in 1977 the Northeast had average lengths of stay which were 22 percent longer than the national average, while the West had lengths of stay which were 14 percent below the national average. In addition, regional variation had been increasing over time. These data are shown in Table 4-11. From 1967 to 1977 there was a decrease in average length of stay across all census regions. However, the rate of decline was greatest in the West (where lengths of stay were the lowest to begin with) and least in the Northeast (where lengths of stay were the highest to begin with). Lengths of stay in both the Northeast and the West were further from the national average in 1977 than they

Table 4-11

Average length of stay for aged Medicare beneficiaries by census region, 1967 and 1977

Census region	Average length of stay (days)		Ratio: Region to U.S.	
	1967	1977	1967	1977
U.S.	13.8	10.9	1.00	1.00
Northeast	16.1	13.3	1.17	1.22
North Central	14.6	11.1	1.06	1.02
South	12.3	10.0	.89	.92
West	11.8	8.9	.86	.82

SOURCE: "Trends and Regional Variations in Hospital Use Under Medicare" Health Care Financing Review. Volume 3, Number 3 page 57.

were in 1967, whereas lengths of stay in the North Central and South regions more nearly approached the national average in 1977.

Because payments under PPS are unrelated to length of stay (except for outliers) it was expected that not only would lengths of stay decrease in general but that some of the regional variation might decline as well. This is based on the assumption that there is more room for reduction in those regions where lengths of stay are longer to begin with. Table 4-12 presents length of stay data by region for the years 1981 through 1985. Although the Northeast has been included in this table it does not figure in the following discussion because the figures for this region are dominated by waiver States and the concern here is to determine whether or not there has been a leveling of length of stay where PPS has been implemented.

In 1981, average lengths of stay in the North Central, South, and West regions were 10.7 days, 9.7 days, and 8.7 days, respectively. The North Central and South stays were 23 percent and 11 percent longer, respectively, than stays in the West. Lengths of stay declined in all three regions by comparable amounts between 1981 and 1983 so the relative difference between the regions was about the same in 1983 as it was in 1981. However, there has been a noticeable change since 1983. From 1983 to 1985, the annual rate of decline in length of stay was 11.0 percent in the North Central region, 8.6 percent in the South and 7.7 percent in the West. As a result, the relative difference across regions has decreased. In 1985, lengths of stay in the North Central and South regions were only 16 percent greater and 10 percent greater, respectively, than in the West. In terms of absolute difference, in 1983 length of stay was 2.0 days greater in

Table 4-12

Average length of stay for aged Medicare beneficiaries
by census region, U.S., 1981-1985

Region	Year					Annual compound rate of growth	
	1981	1982	1983	1984	1985	1981-83	1983-85
U.S.	10.5	10.3	10.0	9.1	8.4	-2.4	-8.5
Northeast	12.8	12.8	12.4	11.6	10.8	-1.9	-6.5
North Central	10.7	10.5	10.2	8.9	8.1	-2.3	-11.0
South	9.7	9.5	9.3	8.4	7.7	-2.3	-8.6
West	8.7	8.5	8.2	7.5	7.0	-2.6	-7.7
Relative LOS							
North Central to West	23	24	24	19	16		
South to West	11	12	13	12	10		

SOURCE: Admission Pattern Monitoring System
Bureau of Data Management and Strategy: HCFA

the North Central than in the West. In 1985 the difference declined to 1.4 days. Thus, it appears that there has been some compression in length of stay variation by region. Because this was not occurring prior to PPS and because it did not occur in the Northeast, where PPS was largely not a factor, it would seem that an effect of PPS has been to partially standardize length of stay practice patterns in the U.S.

- Decreases In Covered Days

Not all of the days spent in a hospital by a Medicare beneficiary are necessarily covered by Medicare. Days which are deemed to be unnecessary for acute care are typically not covered for payment by Medicare. This has been true since before the beginning of PPS. However, the incentives are distinctly different under PPS. Under the cost based system, it was in the hospital's interest to include as many days as possible as medically necessary because Medicare would continue to reimburse the hospital for extra days. Under the fixed payment mechanism of PPS, as has been seen above, the incentives to reduce length of stay did result in reductions in covered days. However, it is possible that, if placement to an alternative setting such as ICFs or home health care is a problem, then the total days spent in the hospital will not decline as much as covered days. The beneficiary would then be at risk for the difference between the total days in the hospital and the covered days.

Table 4-13 shows the total and covered lengths of stay for selected DRG categories (ungrouped) in 1981 and 1984 as well as the lengths of stay across all discharges. In 1981 the total length of stay was 10.3 days and the covered length

Table 4-13

Total and covered days of care per stay and percent difference for selected diagnosis-related groups, U.S., 1981 and 1984

Diagnosis-related group	Title*	1981 Days of care per stay		Percent diff.	1984 Days of care per stay		Percent diff.	Percent change 1981-84
		Total	Covered		Total	Covered		
Total	All Discharges	10.3	10.1	97.6	8.8	8.6	97.3	-0.3
429	ORG DIST & M.R.	13.7	12.0	87.6	11.6	10.4	89.5	1.9
236	FRACT HIP/PELVIS	17.0	15.4	90.7	12.6	11.7	92.9	2.2
012	DEGEN NERVOUS SYS DI	14.1	13.2	93.8	12.9	12.2	94.3	0.5
240	BONE DIS+ SPETIC ATH	10.1	9.5	94.3	7.9	7.5	95.3	0.9
172	DIGEST MALIG	13.0	12.3	94.5	10.1	9.7	96.1	1.6
014	SPEC CEREBRO. DIS	15.4	14.6	94.9	12.4	11.9	95.6	0.8
416	SEPTICEMIA	14.2	13.5	94.9	11.3	11.0	97.3	2.4
180	G. I. OBSTRUC	9.1	8.7	95.1	7.5	7.2	96.1	1.1
430	PSYCHOSES	16.5	15.7	95.4	16.0	15.5	96.8	1.4
296	NUTRI/MIS METABOL DI	10.5	10.0	95.6	8.3	7.9	95.7	.0
079	RESP INFECT	16.2	15.5	95.8	12.7	12.4	97.6	1.8
253	SPRNS, STRNS	9.9	9.5	95.9	7.6	7.3	96.6	0.7
020	SEIZURE & HEADACHE	8.1	7.8	95.9	6.9	6.7	96.5	0.6
130	PERIPH VAS DIS	10.6	10.2	95.9	8.1	7.8	96.0	0.1
316	RENAL FAIL	11.0	10.6	96.0	9.7	9.3	95.5	-0.5
239	PATH FRACT+ MALIG	13.4	12.9	96.0	10.4	10.2	98.0	1.9
207	DUS BUKUART TRCT	9.0	8.7	96.3	6.9	6.8	98.1	1.8
188	OTH DIGEST DIAG	7.8	7.5	96.5	6.3	6.1	96.7	0.1
277	CELLULITIS	11.0	10.6	96.5	9.1	8.8	96.7	0.2
469	TOX EFF DRUGS	8.0	7.7	96.6	6.3	6.2	98.6	1.9

SOURCE: 1981 and 1984 MEDPAR files.

NOTE: These are the 20 DRGs with the greatest descrepancy between total and covered days in 1981. The total is for all discharges, not just the 20 listed in the table.

This table is based on ungrouped DRG categories.

of stay was 10.1 days, a difference of .2 days. The reductions in covered days were essentially matched by a comparable reduction in total days in 1984. The ratio of covered to total days declined very slightly from 97.6 percent in 1981 to 97.3 percent in 1984.

In 1981 there were a few DRGs in which there was a more substantial difference between total and covered days. There were only seven DRGs in which less than 95 percent of the total stay was covered for Medicare reimbursement. The greatest discrepancy was for organic disturbances and mental retardation (DRG 429) and fractures of the hip and pelvis (DRG 236). For organic disturbances and mental retardation, the total average length of stay was 13.7 days and the average covered length of stay was 12.0 days, a difference of 1.7 days. For fractures of the hip and pelvis, the difference was 1.6 days (17.0 and 15.4 days, respectively). In both cases, the reduction in total days in 1984 was slightly larger than the reduction in covered days. Thus, the percent of the stay covered by Medicare rose slightly. For instance, in 1981 Medicare covered, on average, 87.6 percent of total inpatient days for organic disturbances and mental retardation. In 1984, Medicare covered 89.5 percent of the total days for this DRG. This was true for 19 of the 20 DRGs listed in Table 4-13. However, the changes from 1981 to 1984 for any DRG category were slight. Essentially, Medicare covers almost all of the days spent in an inpatient setting and this was true both before PPS and during the first year of implementation. In fact, for those persons approaching exhaustion of their lifetime reserve days, PPS regulations provide more coverage than under the previous cost based system. That is, if a person exhausts his lifetime reserve days during an inpatient stay the person remains covered until discharge or until the outlier threshold is

reached. However, only .4 percent of beneficiaries exhaust their lifetime reserved days before dying. Thus it is unlikely that exhaustion of lifetime reserve days explains the difference between covered and total days.

- Length of Stay Truncation

One of the criticisms of the way in which the PPS system has been implemented has been in the use and understanding of the average length of stay by DRG. Critics assert that many hospital administrators and physicians are treating the average length of stay as the maximum length of stay or, alternatively, as the length of stay that Medicare will pay for. As a result, it is argued, Medicare beneficiaries are being told that Medicare will no longer cover their stay after this "limit" (the average length of stay) has been reached. The issue of premature discharge ("quicker and sicker") is directly related to this criticism. It is because of this confusion of the average as the maximum or allowable length of stay (it is argued) that some patients may be inappropriately discharged.

If, in fact, there has been widespread use of the average as the maximum, then it should show up in the distribution of lengths of stay within DRG category. Table 4-14 presents length of stay data on the 20 DRGs with the longest lengths of stay in 1981. The table includes average length of stay, the coefficient of variation, and the length of stay of the 90th percentile, for 1981 and 1984. The coefficient of variation is the ratio of the standard deviation to the average length of stay. It is a measure of dispersion of stays around the average. A high coefficient of variation means that the stays are widely dispersed around the

Table 9-19

Average length of stay (ALOS) for aged Medicare beneficiaries, coefficient of variation, ALOS at 90th percentile and percent changes, for top 20 diagnosis-related groups with longest ALOS in 1981, U.S., 1981 and 1986

Diagnosis-related group 1/	Title*	1981 ALOS	1981 Coeff. VAR.	1981 ALOS at 90th Perct.	1981 Percent greater 90th to ALOS	1986 ALOS	1986 Coeff. VAR.	1986 ALOS at 90th perct.	1986 Percent greater 90th to ALOS	Percent Changes: 1981-86 ALOS	Percent Changes: 1981-86 Coeff. VAR.	Percent Changes: 1981-86 ALOS at 90th Perct.	Percent Changes: 1981-86 90th to ALOS
Total	All Dischargers	10.3	1.16	21.0	100	8.8	1.22	17.6	100	-13	+0.06	-17	-0
210	HIP/FEM PROCS	21.2	0.76	33.9	69	16.7	0.81	26.9	61	-21	0.07	-25	-8
148	MAJ BOWL PROCS	20.2	0.76	34.6	71	17.6	0.70	29.7	69	-13	-0.06	-16	-3
209	MAJ JOINT PROCS	19.3	0.68	29.7	54	15.6	0.63	23.3	51	-19	0.05	-21	-3
130	STO/ESO/DUO PROCS	18.8	0.79	33.2	87	13.0	0.81	29.6	92	-18	0.02	-16	3
110	MAJ,RECON VAS PROCS	18.4	0.80	33.0	79	16.2	0.77	28.6	77	-12	-0.03	-11	-3
236	FRACT HIP/PELVIS	17.0	0.90	32.7	92	12.6	1.13	23.6	87	-26	0.19	-28	-5
068	UNRELATED OR PROC	17.0	1.06	35.3	108	16.6	1.12	33.3	101	-2	0.06	-6	-7
030	PSYCHOSES	16.3	0.90	34.9	112	14.0	0.91	33.0	109	-3	-0.07	-6	-3
107	CORON BY BYPASS	16.3	0.60	26.4	62	14.4	0.68	23.3	63	-12	0.08	-11	1
079	RESP IN EGT	16.2	0.99	32.1	98	12.7	0.96	23.9	88	-22	-0.03	-26	-10
014	SPEC CI REMO. DIS	13.6	1.18	31.9	107	12.4	1.30	29.9	97	-19	0.16	-20	-10
416	SEPTICEMIA	10.2	1.10	20.3	101	11.3	1.01	21.0	86	-20	-0.09	-26	-13
012	DEGEN NERVOUS SYS DI	10.1	1.22	28.8	108	12.9	1.26	28.0	117	-9	0.04	-3	13
197	CHOLES SYSTECTOMY	10.0	0.63	23.3	66	11.7	0.66	19.4	66	-16	0.03	-17	-1
429	ORG MSF & M.R.	13.7	1.33	26.7	95	11.6	1.18	22.0	98	-13	0.13	-18	-3
239	PATH FRACT+ MALIG	11.6	1.06	27.4	108	10.9	0.91	20.1	93	-22	-0.13	-27	-11
172	DIGE T MALIG	13.0	1.06	29.1	120	10.1	1.10	21.3	113	-22	0.04	-26	-11
005	EXTRA CRAN VASC PROC	12.3	0.91	22.2	80	9.4	0.87	17.0	81	-24	-0.04	-23	0
403	LYMPH+LEUKEMIA	11.8	1.14	26.8	127	11.0	1.08	24.7	123	-7	-0.06	-8	-3
082	RESPIRATORY NEOPLASM	11.7	1.04	23.5	118	9.7	1.00	20.4	110	-17	-0.04	-20	-8

SOURCE: 1981 and 1986 MEDPAR Files

1/ This table is based on ungrouped DRG categories.

*For a complete listing of DRGs see Federal Register, Part III, Department of Health and Human Services, Health Care Financing Administration; 42 CFR Parts 403 and 412, Tuesday, September 1,1983.

average. A low coefficient of variation means that the stays are more tightly bunched around the average. If hospitals are truncating stays at or around the average, one would expect to see a decline in the coefficient of variation. The 90th percentile also gives some indication of how widely lengths of stay are distributed. The 90th percentile means that 10 percent of stays are longer than this amount and 90 percent of the stays are shorter than this amount. Given that the average length of stay declined in 1984, one would expect the 90th percentile to decline as well. However, if significant truncation was occurring as well, the 90th percentile would be expected to be relatively closer to the mean.

As shown in Table 4-14, the overall length of stay in 1981 was 10.3 days. The coefficient of variation was 1.14 and the 90th percentile was 21.0 days (about twice the average). By 1984, the average length of stay had declined by 15 percent to 8.8 days and the 90th percentile had declined by 17 percent to 17.6 days. Thus the 90th percentile is marginally closer to the average in 1984 than it was in 1981. On the other hand, the coefficient of variation increased from 1.14 to 1.22. This means that the variation around the average was relatively greater in 1984 than in 1981.

For the DRGs with long lengths of stay, there was generally some narrowing of the difference between the 90th percentile and the average. In 17 of the 20 DRG categories the 90th percentile decreased more than did the average. The greatest change occurred for septicemia (DRG 416) where the average length of stay decreased by 20 percent and the 90th percentile decreased by 26 percent. The coefficient of variation increased in 11 DRG categories and decreased in 9 categories. The largest increase in variation (.33)

was for organic disturbances and mental retardation (DRG 429), and the largest decrease (-.15) was for pathological fractures, musculoskeletal and connective tissue malignancy (DRG 239). The data seem to indicate that there have been somewhat greater decreases in lengths of stay at the tail end of the distribution of stays, but that the relative variation of stays has remained about the same. Therefore, there is little evidence that truncation of stays has occurred at the national level.

- Summary

Most of the data presented in this section are current only through FY 1984. As such, they represent a transitional period of PPS. The 1984 data are actually a combination of both pre-PPS and post-PPS hospital behavior. In addition, the data represent considerable changes in the coding practices of hospitals compared to the 1983 and earlier years. Despite these shortcomings, some conclusions seem warranted.

First, it is obvious that there were major changes in discharge rates and average length of stay in 1984 compared to previous trends. Discharge rates declined for the first time since the beginning of Medicare. Because a similar decline did not take place in waiver States, it suggests that this was primarily a PPS effect. Average length of stay also declined, and at a rate much greater than the historical trend would have indicated. Once again, the decline was greater in PPS States than in waiver States, strongly suggesting that the effect was primarily due to PPS.

When examined by age, sex, and race categories, there is no evidence of systematic changes in discharge rates or average length of stay that would indicate that high risk groups such as the oldest old or minorities were disproportionately affected by PPS. The relative variations in utilization measures by demographic categories remained the same in 1984 as it was in prior years.

DRG specific changes are very hard to interpret. In particular, some of the DRG changes within MDC categories (e.g., cardiovascular conditions) strongly suggest that the observed changes may be due to conversions to the new data requirements on the PATBILL, rather than true changes in rates of discharge or average length of stay.

The issue of premature discharging, or "quicker and sicker," cannot be addressed using the data presented in this chapter. However, there is some evidence that patients are not routinely being discharged once the average length of stay for a given DRG is reached. There is still quite a bit of variation in lengths of stay within DRG categories. Secondly, there is no evidence that patients are being made liable for additional inpatient days beyond what Medicare will pay for. The amount of noncovered days per stay has remained essentially the same as before PPS.

One area in which PPS has had an expected effect is on regional variations in lengths of stay. Excluding the Northeast region of the country which includes mostly waiver State behavior, the other three regions are closer in average length of stay than prior to PPS. Thus, it appears that the fixed reimbursement

nature of PPS, or perhaps the impact of the published average length of stays by DRG, is leading to more homogeneous practice patterns, at least in terms of length of stay.

Despite the absence of adverse effects in this analysis, this does not prove that premature discharging or truncating lengths of stay at the average do not occur. Of necessity, this analysis has examined the national experience with PPS. This was done to determine whether or not there are system-wide impacts of PPS which are adverse to beneficiaries. It appears that, as of 1984, there are not. However, there are some 5,400 individual hospitals currently operating under PPS. A small number of these hospitals could, on occasion, be misusing the system, and it would never show up in the national statistics. Thus, the anecdotal evidence of provider misuse may be true, despite an overall lack of effect of PPS. This is not to say that anecdotes are invalid measures of quality. To the contrary, it is precisely those few cases in which the health care system fails that need to be examined and corrections made. The PROs are designed especially for this function. It is their mandate to monitor the quality of care at the individual provider level and take appropriate action when quality problems arise.

Disabled and ESRD Enrollees Introduction

The Social Security Amendments of 1972 extended Medicare coverage to disabled persons under age 65 receiving Social Security or Railroad Retirement benefits because of disability. To qualify for disability payments, a worker must first meet insured status requirements relating to the necessary quarters of

employee contributions to the Disability Trust Fund. Second, they must meet the Social Security definition of disability: the inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or last for a continuous period of not less than 12 months. In addition to disabled workers, the disability program covers disabled dependents who are adults (age 18 or over) who were disabled in childhood and disabled widows or widowers who are 50 years of age or over. Medicare coverage for disabled persons begins only after the disabled person has received cash benefits for 24 months. Currently there are about 2.7 million disabled persons covered by Medicare.

Persons suffering from ESRD also became entitled to Medicare benefits with the enactment of the Social Security Amendments of 1972. Currently there are almost 100,000 persons covered by Medicare classified as ESRD. This includes: (a) 80,000 persons receiving maintenance dialysis treatments, (b) 6,000 persons receiving kidney transplants, and (c) 14,000 persons with functioning kidney grafts. The majority of patients (about 80,000) are on maintenance dialysis and this chapter will focus on them.

Disabled Population Trends

In 1973, there were 1,731,000 persons entitled to Medicare benefits due to disability. By 1981, the number of persons had increased to 2,999,000, for an average annual increase of 7.1 percent (Annual Medicare Program Statistics; 1981). The relatively high increase in the Medicare disabled population reflects

the accelerated growth of the Social Security cash disability program during the late 1960's and early 1970's. Beginning in the mid-1970's, the disability program in Social Security has been more tightly administered resulting in a much lower growth rate. Since 1981, there has been a gradual decline in the disabled population.

Table 4-15 shows the disabled population for the U.S. and for PPS and waiver States for the years 1980 through 1984. Overall, the number of disabled enrollees fell from 2,815,000 in 1980 to 2,710,000 in 1984. The disabled population in PPS States declined from 2,414,000 in 1981 to 2,339,000 in 1983 for an average annual rate of -1.6 percent. In waiver States, the population decline was somewhat greater at -2.1 percent (427,000 in 1981 and 409,000 in 1983). The disabled population continued to decline in 1984 in both groups of States.

Table 4-16 shows the change in the disabled population in PPS States by sex and age categories. The decline in the number of female disabled beneficiaries has been somewhat greater than for male disabled beneficiaries. From 1981 to 1984, the number of disabled persons aged 45 to 54 and aged 55 to 64 declined by 13 percent and 6 percent, respectively, while the disabled population aged 0 to 44 actually increased by 9 percent. This difference may reflect a different mix of reasons for entitlement within the age groups. While almost all beneficiaries aged 45 and older became eligible due to work disabilities, about 38 percent of beneficiaries aged 0 to 44 qualify as adults disabled as children, with most of these persons being mentally retarded. The tighter administration of the disability program (referred to above) would thus have had a stronger effect on the 45 and older group.

Table 4-15

Number of disabled Medicare beneficiaries in PPS states and waiver states and percent change, U.S., 1980-1984

(numbers in thousands)

Year	U.S.	PPS States	Waiver States
1980	2,815	2,389	425
1981	2,841	2,414	427
1982	2,792	2,373	419
1983	2,748	2,339	409
1984 (FY)	2,710	2,309	401
Average annual percent change:			
1980-83	-1.6	-1.6	-2.1
1983-84	-1.9	-1.7	-2.8

SOURCE: Medicare Enrollment files, disabled beneficiaries. Counts are as of July 1, for each year. 1984 enrollment was estimated as of April 1, 1984. Counts exclude disabled persons with ESRD.

Table 4-16

Disabled Medicare beneficiaries in PPS states and percent change by age and sex, U.S., 1980-1984

Age and sex		Number of disabled beneficiaries (in thousands) Calendar year				Fiscal year	Average annual percent change:	
		1980	1981	1982	1983	1984	1980-83	1983-84
	Total	2,815	2,841	2,792	2,748	2,710	-1.6	-1.9
Age								
	0-44 years	683	707	701	714	743	0.5	5.4
	45-54 years	619	614	581	555	540	-4.9	-3.6
	55-64 years	1,513	1,520	1,510	1,478	1,427	-1.4	-4.6
Sex								
	Male	1,774	1,794	1,761	1,738	1,720	-1.6	-1.4
	Female	1,041	1,047	1,030	1,010	990	-1.8	-2.7

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Disabled Utilization Trends

Table 4-17 presents discharge rates, average length of stay and total days of care rates for disabled persons for PPS and waiver States by year. Discharge rates increased in both PPS and waiver States from 1980 through 1983 (2.4 percent per year and 1.9 percent per year, respectively). In 1984, there was a large drop in the discharge rate for disabled persons in PPS States (10.1 percent) and a smaller drop in the waiver States (3.4 percent). This is in contrast to the experience of the aged where the decline in PPS States in the discharge rate in 1984 was 3.5 percent and there was a small (1.0 percent) increase in waiver States.

The trend for length of stay for the disabled was similar to that of the aged. Prior to PPS, lengths of stay were declining at a modest 1.0 percent per year in both PPS and waiver States. In 1984, length of stay declined by 12.4 percent in PPS States (from 9.0 to 8.1 days) and 5.0 percent in waiver States (11.5 days to 11.1 days). For the aged, the average length of stay declines were 13.2 percent in PPS States and 5.7 percent in waiver States.

Because of the large decrease in the discharge rate, the decline in total days of care was greater for the disabled than it was for the aged population. Total days per 1,000 declined in PPS States from 4,007 in 1983 to 3,349, a drop of 21.3 percent. In waiver States, the decline was less than one-half as great at 8.2 percent (from 4,316 in 1983 to 4,047 in 1984).

Table 4-17

Discharges per 1,000, average length of stay and total days of care per 1,000 for disabled Medicare beneficiaries in the U.S., PPS states and waiver states, 1980-1984

Year	Discharges per 1,000			Average length of stay			Days of care per 1,000		
	U.S.	PPS States	Waiver States	U.S.	PPS States	Waiver States	U.S.	PPS States	Waiver States
1980	408	417	355	9.6	9.2	11.9	3,904	3,853	4,208
1981	408	418	349	9.5	9.2	11.6	3,874	3,846	4,046
1982	433	443	377	9.5	9.1	11.6	4,095	4,048	4,366
1983	437	447	375	9.3	9.0	11.5	4,052	4,007	4,316
1984 (FY)	406	413	365	8.5	8.1	11.1	3,456	3,349	4,047
Average annual percent change:									
1980-83	2.3	2.4	1.9	-1.0	-1.0	-1.0	1.2	1.3	0.8
1983-84	-9.3	-10.1	-3.4	-10.8	-12.4	-5.0	-19.1	-21.3	-8.2

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Table 4-18 shows the change in discharge rates for the disabled in PPS States by sex and age groupings. Males had a greater decline than did females from 1983 to 1984 (11.0 percent and 8.7 percent, respectively). There were large differences by age group. The age group 0 to 44 experienced an 18.3 percent decline in discharges per 1,000, from 336 per 1,000 in 1983 to 289 per 1,000 in 1984. The declines were much less for persons aged 45 to 54 (11.9 percent) and for persons aged 55 to 64 (5.5 percent). Part of this difference may be due to a changing patient mix. As shown in Table 4-16, the age group 0 to 44 experienced a 5.4 percent increase in enrollment. If these new enrollees represent a less severely disabled group than in 1983, then the overall need for care could have declined. However, an 18.3 percent decline in the rate of hospitalization is much greater then could be explained by a shift in case mix.

Table 4-19 shows the changes in length of stay in PPS States by age and sex. As with the aged population, decreases in lengths of stay were fairly consistent across all groups. Female beneficiaries experienced a larger decrease in length of stay in 1984 than did male beneficiaries (13.2 percent and 11.9 percent, respectively). The youngest group had a slightly higher rate of decline in length of stay (13.4 percent) than did the oldest group (12.1 percent).

Table 4-20 shows the decreases in total days of care per 1,000 disabled persons by age and sex. With the exception of persons aged 55 to 64, all groups had decreases of greater than 20 percent. The greatest decline was for persons aged 0 to 44 with a decrease of 29.2 percent (3,089 days per 1,000 in 1983 and 2,385 days per 1,000 in 1984).

Table 4-13

Discharges per 1,000 disabled Medicare beneficiaries
in PPS states by age and sex, 1980-1984

Age and sex	Discharges per 1,000 disabled beneficiaries Calendar year				Fiscal year	Average annual percent change:	
	1980	1981	1982	1983	1984	1980-83	1983-84
Total	417	418	443	447	413	2.4	-10.1
Age							
0-44 years	313	311	339	336	289	2.4	-13.3
45-54 years	427	435	464	474	431	3.5	-11.9
55-64 years	459	461	483	491	470	2.2	-5.5
Sex							
Male	386	390	411	416	381	2.5	-11.0
Female	472	468	498	503	470	2.2	-8.7

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Table 4-19

Average length of stay for disabled Medicare beneficiaries in PPS states by age and sex, U.S., 1980-1984

Age and sex	Average length of stay for disabled beneficiaries Calendar year 1980	1981	1982	1983	Fiscal year 1984	Average annual percent change: 1980-83	1983-84
Total	9.2	9.2	9.1	9.0	8.1	-1.0	-12.4
Age							
0-44 years	8.8	9.1	9.2	9.2	8.3	1.3	-13.4
45-54 years	8.9	8.8	8.9	8.7	7.9	-0.5	-12.5
55-64 years	9.4	9.4	9.2	9.0	8.1	-1.7	-12.1
Sex							
Male	8.9	8.9	8.9	8.7	7.9	-0.9	-11.9
Female	9.7	9.6	9.5	9.3	8.4	-1.2	-13.2

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

Table 4-20

Total days of care per 1,000 disabled Medicare beneficiaries in PPS states by age and sex
U.S., 1980-1984

Age and sex	Days of care per 1,000 disabled beneficiaries Calendar year 1980	1981	1982	1983	Fiscal year 1984	Average annual percent change: 1980-83	1983-84
Total	3,853	3,846	4,048	4,007	3,349	1.3	-21.3
Age							
0-44 years	2,772	2,841	3,115	3,089	2,385	3.7	-29.2
45-54 years	3,782	3,825	4,132	4,133	3,399	3.0	-22.9
55-64 years	4,337	4,319	4,447	4,401	3,830	0.5	-16.9
Sex							
Male	3,450	3,484	3,651	3,620	3,017	1.6	-21.6
Female	4,557	4,480	4,743	4,686	3,937	0.9	-20.7

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1984

The utilization rates for the disabled suggest a different pattern of PPS impact than for the aged population. In PPS States, the aged experienced a moderate decline in discharge rates of 3.5 percent, probably not enough to raise serious questions about access to care. In addition, there were not large differences in this decrease by age, sex, or race. However, the decline in discharge rates for the disabled was much more pronounced (10.1 percent). In addition, the rate of decline was three times as great for the youngest disabled beneficiaries (18.3 percent) than it was for the oldest group (5.5 percent).

Does this mean that PPS has induced an access problem for the disabled? It is very difficult to say. As mentioned earlier in the section for aged beneficiaries, there are no acceptable standards for appropriate levels of rates of hospitalization. Therefore, there is no apriori reason for believing that a decrease in rates necessarily represents an access problem. However, differential changes could be cause for concern. And that is what has occurred here. The disabled population, a high risk group, has experienced a decline in use rates that is dissimilar to the overall trend as shown by the aged population. This needs to be studied further to determine the nature of the declines and the possible quality of care implications. It is possible, for example, that the decline is partially due to increased use of rehabilitation facilities or long term care.

ESRD Population Trends

Table 4-21 shows the growth of the ESRD dialysis population from 1981 through 1984 by age group. The ESRD dialysis population grew from 63,604 in

Table 4-21

Number of end-stage renal disease (ESRD) dialysis patients and percent change by age group, U.S., 1981-1984

Age	Number of ESRD dialysis patients				Annual Compound Rate of Growth	
	1981	1982	1983	1984	1981-83	1983-84
Total	63,604	68,944	74,422	78,769	8.2	5.8
0-14 years	521	582	595	628	6.9	5.5
15-24 years	3,033	3,030	2,952	2,897	-1.3	-1.9
25-34 years	7,453	7,665	7,845	7,979	2.6	1.7
35-44 years	8,616	9,179	9,909	10,536	7.2	6.3
45-54 years	12,205	12,809	13,228	13,628	4.1	3.0
55-64 years	16,085	17,794	19,189	20,125	9.2	4.9
65+ years	15,691	17,885	20,704	22,976	14.9	11.0

SOURCE: HCFA, BDMS, OSDM, ESRD MMIS data: 1980 To 1984

1981 to 74,422 in 1983, an annual growth rate of 8.2 percent. In 1984, the population increased by 5.8 percent to 78,769. The increase is largely due to an increasing incidence of treated renal failure as treatment is being expanded to an older and sicker population (Eggers, et al., 1984). However, the rate of increase is slowing as evidenced by Table 4-21. This is because patients on dialysis experience an annual mortality rate of about 19 percent. Therefore, as the population grows, so do the number of deaths and the difference between the total deaths in a year and the number of new patients is narrowing.

A second reason for the slowing in the growth of the dialysis population is the increasing rate of kidney transplantation and the increased success rate of transplants. Between 1981 and 1984, the number of Medicare transplants performed per year increased from 4,421 to 6,029, an annual rate of increase of 10.9 percent (HCFA, ESRD Research Report: 1985, in press). In addition, kidney graft survival has improved greatly in recent years. In the period 1977 to 1980, cadaveric and live related donor transplants had 1 year graft survival rates of 56 percent and 74 percent, respectively (Krakauer, et al., 1983). In the 1982 to 1983 period, cadaveric and live related donor transplant 1 year graft survival had increased to 66 percent and 88 percent, respectively.

About two-thirds of transplants are performed on persons between the ages of 11 and 35 years of age. Therefore, the larger numbers of transplants combined with the increased effectiveness is having its greatest effect on these age groups. As shown in Table 4-21 the number of persons aged 15 to 24 on dialysis is actually declining, from 3,033 in 1981 to 2,897 in 1984. In addition,

the age group 25 to 34 is experiencing a very low growth rate, in comparison to the rest of the dialysis population.

The continued high growth rate of the aged ESRD population can be attributed to an increasing incidence of treated renal failure among persons over age 65. Between 1980 and 1984, the rate of treated renal failure for this age group increased by over 60 percent (unpublished HCFA data).

ESRD Utilization Trends

Inpatient utilization rates for the ESRD dialysis population are shown in Tables 4-22, 4-23, and 4-24. Because the ESRD population is so small, it was decided not to divide the analysis into PPS and waiver States. Instead rates are presented for the U.S. total only. Table 4-22 presents discharge rates per 1,000 population by age group. As shown, there has been little change in the overall discharge rate among this population, ranging from a low of 1,166 in 1982 to a high of 1,240 in 1984. Perhaps most significant is the fact that discharge rates rose in 1984, the first year of PPS. There seems to be some relationship between age and discharge rates with those aged 65 and over having 40 percent more discharges in 1984 than those ages 15 to 24. However, this relationship was not consistent across all years. As shown, the change in discharge rates from 1983 to 1984 is not consistent across age groups. The 12.2 percent increase among those aged 65 and over may be related to the much larger (and presumably sicker) number of patients being treated in this group. The 29 percent decrease among those aged 0 to 14 could be related to the small number of patients in this group and may be only a temporary fluctuation in overall rate.

Table 4-22

Discharges per 1,000 dialysis patients
and percent change by age group, U.S., 1981-1984

Age	Discharges per 1,000 dialysis patients				Annual Compound Rate of Growth	
	1981	1982	1983	1984	1981-83	1983-84
Total	1,221	1,166	1,206	1,240	-0.6	2.9
0-14 years	1,392	1,533	1,523	1,081	4.6	-29.0
15-24 years	1,075	1,096	1,069	1,010	-0.2	-5.6
25-34 years	1,062	1,109	1,085	1,062	1.1	-2.2
35-44 years	1,105	1,117	1,117	1,118	0.5	0.2
45-54 years	1,158	1,137	1,197	1,143	1.7	-4.5
55-64 years	1,276	1,262	1,264	1,285	-0.5	1.7
65+ years	1,376	1,139	1,256	1,410	-4.5	12.2

SOURCE: HCFA, BDMS, OSDM, ESRD MMIS data: 1980 To 1984

Table 4-23

Average length of stay for dialysis patients
and percent change by age group, U.S., 1981-1984

Age	Average length of stay for dialysis patients				Annual Compound Rate of Growth	
	1981	1982	1983	1984	1981-83	1983-84
Total	10.3	10.1	10.0	8.8	-1.4	-11.5
0-14 years	9.6	9.5	9.4	8.5	-0.7	-10.0
15-24 years	9.2	8.7	8.4	7.3	-4.3	-13.3
25-34 years	9.6	9.0	8.8	7.8	-4.4	-11.2
35-44 years	9.9	9.6	9.2	8.1	-3.4	-11.7
45-54 years	9.8	9.7	9.5	8.3	-1.1	-13.0
55-64 years	10.3	10.4	10.1	8.9	-0.7	-12.2
65+ years	11.2	10.8	11.1	9.7	-0.7	-12.0

SOURCE: HCFA, BDMS, OSDM, ESRD MMIS data: 1980 To 1984

Table 4-24

Total days of care per 1,000 dialysis patients
and percent change by age group, U.S., 1981-1984

Age	Days of care for dialysis patients 1981	1982	1983	1984	Annual Compound Rate of Growth 1981-83	1983-84
Total	12,559	11,723	12,050	10,969	-2.0	-9.0
0-14 years	13,294	14,570	14,345	9,170	3.9	-36.1
15-24 years	9,864	9,484	8,998	7,365	-4.5	-18.2
25-34 years	10,214	9,963	9,541	8,287	-3.3	-13.1
35-44 years	10,929	10,737	10,307	9,113	-2.9	-11.6
45-54 years	11,291	11,056	11,408	9,476	0.5	-16.9
55-64 years	13,139	13,134	12,825	11,449	-1.2	-10.7
65+ years	15,456	12,343	13,895	13,721	-5.2	-1.3

SOURCE: HCFA, BDMS, OSDM, ESRD MMIS data: 1980 To 1984

Length of stay patterns among the ESRD population mirrored that found among both the aged and disabled populations (Table 4-23). Lengths of stay were decreasing at a moderate rate (1.4 percent per year) from 1981 to 1983. Between 1983 and 1984, however, lengths of stay decreased by 11.5 percent, from an average of 10.0 days to 8.8 days. This was consistent across all age groups.

Total days of care rates are presented in Table 4-24. Total days per 1,000 did not change greatly from 1981 to 1983 with rates in the 12,000 range in all years. However, due to the large decline in average length of stay there was a 9.0 percent decline in total days of care between 1983 and 1984. This is in contrast to the experience of the aged in which a decline nationwide of 11.5 percent in the average length of stay was compounded by a 2.9 percent decline in the discharge rate for a net decline of 14.1 percent.

In summary, utilization rates for the ESRD dialysis population showed a pattern somewhat different from that observed in the aged and disabled populations. Both the aged and the disabled experienced declines in discharge rates during the first year of PPS. The ESRD dialysis population experienced an increase in discharge rates. Because the ESRD population requires dialysis treatments during their stays, it represents a potentially more expensive population to the hospital and one that may have access problems. But the data show that its access, as measured by the discharge rate was better, in relation to the aged and disabled, than it was before PPS.

With regard to average length of stay, the ESRD dialysis population experienced declines which were very comparable to that experienced by the aged and disabled populations. There is no evidence that hospitals are differentially decreasing lengths of stay for any Medicare population group.

The next sections of this chapter deal with the possible effects of PPS on mortality rates of Medicare beneficiaries. One section discusses some issues in interpreting mortality rates as indicators of changes in the quality of hospital care. Then, a section examines the effect PPS may have had on overall, population-based rates of mortality in the Medicare population. Another section examines the possible effect of PPS on case-based measures of mortality.

Issues in Evaluating Mortality Rates

Among health status outcome measures, mortality rates are among the most commonly used indicators of quality because statistics for these rates are generally available and because of the obvious implications mortality has for beneficiary well-being. Mortality rates are intuitively appealing because better quality of care should lead to lower mortality, while poorer quality of care should lead to higher mortality. Furthermore, they are easily measured because death is an objective measure.

However, interpreting mortality rates is not the straightforward task it might appear to be. First of all, death is the most extreme outcome that one can relate to the provision of health care. To the extent that changes in mortality rates can be attributed to changes in the practice of medicine, then indeed there are quality

of care implications. However, poor quality of care could result in increased disability, discomfort, or hardship without having a measurable effect on mortality. Thus, the absence of a measurable change in mortality does not necessarily mean that there has been no change in the quality of care. In a sense, testing for changes in mortality represent a "worst case" scenario. If one finds increases in mortality that appear to be related to the introduction of PPS, then there is likely to be a severe quality of care problem. No change in mortality does not necessarily mean that quality has not changed, however.

A second problem with using mortality rates to test for changes in the quality of care due to PPS is the issue of attribution. There are many other factors which will have an impact on mortality independent of the effectiveness of medical care. These include general standards of living and personal health practices, as well as periodic events such as influenza epidemics. During the entire twentieth century, mortality rates have fallen. This has been due not only to improvements in health care but improvements in standards of living and advances in public health measures (water purification, better sanitation, vaccines, etc.). Currently, PPS seems to be the most important event occurring in the U.S. health care system. However, there are other societal changes over which the health care system has little or no control. One such example is lung cancer among women. In 1985, deaths of women due to lung cancer exceeded deaths due to breast cancer for the first time since recordkeeping began. This was due in large part to the increase in smoking among women which began back in the 1950's. Even if the rate of smoking among women were to decrease immediately, the lagged effects of a 30-year increase in smoking would push up lung cancer deaths among women for the next

couple of decades. The health care system probably has little effect on this type of mortality.

Four types of mortality measures are discussed below:

Population mortality is the basic measure. This is usually expressed as deaths per 100,000 population. It is a measure of total deaths, irrespective of place of death or hospitalization experience. An advantage of this measure is that it is based on the total population at risk and is not affected by variations in utilization rates or practice patterns which can affect hospital mortality irrespective of levels of quality. It also has the advantage of picking up any effect PPS might have on those persons not admitted to hospitals. On the other hand, it has the disadvantage of including mortality unrelated to the provision of health care. One has to be very careful when using population-based mortality not to attribute effects to the health care system which may be due to other societal trends (e.g., epidemiological variations such as influenza epidemics). Rates of both population based and post-admission mortality are analyzed in this chapter.

Discharge mortality is measured by the percent of admissions for which the patient is discharged dead. In 1984, the overall discharge mortality rate among aged Medicare beneficiaries was an estimated 5.9 percent.

It would seem that the discharge mortality rate is a potentially good measure of the quality of care delivered in a hospital. After all, it is during the stay that the hospital and attending staff have the patient under their care and, of course, the aim of the hospitalization is to produce a live and healthy patient. Given that

a certain number of patients are terminally ill and will die regardless of treatment, "quality" could then be measured as the extent to which a hospital's discharge mortality deviates from some overall average, or the extent to which a hospital's discharge mortality improves (or declines) over time.

However, a serious problem with using discharge mortality is that the period of observation is somewhat arbitrary. Suppose one were to develop a measure of life expectancy based on the percent of persons living to a given age. One would not compare the percent of males who live to be 50 years of age with the percent of females who live to be 60 years of age. However, this is exactly what happens when one compares discharge mortality rates across regions. New York has an average Medicare length of stay of about 13.8 days. The length of stay in California is about 7.7 days, 6.1 days shorter. Is it valid to compare discharge mortality rates between these two States given that the rates are based on very different time frames. Mortality can only increase with time. If California has a lower discharge mortality rate than New York, at least some of the difference will be accounted for in the 6.1 days following discharge in California. This problem is exacerbated if there is some characteristic of an area which causes lengths of stay to be higher or lower than they would average such as a shortage (or surplus) of SNF beds. It could be that in some areas the practice patterns are to discharge terminally ill patients to SNFs whereas, in other areas, the lack of available SNF beds results in many terminally ill patients remaining in the hospital, thus driving up both the average length of stay and the discharge mortality rate.

There is some evidence that variations in length of stay do explain some of the regional differences in discharge mortality. Table 4-25 compares discharge

Table 4-25

Discharge mortality and 30-day post admission mortality for aged Medicare beneficiaries for selected states, 1984

Geographic location	Number of discharges	Discharge mortality rate	30-day Post-admission mortality rate	Absolute difference
U.S. Total	530,423	5.9	7.5	1.6
California	44,630	5.7	7.6	1.9
Oregon	5,995	4.9	8.4	3.5
New Jersey	15,837	7.6	7.7	0.1
New York	37,973	8.6	7.8	-0.8

mortality rates and the mortality rate from the time of admission until 30 days post-admission for a few selected States in 1984. For the U.S., discharge mortality in 1984 was 5.9 percent and within 30 days from date of admission mortality was 7.5 percent. In other words, about 1.6 percent of patients die following the discharge but within 30 days of the admission. This varies greatly by State. Oregon has one of the lowest discharge mortality rates in the country at 4.9 percent (it ranks 43rd among the 50 States and the District of Columbia). However, at 30 days after admission, Oregon has the highest mortality rate in the country at 8.4 percent. At the other end of the spectrum is New Jersey which has a discharge mortality rate of 7.6 percent which is 2.1 percent over the national average. However, at 30 days, New Jersey's mortality rate is 7.8 percent, or only 0.3 percent over the national average.

New York presents an interesting aspect of the discharge mortality rate. The discharge mortality rate is 8.6 percent and the 30 day mortality rate is actually lower at 7.8 percent. Yet the average length of stay in New York is only 13.8 days. How can this be? This results from the fact that the number of inhospital deaths after 30 days exceeds the number of deaths occurring after discharge but before 30 days. Table 4-26 shows the distribution of lengths of stay and discharge mortality rates by length of stay for the U.S. and New York for 1984. Nationwide, stays of greater than 30 days account for 2.6 percent of all discharges. In New York the figure is 8.9 percent. Further, the discharge mortality rate nationwide for these long stays is 15.3 percent whereas in New York it is 22.3 percent. The result of more long stays and higher mortality for those long stays is that these long stays in New York account for 23 percent of all inhospital deaths in New York as compared to 7 percent in the rest of the country.

Table 4-26

Percent distribution of stays and in-hospital deaths with associated mortality rates by average length of stay, U.S. and New York, 1984

Average length of stay	United States			New York		
	Percent of stays	Percent of deaths	Discharge mortality rate	Percent of stays	Percent of deaths	Discharge mortality rate
Total	100.0	100.0		100.0	100.0	
0-5 days	45.0	46.1	5.9	35.3	31.0	7.6
6-10 days	29.5	19.8	3.9	25.6	16.1	5.4
11-15 days	13.0	11.7	5.2	14.6	10.5	6.2
16-20 days	5.6	7.6	7.8	8.2	8.1	8.6
21-30 days	4.3	7.8	10.5	7.4	11.3	13.1
31 + days	2.6	7.0	15.3	8.9	23.0	22.3

A more epidemiologically sound alternative to discharge mortality is mortality at fixed intervals from admission. This avoids biases due to regional patterns of length of stay and possible constraints on the placement of patients to alternative settings due to variations in the supply of SNF, ICF, or home health care.

One limitation to post-admission mortality rate is that it is affected by changes in casemix. Table 4-27 presents hypothetical examples of changes that could take place within a hospital or group of hospitals that would affect post-admission mortality rate without necessarily reflecting on the quality of care delivered. The baseline figure shows 5,000 deaths within 30 days of admission per 100,000 admissions or a post-admission mortality rate of 50 per 1,000 admissions. The first example shows what would happen if hospitals (or PROs) reduced unnecessary admissions by 5 percent. Presumably, the unnecessary admissions would have a mortality rate close to zero. Therefore, the 5 percent reduction in admissions comes out of the denominator only (total admissions). The result is the contrary finding that a beneficial action (reduction in unnecessary admissions) leads to a worse performance in the outcome measure (the mortality rate rises from 50 percent to 53 per 1,000 admissions). As was shown earlier in the section on access and utilization, there has been a decline in admissions rates since the beginning of PPS. If this decline was largely due to unnecessary or less severe cases, then an increase in post-admission mortality should be expected.

The second hypothetical example shows what would happen to post-admission mortality if hospitals selectively admit "easy," or less severe cases and consistently avoid problematic cases which have higher mortality rates. In the example,

Table 4-27

Hypothetical Examples of the Impact of Changes in Admissions on Post-Admission Mortality Rates

Change in Admisssions	Number of Admissions	Deaths Within 30 Days of Admissions	Post Admission Deaths per 1,000 Admissions
Baseline	100,000	5,000	50
Example 1: Reduced admissions	95,000	5,000	53
Example 2: Increased admissions	105,000	5,000	48

hospitals increase overall admissions by 5 percent but do not incur any more deaths because the extra cases are less severe than the average group of admissions. Once again the net result is odd, but in the opposite direction. An undesirable action leads to a decline in post-admission mortality from 50 percent to 48 per 1,000 admissions.

To counteract the limitations in the post-admission mortality rate per 1,000 discharges, this chapter uses another measure of mortality which is a hybrid of the population based and the post admission death rates. It is the number of post admission deaths per 1,000 population. The numerator is the number of deaths occurring within a fixed length of time from admission and the denominator is the total population, not just the hospitalized population. The advantage of this measure is that it helps control for changes in casemix. As will be shown, this measure shows a different pattern than does the post admission rate based on hospitalized patients only.

Population-Based Mortality

This section presents the findings of the impact of PPS on population-based mortality for the Medicare aged, disabled, and ESRD populations. It compares pre-PPS trends in mortality with the change in mortality from 1983 to 1984.

Aged Population

This section focuses on the overall mortality of the U.S. aged population (persons aged 65 and over). The data are taken from vital statistics reports from NCHS and include data on all persons age 65 and over. Detailed data on age specific mortality within States were not available to allow a comparison of the experience of PPS and waiver States.

It is unlikely that any positive or negative effects of PPS on overall population mortality would be great enough to be measured. Nevertheless, it is important to examine the trends in mortality that have occurred over the past two decades and compare these trends with mortality rates that occur after the beginning of PPS. The establishment of a baseline and the continued monitoring of mortality statistics are an important source of information to policymakers, to help in assessing whether budget cuts have any cumulative effect on trends in mortality.

NCHS publishes annual statistics on mortality rates by age for the U.S. (Annual Summary of Births, Marriages, Divorces, and Deaths: United States). Table 4-28 presents these data for the years 1968 through 1984 for the age groups 65 to 74, 75 to 84, and 85 and over. Mortality rates increase substantially with age. In 1984 persons aged 75 to 84 had an annual mortality rate about 2.2 times as great as for persons aged 65 to 74 (6,417 and 2,864 per 100,000, respectively). Persons aged 85 and over had an annual mortality rate (14,890 per 100,000) about 5.2 times as great as persons aged 65 to 74. From 1968 to 1983, there was a significant improvement in the mortality rates for all aged persons. In each of the three age groups, there was a total decline in mortality of about 22 to 24 percent. This amounts to an average annual rate of decline of about 1.7 percent per year.

The rate of decline in mortality has not been uniform. Rather, there is considerable year to year fluctuation in mortality rates. For instance, for persons aged 65 to 74 there were 13 years in which the mortality rate declined and 2 years in which it increased. The percent change from 1 year to the next ranged from a 2.2 percent increase in 1980 to a 4.2 percent decrease which occurred in 1975. For the other two age groups, the year to year fluctuations were even greater. For persons aged 85 and over, mortality rates increased in 6 of the 15 years. In 1969 there was a reported 13.2 percent decline in mortality followed by a 7.5 percent increase in 1970.

Table 4-23

Deaths per 100,000 population by age group and annual percent change, U.S. 1968-1984

Year	Age 65-74 years Rate per 100,000 pop.	Percent Change	Age 75-84 years Rate per 100,000 pop.	Percent Change	Age 85+ years Rate per 100,000 pop.	Percent Change
1968	3,724		8,294		19,583	
1969	3,633	-2.5	8,098	-2.4	18,822	-3.9
1970	3,583	-1.4	8,004	-1.1	16,345	-13.2
1971	3,483	-2.8	7,774	-2.9	17,567	7.5
1972	3,521	1.1	7,805	0.4	17,543	-0.1
1973	3,432	-2.5	7,709	-1.2	17,679	0.8
1974	3,319	-3.3	7,377	-4.3	16,901	-4.4
1975	3,180	-4.2	7,035	-4.6	15,655	-7.4
1976	3,118	-1.9	6,952	-1.2	16,059	2.6
1977	3,044	-2.4	6,756	-2.8	15,369	-4.3
1978	3,016	-0.9	6,710	-0.7	15,480	0.7
1979	2,929	-2.9	6,497	-3.2	14,962	-3.3
1980	2,995	2.2	6,693	3.0	15,980	6.8
1981	2,922	-2.4	6,430	-3.9	15,380	-3.8
1982	2,885	-1.3	6,330	-1.6	15,048	-2.2
1983	2,883	-0.1	6,310	-0.3	15,422	2.5
1984	2,864	-0.7	6,417	1.7	14,890	-3.5

SOURCE: National Center for Health Statistics: Annual Summary of Births, Marriages, Diviorces, and Deaths: United States

The year to year fluctuations described above illustrate the difficulty in interpreting the observed mortality rate for 1984. The method used in this paper is to calculate an expected mortality rate for 1984 based on the trends that occurred between 1968 and 1983. By comparing the actual mortality rate to the expected rate, we can determine the extent to which the observed rate is higher or lower than expected. Because so many factors influence mortality rates it would be inappropriate to assume that the observed differences between the actual and expected values were caused by PPS, especially with only 1 year of PPS experience. As experience with PPS progresses and as the results of other quality of care studies become available, perhaps more definitive conclusions may be possible.

Clearly, the overall trend in mortality rates over the past 15 years has been down. Therefore, all things being equal, one would expect mortality to have declined in 1984 as well. Another factor affecting mortality among the aged is the gradual aging of persons in this age group. In 1968, 63 percent of the Medicare population were aged 65 to 74 and 6 percent were aged 85 and over. By 1984, the 65 to 74 group had decreased to 58 percent, and the 85 and over had increased to 10 percent. This gradual aging of the Medicare population will temper the decrease in the overall mortality rate. Table 4-29 shows the NCHS mortality rates age adjusted to the Medicare age distribution in 1980.

Overall age-adjusted mortality for the aged decreased from 6,637 per 100,000 in 1968 to 5,130 per 100,000 in 1983, an average annual decrease of 1.7 percent. However, not only were there considerable year-to-year fluctuations (there were 3 years in which mortality increased, including 1983), but the decline

Table 4-29

Deaths per 100,000 population for all aged person and annual percent change, U.S., 1968-1984

Year	Rate per 100,000 aged population	Percent change
1968	6,637	
1969	6,449	-2.8
1970	6,152	-4.6
1971	6,141	-0.2
1972	6,171	0.5
1973	6,101	-1.1
1974	5,857	-4.0
1975	5,550	-5.2
1976	5,527	-0.4
1977	5,357	-3.1
1978	5,336	-0.4
1979	5,170	-3.1
1980	5,367	3.8
1981	5,186	-3.4
1982	5,101	-1.6
1983	5,130	0.6
1984	5,100	-0.6

SOURCE: National Center for Health Statistics: Annual Summary of Births, Marriages, Diviorces, and Deaths: United States (Age adjusted to the 1980 aged distribution of aged Medicare Beneficiaries).

was distinctly slower in the second half of this time period than the first. From 1968 to 1983, the decreases were a more modest 1.1 percent. Estimating the expected rate for 1984 based on the 1968 to 1983 data is thus not a straightforward procedure. Based on the overall trend since 1968, one would expect a decrease of 1.7 percent. Based on the trend since 1976, one would expect a decrease of 1.1 percent. In addition, one should have some measure of the range of probable values based on the historical year to year variations.

The expected 1984 mortality rate for the U.S. aged population was calculated using a linear time trend model. The dependent variable (the year-by-year mortality) was expressed as a log function so that the trend would appear as a rate of change. The independent variable, time, was divided into two separate time trends (as described in Draper and Smith, p.139). The two trends intersect in 1976. Essentially this model allows one to use all 15 years of mortality data and at the same time provide estimates of two rates of change, one prior to 1976 and one since 1976. This allows full use of the data and allows for an apparent levelling of the downward trend in mortality.

Table 4-30 shows the results of this analysis. The regression model fits the data very well with an R-squared value of .96. The estimated rate of change coefficients for the 1968 to 1976 time period was -2.3 percent and for the 1976 to 1983 time period the coefficient was -1.2 percent. Thus, it is estimated that since 1976 mortality rates have been improving less rapidly than previously. Table 4-30 presents the actual mortality rates for each of the years 1968 through 1984 as well as the predicted rates from the model and an estimated confidence interval of plus and minus 2 standard deviations from the predicted rate. If an

Table 4-30

Estimated and actual mortality rates per 100,000- aged population, U.S., 1968-1984

Year	Actual mortality rate/100,000	Low estimate (-2 std.div.)	Predicted mortality rate/100,000	High estimate (+2 std.div.)
1968	6,637	6,385	6,625	6,873
1969	6,449	6,239	6,473	6,715
1970	6,152	6,095	6,324	6,561
1971	6,141	5,955	6,179	6,411
1972	6,171	5,819	6,037	6,263
1973	6,101	5,685	5,898	6,120
1974	5,857	5,555	5,763	5,979
1975	5,550	5,427	5,631	5,842
1976	5,527	5,303	5,502	5,708
1977	5,357	5,242	5,439	5,643
1978	5,336	5,182	5,376	5,578
1979	5,170	5,123	5,315	5,514
1980	5,367	5,064	5,254	5,451
1981	5,186	5,006	5,194	5,389
1982	5,101	4,949	5,134	5,327
1983	5,130	4,892	5,076	5,266
1984	5,100	4,836	5,017	5,206

SOURCE: National Center for Health Statistics: Annual Summary of Births, Marriages, Divorces, and Deaths: United States (Age adjusted to the 1980 aged distribution of aged Beneficiaries).

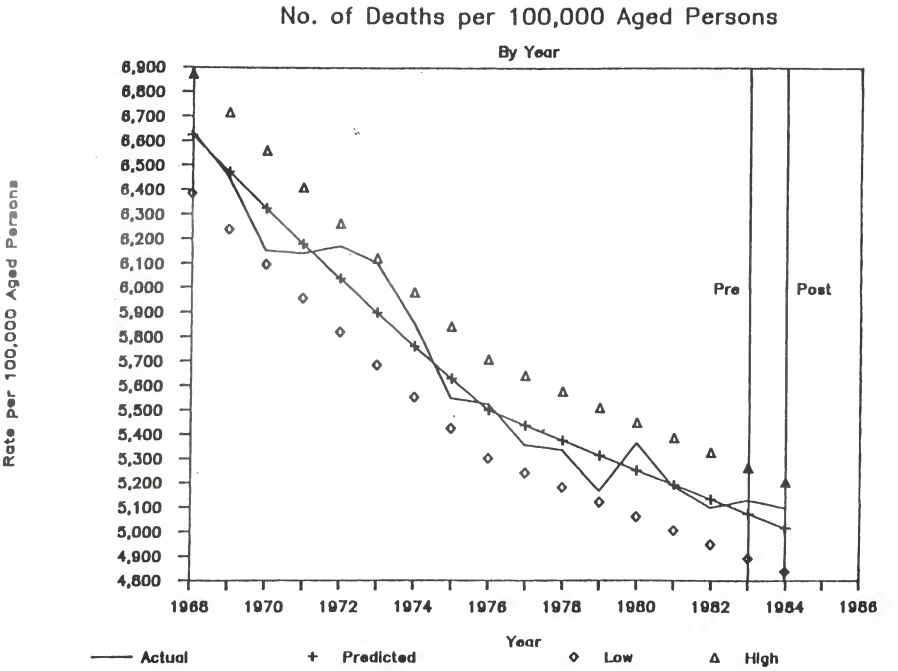
actual value lies outside of the confidence intervals, then one would be 95 percent certain that that value was off the trend line. These data are displayed in graphic format in Figure 4.2 as well.

Figure 4.2 indicates that the decline in mortality during the period 1968-1984 has been quite steady. A few years (most notably 1980) exhibited increases in mortality. The most substantial declines in mortality occurred in the first half of the time period after which mortality continued to decrease, but more gradually. For this reason, two different slopes were estimated for the regression line in Figure 4.2; the first for the time period 1968-1976, and the second for the period 1976-1984.

In 1984, the predicted mortality rate for aged persons was 5,017 deaths per 100,000. The actual rate was 5,100, or 1.7 percent higher than predicted by the model. However, as shown by the confidence intervals in Figure 4.2, the 5,100 was clearly within the bounds of year-to-year variations experienced in previous years. The upper end of the 95 percent confidence interval in 1984 was 5,206. Thus, the actual mortality rate was not statistically different from the previous trend of declining mortality.

The difficulty in projecting expected mortality rates can be further illustrated using the data in Table 4-29. Looking over an even shorter time frame (1979 through 1983), it appears that mortality rates may have almost stopped declining. From 1979 through 1983, there was only a .2 percent average decline in mortality. The model was rerun using 1979 as the year in which a change took place in the long term trend in mortality. The model fit very well (R squared was

FIGURE 4.2


No. of Deaths per 100,000 Aged Persons
By Year
Rate per 100,000 Aged Persons
6,900
6,800
6,700
6,600
6,500
6,400
6,300
6,200
6,100
6,000
5,900
5,800
5,700
5,600
5,500
5,400
5,300
5,200
5,100
5,000
4,900
4,800
Pre
Post
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
Year
Actual
Predicted
Low
High

.96) and the predicted mortality in 1984 was 5,114, somewhat higher than what actually occurred.

The major point to be made from these various examinations of the data is that the mortality rate in 1984 was well within historical trends for mortality among the aged. Tracking mortality in future years against a projected rate will become more and more suspect, however. As the projected figures get farther and farther away from 1983, the accuracy of the projection declines. For instance, how would one interpret the mortality rates if they continue to exhibit the rate of change shown between 1979 and 1983? Was the 1979 to 1983 trend a "real" leveling off of the historical trend or was it a short term aberration in the longer trend which goes back at least to 1968? There is no simple answer to this question. In essence, the assessment of the PPS impact on population mortality rates will have to be taken within the context of other measures of quality, such as case-specific mortality and rehospitaliztion rates.

Disabled Enrollees

This section examines trends in mortality rates for Medicare's disabled enrollees from 1980-1983 and compares them to the change from 1983 to 1984. Trends in the PPS and waiver States are also compared.

Methods and Data

A 1-percent sample of disabled beneficiaries (approximately 33,000) entitled on January 1 was selected for each of the years 1980-1984, using

Medicare's HISKEW file. Mortality rates for each year were computed for 6 month and 12 month intervals using life table estimates. Six and 12-month mortality rates were computed separately for adults disabled as children (ADC) one-half of whom are mentally retarded, and for all other disabled persons, using two age groups for non-ADC entitlees (less than 55 and 55-64). Adjusted rates were then computed to reflect the distribution by age and ADC status of disabled enrollees in 1984. Adjustments were made for ADC status because ADC enrollees often do not use as many covered services as other disabled enrollees. The percentage of ADC enrollees among the disabled has increased in recent years due to a decline in the number of disabled workers.

Mortality Trends

In the PPS States the adjusted probability of death within 12 months decreased in 1984 from 3.0 percent to 2.9 percent; although the decline was not statistically significant (Table 4-31 and Figure 4.3). This was preceded by a small decrease in mortality in 1981, no change in 1982, and an increase in 1983 (from 2.8 to 3.0 percent). The waiver States exhibited more fluctuation in mortality rates, probably because of their smaller sample size. The trend was similar to that for the PPS States, i.e., a decrease in mortality in 1981, followed by little change in 1982, an increase in 1983, and a decrease in 1984. The 21.1 percent decline in mortality in the waiver States was quite large from 1983 to 1984 and reached statistical significance at the .05 level.

It is difficult to explain why mortality decreased so much in the waiver States. Part of the answer probably lies with the relatively small sample size

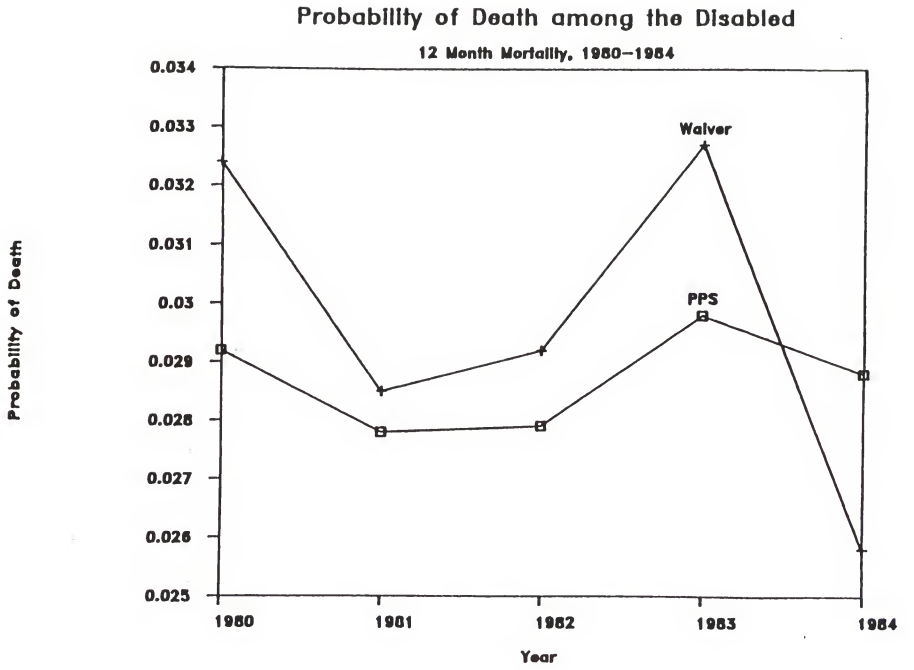
Table 4-31

Probability of death among the disabled population and percent change among PPS states and waiver states, U.S., 1980-1984

Year	PPS states 12-month mortality	Waiver states 12-month mortality
1980	0.029	0.032
1981	0.028	0.029
1982	0.028	0.029
1983	0.030	0.033
1984	0.029	0.026
Average annual percent change:		
1980-83	0.7	0.3
1983-84	-3.4	-21.1

Adjusted to the age and ADC distribution of the 1984 Medicare disabled population by the direct method

FIGURE 4.3


Probability of Death among the Disabled
12 Month Mortality, 1980–1984
Probability of Death
0.034
0.033
0.032
0.031
0.03
0.029
0.028
0.027
0.026
0.025
Waiver
PPS
1980
1981
1982
1983
1984
Year

available for the waiver States. Although approximately 4,800 observations were available in the waiver States each year, the death rate is quite low and from year to year, rates can be rather unstable. Although mortality is estimated to have declined in the waiver States by 21 percent in 1984, this decline barely achieved statistical significance ($p = .04$). It should also be noted that the 1984 decline in mortality in the waiver States was preceded by a large increase in 1983. The 1984 level of mortality is not too different from mortality levels existing before 1983 in these States.

Recent changes in the disability program may have produced aberrant trends in the average level of health of the disabled. Many beneficiaries were taken off the disability rolls in the early 1980's, and some have since been reinstated. The removal of a large number of the "least sick" beneficiaries from the disability rolls in 1980-1982 could have artificially increased the rate of mortality in 1983. If disability reviews were more stringent in some States than others, this could also have produced differential effects on overall mortality by State.

At this point, it is not clear what the long term trend in mortality among the disabled will be. Mortality rates will be closely monitored and analyzed in greater depth as more post-PPS years of data become available.

Medicare ESRD Population

This section describes recent trends in the survival rate of patients on renal dialysis. The analysis covers the period from January 1, 1980 through December 31,

1984 and includes all Medicare enrollees with end-stage renal disease (ESRD) who had entitlement during this time.

Background

There were a number of changes occurring in or otherwise affecting the ESRD program that operated simultaneously over the observation period. These include: (a)/an increasing incidence rate (rate of new persons on dialysis), (b) an apparent increase in severity, as indicated by the age distribution of ESRD patients and the percent of ESRD patients with diabetes, (c) an increasing percentage of patients on continuous ambulatory peritoneal dialysis (CAPD), (d) increasing rates of kidney transplantation, (e) the increasing practice of reusing dialysis filter elements, (f) the introduction of the composite rate payment for dialysis, and (g) the introduction of the Medicare PPS for reimbursing hospitals.

Items (a) and (b) are indicators of changes in patient case mix. The analysis presented below attempts to control for these changes. However, it is certainly possible that there are changes in severity that are unmeasured which could impact on mortality levels. Substantial clinical information, in addition to primary cause of renal failure, would be needed to adequately control for severity levels.

Items (c), (d) and (e) are changes that have been taking place in practice patterns. CAPD is the fastest growing type of dialysis therapy. There is no evidence that CAPD has been associated with higher mortality rates. However, CAPD patients could not be distinguished from hemodialysis patients in this

analysis. Kidney transplantation rates could affect dialysis mortality if the recipients of kidney transplantation were healthier than other dialysis patients. The effect of transplantation would then be to increase patient severity among the remaining dialysis patients by removing more of the healthier patients. Although there were substantial increases in transplantation in 1983 and 1984 (about 14 percent each year), there is no evidence that recipients of transplants are healthier than other renal failure patients. In addition, the life table method used in this analysis includes the survival experience of transplant patients for the period prior to transplantation.

The practice of reuse of dialysis filters has been increasing for a number of years. A recent study (Held, et al., 1987) found that improved patient survival rates were associated with dialysis facilities which have been long-term reusers of dialysis filters. Each year the Center for Disease Control, with the cooperation of the Health Care Financing Administration, conducts a surveillance of dialyzer reuse and its effect on rates of hepatitis. To date, no relationship has been found.

Items (f) and (g) are payment mechanisms implemented by the Health Care Financing Administration in 1983. The composite rate for dialysis is a payment based on the weighted average audited costs of providing: (a) facility hemodialysis and (b) home hemodialysis. To the extent that home dialysis is less expensive and is appropriate for a patient, it gives the dialysis facility the incentive to move patients to the home setting. Under the composite rate hospital-based and independent ESRD facilities are paid a weighted average of the cost of caring for facility-based and home-dialysis individuals. PPS was begun in October of 1983 and was phased in

according to individual hospital fiscal years during FY 1984. The ESRD composite rate was implemented in August of 1983, went into effect for all facilities simultaneously and relates to care that all dialysis patients receive each week, whereas prospective payment is only related to inpatient care.

The extent to which any or all of the above factors might contribute to dialysis patient mortality cannot be determined from this analysis. However, the analysis was structured to control for potential changes in patient case-mix, as discussed below.

Methods and Data

Computation of survival rates for dialysis patients requires a date of renal failure onset and a date of death. Dates of death were taken from enrollment records which are maintained for all Medicare beneficiaries. The determination of renal failure onset was defined as the date of first dialysis and was taken from the patient medical evidence record (HCFA-2728), the outpatient dialysis record (HCFA-1483), or from the entitlement records.

One-year survival rates were calculated using a standard actuarial modified life-table analysis. This method is used to calculate mortality rates from a given start date (such as date of renal failure) until death or end of the observation period (in this study, one year from the start date). It also accounts for the survival experience of persons who exit the study for any other reason such as kidney transplantation. In this way the survival experience of transplant recipients prior to transplant is included as part of the dialysis survival rate.

In preliminary analyses, patients were followed from the date of renal failure until (1) death (2) a kidney transplant, or (3) 365 days from the renal failure date, whichever came first. Each year's survival rate was based on patients initiating dialysis treatment during that year. The preliminary results suggested a potential shift in severity of illness among newly diagnosed patients. Table 4.32 shows the number of newly treated ESRD patients in the Medicare population by year. From 1980 through 1984 the number of newly treated patients increased from 18,392 to 25,859 -- a compounded annual rate of increase of 8.9 percent. This increase was not consistent across types of patients. For patients aged 65 to 74, the rate of increase was 11.7 percent per year. For patients aged 75 and over, the rate of increase was 20.7 percent. The large increase among persons over age 65 could be due to at least two factors. First, it is likely that dialysis therapy is being extended to a more severely ill group of elderly patients than in previous years. Second, there was a change in the use of the patient medical evidence form during this time period. Prior to 1982, the patient medical evidence record was effectively a voluntary form filled out by providers when renal failure occurred. Beginning in 1982 the form was made a mandatory condition of entitlement for persons whose entitlement was due to ESRD only. Compliance with this form subsequently increased. Although aged persons' entitlement does not depend on this form, it is possible that some of the increase in incidence among the aged is an artifact of better reporting. This could potentially bias the mortality results if the better reporting was among aged persons with higher death rates.

Preliminary analysis among newly treated Medicare patients suggest that such a trend may be occurring. Mortality rates among the aged increased with the increase

Table 4.32

ESRD Program Incidence, 1980-84

Characteristic	1980	1981	1982	1983	1984	Annual Percent Change
Total	18,392	19,263	21,733	24,659	25,859	8.9%
Age						
0 to 14 years	375	332	418	379	435	3.8%
15 to 24 years	1,082	1,109	1,165	1,094	1,150	1.5%
25 to 34 years	2,096	2,179	2,443	2,440	2,596	5.5%
35 to 44 years	2,230	2,367	2,587	2,814	2,987	7.6%
45 to 54 years	3,171	3,227	3,523	3,713	3,817	4.7%
55 to 64 years	4,318	4,691	5,238	5,679	6,143	9.2%
65 to 74 years	3,766	3,936	4,546	5,809	5,855	11.7%
75 + years	1,354	1,422	1,813	2,731	2,876	20.7%
Mean Age	52.6	52.9	53.3	55.3	55.1	1.2%
Sex						
Male	10,310	10,702	12,029	13,589	14,362	8.6%
Female	8,082	8,561	9,704	11,069	11,497	9.2%
Race						
White	12,510	13,233	14,972	16,603	17,507	8.8%
Black	4,789	4,930	5,798	6,887	7,158	10.6%
Other	637	682	817	1,003	1,082	14.2%
Unknown	456	418	146	166	112	-29.6%
Cause of Renal Failure						
Diabetes	2,212	3,599	4,957	5,823	6,868	32.7%
Glomerulonephritis	2,189	3,405	5,066	5,448	5,692	27.0%
Hypertension	2,427	3,892	5,334	5,661	6,211	26.5%
Other	3,424	4,342	4,555	4,843	4,973	9.8%
Unknown	8,140	4,025	1,820	2,884	2,114	-28.6%

SOURCE: ESRD Medical Information System, Health Care Financing Administration

in incidence. Therefore, the analysis was restructured to help control for this potential bias. The analyses presented below are based on dialysis patients alive as of January 1 of each year (not just newly treated patients). In addition, the analysis is limited to those patients who had survived at least one year prior to the January 1 start date. In this way, the effects of changes in severity among newly treated patients is diminished.

Mortality Trends

Table 4.33 presents the results of this survival analysis. In 1980 ESRD patient survival on dialysis was 86.0 percent. By 1984 this had decreased to 84.8 percent. However, the decline is due to a shift toward an older population. In 1980, persons aged 65 and over accounted for 22 percent of the dialysis population; by 1984 this had increased to 28 percent. Because older persons have much higher death rates, this shift in the age distribution tends to lower the aggregate survival rate. Therefore, the overall survival rate was age adjusted to the age distribution of the population in 1980. Table 4.33 also shows these age adjusted rates. Age adjusted survival rates varied from a low of 85.9 percent in 1981 to a high of 86.5 percent in 1982, with no discernible trend over the time period under observation.

The table shows other patient risk relationships as well. In each year, males had survival rates slightly lower than females. White persons consistently had lower survival rates than did either black persons or persons of other races. Persons whose reported cause of renal failure is glomerulonephritis had survival rates ranging

Table 4.33

Medicare ESRD dialysis patient survival by age, sex, race, cause of renal failure
1980-1984 *

Characteristic	1980 Survival Rate (percent)	1980 Number	1981 Survival Rate (percent)	1981 Number	1982 Survival Rate (percent)	1982 Number	1983 Survival Rate (percent)	1983 Number	1984 Survival Rate (percent)	1984 Number
Total	86.0	33,206	85.5	38,345	85.7	43,324	85.1	47,708	84.8	51,788
Age Adj Tot	86.0		85.9		86.5		86.3		86.3	
Age										
0-14 years	96.3	286	96.8	334	97.7	379	98.9	394	96.6	419
15-24 years	96.0	1,729	96.9	1,878	97.7	1,941	97.1	1,975	97.4	1,828
25-34 years	95.0	3,776	94.4	4,240	94.7	4,665	95.1	4,878	94.9	4,919
35-44 years	91.3	4,823	91.3	5,330	92.2	5,865	92.7	6,343	91.7	6,820
45-54 years	89.1	6,863	89.0	7,590	90.0	8,346	88.8	8,910	89.1	9,255
55-64 years	83.7	8,582	83.4	10,020	83.6	11,496	83.2	12,807	83.6	14,037
65-74 years	77.0	5,769	76.6	7,040	77.0	8,169	76.8	9,383	77.4	10,795
75+ years	67.0	1,378	68.1	1,913	68.1	2,463	69.6	3,018	68.9	3,715
Sex										
Male	85.5	18,173	84.8	20,835	85.2	23,402	84.7	25,544	84.6	27,455
Female	86.5	15,031	86.2	17,508	86.2	19,920	85.6	22,162	84.9	24,331
Race										
White	85.7	21,706	84.6	24,770	84.8	27,666	84.2	30,222	83.6	32,442
Black	86.5	9,680	86.9	11,400	87.3	13,113	86.5	14,617	86.4	16,265
Other	86.2	1,036	86.9	1,230	85.4	1,433	86.4	1,616	87.7	1,828
Cause of Renal Failure										
Diabetes	76.4	1,800	73.9	2,248	76.6	2,880	73.4	4,149	74.6	5,616
Glomerulonephritis	90.5	5,228	89.8	5,893	89.9	6,458	89.2	7,646	87.6	9,379
Hypertension	85.2	3,765	84.2	4,541	84.0	5,388	83.4	6,972	82.7	9,074
Other/Unknown	85.8	22,413	85.7	25,663	86.0	28,598	86.2	28,941	86.6	27,719

* Includes only persons who have survived for at least one year prior to January 1 of reference year

SOURCE: ESRD Medical Information System, Health Care Financing Administration

between 87.6 percent and 90.5 percent. Persons whose reported cause of renal failure was hypertension had survival rates between 82.7 and 85.2 percent. Persons whose renal failure was reported to be diabetes had the lowest survival rates, ranging between 73.4 and 76.6 percent. The downward trend in survival across sex, race and diagnosis groupings is due to the age effect discussed above. Sex, race and diagnostic group survival rates were not age adjusted.

The results of this analysis show a slightly decreasing overall crude survival rate for the ESRD population on dialysis. However, this decrease is accounted for by the aging of this population, which is due to rapidly increasing incidence rates among those persons aged 65 and over. There is some evidence that the more recently treated elderly represent a more severely ill population than in previous years. Whether this is due to an expansion of treatment to more severely ill persons, or is a data reporting artifact (or some combination of the two) cannot be determined from this analysis.

Post-Admission Mortality

Post-admission mortality was calculated on the basis of deaths that occurred within 6 weeks of admission to a hospital. This section analyzes trends in mortality rates and focuses on trends before and after the implementation of PPS. Statistics on deaths will be presented separately for PPS States and for the four States in which prospective payment was waived in 1984.

Methods and Data

A pre/post-research design was employed for this analysis. Changes in mortality patterns in the PPS States were compared to changes occurring in the 4 waiver States, which served as a comparison group. For the mortality analysis, data from each of the years 1980-1984 were examined; for the rehospitalization analysis, data for 1979-1984 were used.

The principal data source used was HCFA's MedPAR file, which was described previously in the "Hospital Utilization" section. This file was used for calendar years 1980-1983 and FY 1984.

The shortfall in the MedPAR records, which was described previously, may have affected some of the measures of mortality. Specifically, some deaths occurring during or shortly after a hospital stay may not have been linked to that stay if the corresponding hospital bill were missing from the MedPAR file. Because the studies on mortality (and rehospitalization) were done at different

times than the study on utilization, the estimated shortfall in the MedPAR files used for this section differs from that indicated earlier in Table 4-2a. For the mortality and rehospitalization studies, the estimated shortfall was 4 percent or less for every year except 1980, when it was estimated to be 8 percent (Table 4-35). Mortality rates were not adjusted to reflect the shortfall because there is no way to quantity the effect of the shortfall on these rates.

In order to obtain mortality rates following discharge from the hospital, Medicare enrollment files, containing dates of death, were matched to the MedPAR records. In some cases, only the month and year of death are known; consequently, mortality rates are computed for deaths occurring in the month of admission or the following month. This represents, on average, deaths occurring within 6 weeks of admission, regardless of when the discharge occurred. Date of admission was used to define the time interval for tracking deaths, rather than date of discharge, to prevent changes in length of stay from biasing the findings.

Two measures of mortality are used in this section because there is no single way of measuring mortality that will provide an unambiguous picture of whether quality of care changed under PPS. Change in discharge rates is the primary factor that makes measures of mortality associated with hospitalization difficult to interpret.

The first measure of mortality is the number of deaths per 1,000 discharges (only the first hospitalization in a given year was included for any individual; any subsequent hospitalizations were ignored). This measure looks at deaths per hospitalization; only the first discharge in a year was used in the analysis to avoid

Table 4-35

Medicare discharges as a percent of all admission notices received, 1979-1984

Year	Discharges as percent of admission notices		
	U.S.	PPS states	Waiver states
1979	98.7	98.9	97.5
1980	92.0	92.2	90.2
1981	96.0	96.1	95.5
1982	99.0	99.0	98.8
1983	97.6	97.6	97.6
1984(FY)	96.0	95.9	96.7

SOURCE: MedPAR, PATBILL files, BDMS, HCFA

attributing deaths to more than one hospitalization in cases where two hospitalizations occurred in the same month. The advantage of this statistic is that it gives a straightforward case fatality rate for hospitalized beneficiaries. The disadvantage is that it can be affected by changes in the number of beneficiaries undergoing hospitalization, particularly if this has resulted in a change in the average severity of cases over time.

The second measure of mortality is the number of deaths occurring within 6 weeks of a hospital admission per 1,000 Medicare enrollees. This statistic is a measure of the rate of deaths associated with a hospitalization among the Medicare population. The advantage of using this statistic is that the numerator includes a complete count of all deaths occurring around the time of a hospital stay. In addition, the denominator involves population counts rather than hospital stay which fluctuated in number over the period of the study. The disadvantage is that changes in the pattern of hospitalizations can still affect this statistic. The shortfall in MedPAR bills for some years can also affect this statistic to the extent that some deaths may not have been appropriately matched to a preceding hospitalization.

Findings

The number of deaths per 1,000 hospitalizations (first admissions only) among the aged and disabled were higher in the waiver States than in the PPS States (Table 4-36 and Figure 4.4). In the PPS States, this mortality measure followed a similar pattern for aged, disabled, and ESRD beneficiaries, exhibiting declines in 1981 and 1982 and an increase in 1983 and 1984. Mortality among the aged

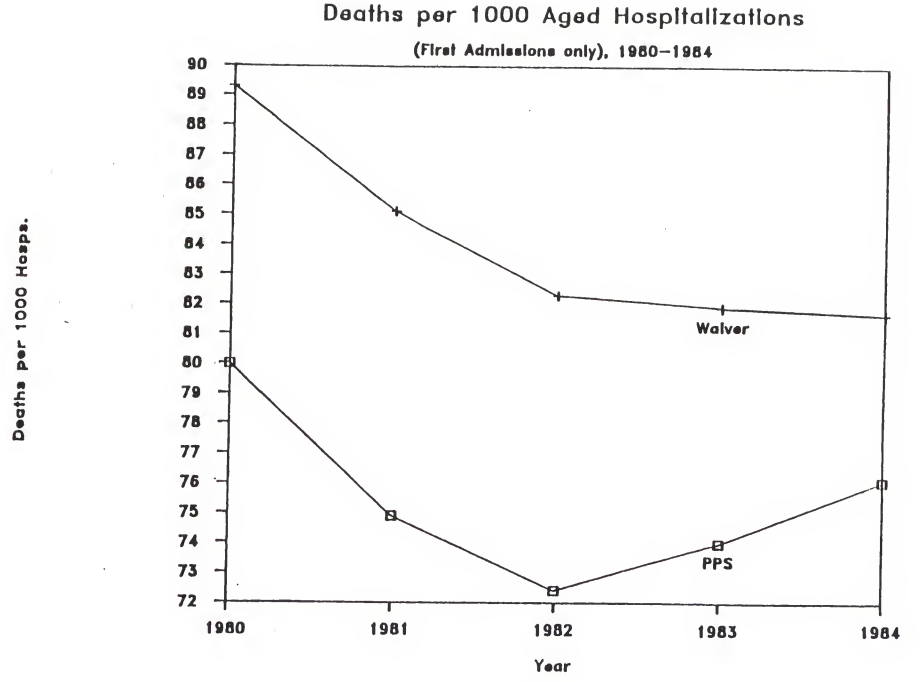
Table 4-36

Number of deaths per 1,000 hospitalizations (first admissions only) occurring within six weeks of an admission and percent change by type of beneficiary and whether PPS or waiver state, U.S., 1980-1984

Year	PPS states			Waiver states		
	Aged	Disabled	ESRD	Aged	Disabled	ESRD
1980	80.0	38.7	65.6	89.3	44.7	76.5
1981	74.9	37.2	62.1	85.1	40.2	63.8
1982	72.4	35.4	61.9	82.3	42.7	61.4
1983	74.0	35.8	65.6	81.9	35.8	62.0
1984 (FY)	76.1	37.6	68.2	81.7	38.1	59.4
Average annual percent change:						
1980-83	-2.5	-2.4	0.0	-2.8	-6.7	-6.3
1983-84	3.7	6.5	5.3	-0.3	8.9	-5.5

Adjusted to the age and sex distribution of 1984 Medicare discharges by the direct method.

FIGURE 4.4


Deaths per 1000 Aged Hospitalizations
(First Admissions only), 1980–1984
Deaths per 1000 Hospa.
90
89
88
87
86
85
84
83
82
81
80
79
78
77
76
75
74
73
72
Waiver
PPS
1980
1981
1982
1983
1984
Year

increased 3.7 percent in 1984 to a level of 76.1 per 1,000 discharges, for the disabled the increase was 6.5 percent to 37.6 per 1,000 and, for ESRD beneficiaries, it was 5.3 percent (not statistically significant) to a level of 68.2 per 1,000 discharges. Mortality in the waiver States declined slightly in 1984 for the aged (0.3 percent), rose for the disabled (8.9 percent), and decreased for ESRD (5.5 percent). In the waiver States, mortality declined among the aged in each of the years 1981-1984, although the declines were very slight after 1982. As will be shown next, the results differ for the second post-admission mortality measure.

Table 4-37 and Figure 4.5 show post-admission mortality per 1,000 aged enrollees within 6 weeks of hospital admission. In 1984, the first year of PPS, mortality declined by 4.1 percent in the PPS States to 29.3 per 1,000 enrollees and declined by 0.7 percent in the waiver States to 29.1 per 1,000. Among the disabled, mortality rose in the PPS States each year between 1980 and 1983 (an average of 2.3 percent annually) and declined in 1984 by 2.0 percent to 15.7 per 1,000 enrollees. The 1984 decline was not statistically significant, however. In the waiver States, there was no consistent trend among disabled beneficiaries between 1980 and 1984; mortality rose 2.6 percent in 1984 to 14.7 per 1,000. Mortality rates among ESRD beneficiaries were much higher than among aged and disabled beneficiaries, reaching 104.6 per 1,000 enrollees in the PPS States in 1984. Among ESRD beneficiaries, mortality rose in 1981 and 1982 and then declined in 1983 in both PPS and waiver States. In 1984, the mortality rate rose by 4.1 percent in the PPS States (not a statistically significant increase) and decreased by 7.3 percent in the waiver States.

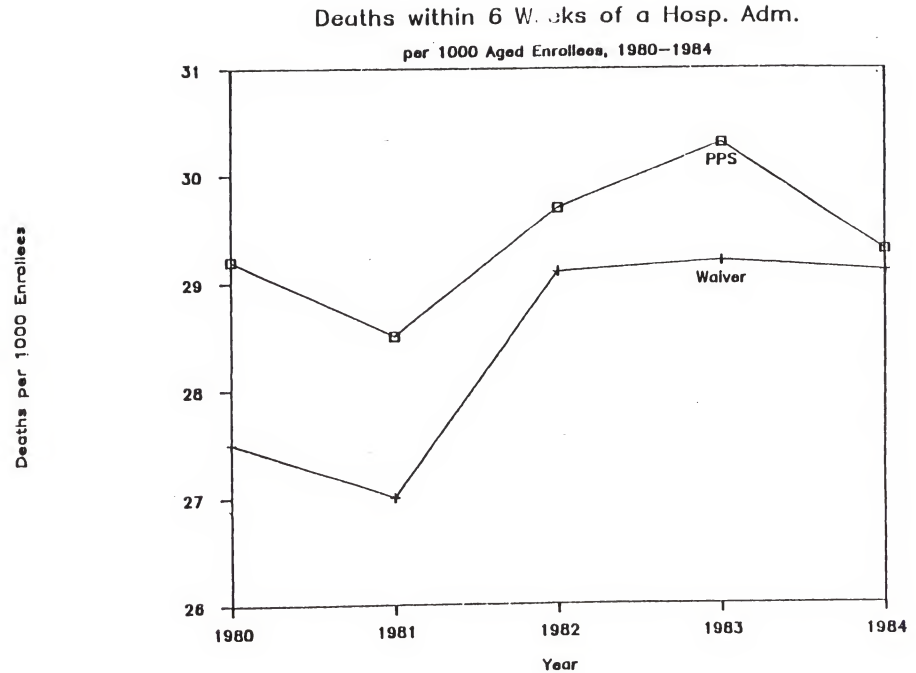
Table 4-37

Number of deaths per 1,000 enrollees occurring within six weeks of a hospital admission and percent change by type of beneficiary and whether PPS or waiver state, U.S., 1980-1984

Year	PPS states			Waiver states		
	Aged	Disabled	ESRD	Aged	Disabled	ESRD
1980	29.2	15.0	97.3	27.5	14.6	80.6
1981	28.5	15.1	100.2	27.0	14.0	84.8
1982	29.7	15.8	107.8	29.1	15.8	93.6
1983	30.3	16.0	101.5	29.2	14.4	87.2
1984 (FY)	29.3	15.7	104.6	29.1	14.7	82.4
Average annual percent change:						
1980-83	1.2	2.3	1.4	2.1	-0.6	2.7
1983-84	-4.1	-2.0	4.1	-0.7	2.6	-7.3

Adjusted to the age and sex distribution of the 1984 Medicare population by the direct method.

FIGURE 4.5


Deaths within 6 Weeks of a Hosp. Adm.
per 1000 Aged Enrollees, 1980–1984
Deaths per 1000 Enrollees
31
30
29
28
27
26
PPS
Waiver
1980
1981
1982
1983
1984
Year

The two mortality measures described above appear to provide contradictory indications of what the impact of PPS, if any, has been on quality of care. The number of deaths per 1,000 discharges increased in 1984 in the PPS States and remained almost unchanged in the waiver States, raising questions regarding quality of care. The number of deaths occurring within 6 weeks of a hospital admission, per 1,000 enrollees, declined more in the PPS States than in the waiver States in 1984 (for aged and disabled enrollees), which would suggest no adverse effects of PPS. The explanation for these paradoxical findings probably lies with the decline of 3.5 percent in the discharge rate experienced in 1984 in the PPS States which has never occurred in Medicare before. In the same period, the discharge rate increased 1.0 percent in the waiver States. It is likely that much of the reduction in hospitalization in 1984 was among patients who were less severely ill and who may be expected to experience relatively low mortality (for example cataract operations are now commonly performed on an outpatient basis). If many low-risk hospitalizations were eliminated in 1984, then the remaining hospitalized population would contain sicker patients on average, who should exhibit higher rates of mortality per discharge. The number of deaths per 1,000 hospitalizations (first admissions only) may have been particularly affected by the 1984 decline in admissions because the decline in the number of beneficiaries undergoing hospitalization, which is the same as the number of first admissions, in 1984 was of greater magnitude than the decline in total number of admissions (Table 4-38 and Figure 4.6).

The decline in admissions may also have produced an artificial decline in the number of deaths within 6 weeks of a hospital admission per 1,000 enrollees. For example, some deaths that may in previous years have occurred during a hospital

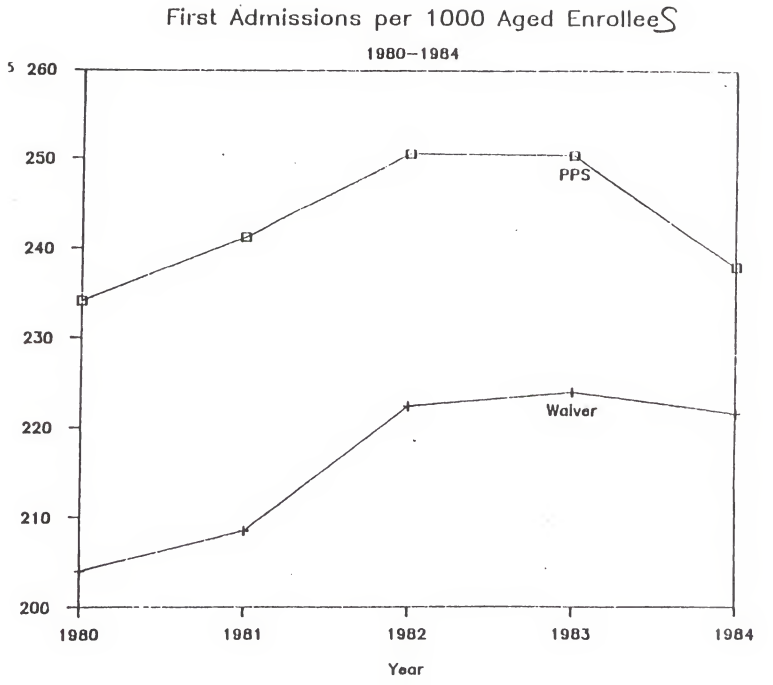
Table 4-38

Number of persons hospitalized per 1,000 enrollees and percent change by type of beneficiary and whether PPS or waiver State, U.S., 1980-1984

Year	PPS States			Waiver States		
	Aged	Disabled	ESRD	Aged	Disabled	ESRD
1980	234.1	229.1	601.1	204.0	200.9	538.6
1981	241.3	236.3	619.6	208.5	204.9	542.9
1982	250.6	249.0	707.7	222.4	220.0	610.5
1983	250.4	247.3	614.2	224.0	217.2	539.4
1984 (FY)	238.0	233.5	600.1	221.6	212.8	542.5
Average annual percent change:						
1980-83	2.3	2.6	0.7	3.3	2.7	0.0
1983-84	-6.6	-7.5	-3.1	-1.4	-2.7	0.8

Adjusted to the age and sex distribution of the 1984 Medicare population by the direct method.

FIGURE 4.6


First Admissions per 1000 Aged Enrollees
1980-1984
5 260
250
240
230
220
210
200
PPS
Waiver
1980
1981
1982
1983
1984
Year
First Admissions per 1000 Enrollees

stay may have occurred outside the hospital in 1984, due to the lower probability of being admitted to a hospital. Moreover, some excess deaths could have occurred due to a lack of access to hospital care, rather than to premature discharge or poor hospital care. Such deaths would not show up in mortality statistics measured in association with hospital stays. It does not appear that such deaths increased in 1984, however, because total mortality among the aged population (regardless of whether a hospital stay was involved) was shown previously to have decreased slightly in the PPS States in 1984. On balance then, there is no substantial evidence at this time to indicate a true increase in mortality following implementation of PPS.

There is some concern that any adverse effects of prospective payment on quality of care may affect the oldest beneficiaries more than younger ones. The most elderly beneficiaries are generally more frail, are more likely to have chronic conditions, and take longer to recover from operations or other procedures. Mortality rates were computed separately for beneficiaries 85 or older in both PPS States and waiver States (Table 4-39). The data indicate that death rates for the very old were substantially higher than for the population 65 or older, but that trends in death rates for the very old were similar to mortality trends for all beneficiaries 65 or older. For example, in the PPS States, the number of deaths per 1,000 discharges (first admissions only) increased in 1984 by 3.2 percent for those 85 or over and by 3.7 percent for everyone over 65. On the other hand, hospitalization-associated deaths per 1,000 enrollees decreased in 1984 by 3.2 and 3.7 percent, respectively. In general, mortality rates among those 85 or older exhibited the same patterns as the general beneficiary population 65 or older, though at a higher absolute level.

Table 4-39

Mortality rates for beneficiaries 85 years or older and percent change for PPS states and waiver states, U.S., 1980-1984

Year	PPS states		Waiver states	
	Deaths per 1,000 enrollees	Deaths per 1,000 hospitalizations (first admissions only)	Deaths per 1,000 enrollees	Deaths per 1,000 hospitalizations (first admissions only)
1980	72.6	153.0	65.4	162.0
1981	68.5	139.9	64.0	154.2
1982	72.9	136.7	69.2	150.9
1983	75.3	140.4	70.6	150.7
1984 (FY)	74.0	143.8	71.4	151.6
Average annual percent change:				
1980-83	1.3	-2.7	2.6	-2.3
1983-84	-2.3	3.2	1.5	0.8

Trends in DRG-specific mortality are not presented in this report due to non-comparability between years, caused by the extensive coding changes that have apparently taken place with the initiation of PPS. As indicated earlier in this chapter, the discharge rate for a great many DRGs rose or fell dramatically in 1984. Consequently, the characteristics (and severity) of discharges coded to specific DRGs may be very different in 1984 than in previous years. Because of the uncertain effect of coding changes on the mortality rates associated with individual DRG categories, the possible effect of PPS on patients with specific kinds of conditions cannot be identified. Trends in DRG-specific mortality rates will be tracked post-PPS, provided that coding practices appear to have stabilized. The effect of PPS on patients with specific types of conditions will also be analyzed through a Rand Corporation study which will examine process and outcomes of care for several specific diseases using a detailed review of medical records.

Hospital Readmissions

Rehospitalization rates can reflect outcomes to the extent that premature discharge or other poor quality care can result in the need for a patient to return to the hospital or additional care. Therefore an increase in readmissions might indirectly indicate a deterioration in quality of care. This section examines trends in readmission rates and, particularly, changes occurring after the implementation of prospective payment. Statistics on readmissions are presented separately for States in which prospective payment is currently underway (PPS States) and for the four States in which prospective payment was waived in 1984. Changes in readmission patterns in the PPS States were compared to changes occurring in the four waiver States, which served as a comparison group.

Methods and Data

The principal data source was HCFA's MedPAR files for the years 1979-1984, which are derived from the inpatient hospital stay files. (See "Methods and Data" discussion under "Hospital Utilization.)"

The measures of rehospitalization used in this section are rehospitalization within 30 days of discharge and 60 days of discharge. Rehospitalizations are calculated using a MedPAR file limited to discharges occurring during a calendar year. (For 1984, a fiscal year-based MedPAR file was used.) The fact that the annual MedPAR files do not contain information on hospital stays extending beyond a particular year will tend to somewhat understate rehospitalization rates for all

years of the study. For example, if a discharge occurred in December 1979, then a rehospitalization occurring in January 1980 would not be included in statistics on readmission rates within 30 days of discharge. Furthermore, if a discharge occurred in October 1979, followed by a rehospitalization in November, the November rehospitalization would be included in the readmission statistics only if the discharge associated with that rehospitalization occurred before December 31. Although these late rehospitalizations could have been identified by linking MedPAR files from adjacent years, this was not done because complete data on stays occurring in FY 1985 were not available to link to the FY 1984 MedPAR file. Because the same degree of undercounting occurs for all years included in the analysis, it was not considered a serious problem for purposes of measuring changes in readmission rates over time. The shortfall in MedPAR bills described previously has also caused the readmission rates to be understated. Readmission rates have not been adjusted to reflect the shortfall because there is no way to quantify the effect of the shortfall on these rates.

Findings

The rate of rehospitalization generally increased from 1979 to 1984 for aged and disabled beneficiaries, though not for ESRD beneficiaries (Table 4-40). Among aged beneficiaries, readmissions within 30 days of discharge increased at the average rate of 0.9 percent in 1984. The experience in the waiver States was similar with an average 4.5 percent increase between 1979 and 1983 and a 1.0 percent increase in 1984. Much of the increase in readmission rates in both groups of States occurred in 1982, with over a 10 percent increase in that year. Thereafter, the rates remained stable in the PPS States with a small annual increase

Table 4-40

Number of beneficiaries rehospitalized within 30 days of discharge, per 1,000 live discharges, and percent change by type of beneficiary for PPS and waiver States, U.S., 1979-1984

Year	PPS states			Waiver states		
	Aged	Disabled	ESRD	Aged	Disabled	ESRD
1979	162	191	330	137	176	337
1980	156	182	301	134	163	265
1981	161	187	304	141	168	269
1982	179	204	310	159	193	310
1983	177	207	317	161	182	332
1984 (FY)	178	208	320	163	192	308
Average annual percent change:						
1979-83	2.2	2.1	-1.0	4.5	0.9	-0.4
1983-84	0.9	0.9	1.2	1.0	7.3	-9.6

Adjusted to the age and sex distribution of 1984 Medicare discharges by the direct method.

in the waiver States. During 1982-1984, rehospitalization occurred in the range of 177-179 per 1,000 live discharges in the PPS States and rose from 159 to 163 per 1,000 live discharges in the waiver States. Readmission rates were consistently higher in the PPS States.

Rehospitalization rates among the disabled were slightly higher than for the aged, although trends were generally similar for the disabled and aged. Readmission among the disabled increased at an average rate of 2.1 percent between 1979 and 1983 in the PPS States and at the annual rate of 0.9 percent in 1984. The waiver States experienced an average 0.9 percent increase during 1979-1983 and a 7.3 percent increase in 1984. Both groups of States exhibited a large increase in readmission in 1982.

ESRD beneficiaries exhibited a decline in rehospitalization in 1980 in both PPS and waiver States, followed by small yearly increases through 1983. In 1984, the readmission rate for ESRD beneficiaries in PPS States increased slightly (1.2 percent annually) and decreased in the waiver States (9.6 percent annually).

All trends in readmission rates should be interpreted very cautiously because of the different degrees of completeness of the MedPAR files for the various years, as explained in previous sections. Missing bills obviously may tend to understate readmission rates. For example, rehospitalization rates were lowest in 1980, which was the year with the least complete MedPAR file.

Readmission patterns for the aged within 60 days of discharge were similar to those within 30 days of discharge for the aged (Table 4-41). Readmissions increased

Table 4-41

Number of aged beneficiaries rehospitalized within 60 days of discharge, per 1,000 live discharges for PPS States and waiver States, U.S., 1979-1984

Year	Readmissions per 1,000 live discharges	
	PPS states	Waiver states
1979	227	198
1980	218	194
1981	225	202
1982	245	225
1983	243	228
1984 (FY)	245	231
Average annual percent change:		
1979-83	1.8	3.9
1983-84	1.1	1.4

Adjusted to the age and sex distribution of 1984 Medicare discharges by the direct method.

at the average rate of 1.8 percent annually between 1979 and 1983 in the PPS States and at the annual rate of 1.1 percent in 1984. The waiver States experienced an average annual increase of 3.9 percent between 1979 and 1983 and a 1.4 percent increase in 1984. As with the 30 day readmission rates, readmissions after 60 days were at a stable level during 1982-1984 in the PPS States and rose slightly during that time in the waiver States.

PROs are required to review all readmissions within 7 days of hospital discharge for appropriateness. The concern has been that some hospitals may discharge patients prematurely, with a subsequent need for them to return to the hospital. Payment has been denied on the average for 2.8 percent of such readmissions in 1984.

PRO review of all readmissions within 7 days may have created an incentive for hospitals and physicians to readmit patients at 8 or 9 days following discharge in order to avoid PRO review. In 1984, there was a 3 percent increase in the number of patients rehospitalized at 8 or 9 days past discharge per 1,000 discharge in the PPS States and a 1.3 percent increase in the waiver States (Table 4-42). In both PPS and waiver States, readmission rose at a moderate rate from 1980 to 1983 (1.7 and 3.4 percent, respectively). Although the 1984 increase in readmissions in the PPS States is slightly higher than the average increase during 1979-1983, it was a decease from 1979 to 1980 that caused the 1979-1983 rate to be so low. The 1984 increase succeeded increases of equal or greater magnitude in 1981, 1982, and 1983. The 1984 rate of increase in the PPS States for the 8th or 9th day is somewhat higher than the rate of increase in 30-day and 60-day readmissions, however. On

Table 4-42

Number of aged beneficiaries rehospitalized on the 8th or 9th day following discharge, per 1,000 live discharges for PPS states and waiver States. U.S., 1979-1984

Year	Readmissions per 1,000 live discharges	
	PPS States	Waiver States
1979	10.9	9.5
1980	10.6	9.5
1981	10.8	10.0
1982	11.4	10.4
1983	11.7	10.8
1984(FY)	11.9	10.9
Average annual percent change:		
1979-83	1.7	3.4
1983-84	3.0	1.3

Adjusted to the age and sex distribution of 1984 Medicare discharges by the direct method.

balance, however, there is little evidence that some patients may have been rehospitalized on the 8th or 9th day following discharge to avoid PRO review.

As was demonstrated in the case of post-discharge mortality, readmission trends presented here indicate that quality of care has not suffered. Rehospitalization within 30 days of discharge remained relatively stable amoung the aged in the PPS States in 1983 and 1984 and rose steadily for the disabled between 1981 and 1984 (the increase was only 0.9 percent in 1984). This suggests that there was no demonstrable increase in readmissions due to PPS.

Enrollee Liability

It has been estimated (Waldo and Lazenby, 1984) that in 1984 Medicare paid slightly less than half of the aged Medicare population's health bill. Federal and State Medicaid payments accounted for about 13 percent of the total aged health bill and other Government programs paid an additional 5 percent. Nearly all of the remaining 33 percent of the aged health bill, consisting of coinsurance, deductibles, noncovered goods and services, and private health insurance premimums, was paid for by the beneficiary. This report discusses that portion of beneficiary liability incurred as a result of cost sharing payments for covered Medicare services—specifically Medicare coinsurance, deductibles, and physician charges on unassigned claims that exceeded allowed charges. It will examine whether PPS has had a discernable impact on liability for Medicare beneficiaries.

Under the HI program, a beneficiary who is an inpatient in a hospital for services covered by Medicare is subject to a deductible and coinsurance. The amount of the deductible in any year is set by law to approximate the average cost of 1 day of hospitalization. Table 4-43 shows the amount of the deductible and coinsurance for 1977 through 1986. In 1977 the inpatient hospital deductible was $124 per benefit period and, by 1986, it had increased to $492. The year-to-year percent increase has varied between 11 percent and 17 percent in all but 2 years. In 1982, it was 27 percent higher than in 1981 and, in 1986, it was 23 percent higher than in 1985. As will be discussed later, the large 1985-86 increase appears to be a direct consequence of PPS.

Table 4-43

Hospital Insurance (Part A) deductible and coinsurance amounts, 1977 - 1986

Year	Inpatient Hospital				Skilled Nursing
			Coinsurance		
	Deductible	Percent Change	61st-90th Day	Lifetime Reserve Days	Facility Coinsurance
1977	$124	--	$ 31	$ 62	$15.50
1978	144	16	36	72	18.00
1979	160	11	40	80	20.00
1980	180	13	45	90	22.50
1981	204	13	51	102	25.50
1982	260	27	65	130	32.50
1983	304	17	76	152	38.00
1984	356	17	89	178	44.50
1985	400	12	100	200	50.00
1986	492	23	123	246	61.50

A benefit period starts with an admission to a hospital and ends when the beneficiary has been discharged from a hospital or SNF for 60 consecutive days without an admission. HI pays for all covered services beyond the deductible for the first through 60th day of hospitalization during a benefit period. From the 61st through 90th day of hospitalization, the beneficiary pays coinsurance equal to one-fourth of the deductible which, in 1984, was $89 per day. In addition beneficiaries are entitled to 60 lifetime reserve days. If hospital days exceed 90 in a benefit period, the enrollee can use lifetime reserve days for which the copayment is equal to one-half the deductible or $178 per day in 1984. Under PPS, a beneficiary is deemed to have waived lifetime reserve days up to the length of stay outlier threshold, provided that he or she has not exhausted all of his or her regular days of hospital benefits (that is, other than lifetime reserve days) at the time of admission.

HI pays for inpatient skilled nursing or rehabilitation services after a hospital stay (of at least 3 days) for up to 100 days in a participating SNF in each benefit period. All SNF services are covered for the first 20 days. The beneficiary is liable for a copayment equal to one-eighth the inpatient hospital deductible for the next 80 days. This copayment was $44.50 per day in 1984. Home health services, covered primarily by HI, are not subject to copayments.

Under the SMI program, the beneficiary is subject to a deductible and coinsurance payment for the use of covered physician and other medical services and for outpatient services. (Some services, such as HHA visits and laboratory services, do not require copayments.) The deductible has been $75 since 1982. The copayment for SMI services is 20 percent of the approved charge allowed by Medicare after the deductible has been met. In addition, the beneficiary pays an

annual SMI premium, which was $175.20 in 1984. Finally, the beneficiary is liable for any physician charges on unassigned claims that exceed the approved charge.

Potential PPS Effects on Beneficiary Liability

PPS may change the mix of services used in a way that affects beneficiary liability. As shown in an earlier section of this chapter, the average length of stay in acute care hospitals dropped significantly in the first year of PPS. When persons are discharged earlier they may be sicker and, thus, be more likely to need skilled nursing services or home health services. This could result in more SNF admissions and longer SNF stays, thus increasing the number of days requiring coinsurance payments. At the same time, shorter hospital stays have the potential for decreasing the number of hospital coinsurance days. In recent years, the number of SNF coinsurance days have been only about 20 percent higher than hospital coinsurance days, whereas the coinsurance amount per day for SNF care is only half that of the hospital coinsurance amount. Depending on the relative magnitude of change in SNF and hospital coinsurance days, the net result of these two countervailing forces could be a decrease or an increase in beneficiary liability for coinsurance days. However, as will be shown below, from 1983 to 1984 the decrease in hospital coinsurance was considerably greater than the increase in SNF coinsurance.

On the other hand, the decrease in average length of stay is likely to raise the per diem hospital cost and, thus, the amount of the deductible to which the coinsurance payment is tied. This undoubtedly accounts for the large 1986 percentage increase in deductible which does not show up sooner because of the lag

built into the formula for setting the deductible. The deductible is by far the largest portion of beneficiaries' aggregate HI liability. The net result of all of these potential changes affecting copayments for HI could be an increase in beneficiary liability for HI.

There are other ways in which PPS might affect beneficiary liability. At the time that PPS was implemented, there was speculation that hospitals would increase admissions in order to increase revenue. This could have had the effect of increasing aggregate beneficiary liability. As it turned out, however, there has been a decline in admissions since PPS was implemented. While it is not clear that the decline was brought about by PPS incentives, this could be expected to favorably affect the amount of deductible payments per enrollee. There was also concern that some services, such as diagnostic tests, that ordinarily would have been done on an inpatient basis, would be offered on an outpatient basis for persons who were going to be admitted anyway. This would lead to an increase in SMI copayments that would not have been incurred under the old system. Finally, there is the possibility of incurring additional noncovered services. For example, some persons who are discharged earlier than they would have been under the old system may need to hire someone to help with routine household chores.

Changes in utilization and possible substitution effects have been examined elsewhere in this report. This section will examine whether the changes, if any, have had an impact on beneficiary liablilty. Time series data from 1977 through 1984 for the different types of beneficiary liability will be examined. While any deviation in 1984 from past trends cannot prove a PPS effect, it can provide

evidence of a potential impact, particularly if the deviation is in the direction expected.

Methods and Data

The data on reimbursements and beneficiary liability were produced by HCFA's Office of the Actuary (OACT) for the 1986 Trustees' Report. To a large extent the data were derived from bills that have passed through the HCFA bill processing system. Because of processing lags, it was necessary for OACT to adjust the aggregate data from the bills to get an estimate of what the payment and liability would have been if all of the bills had been processed. The later years' estimates require the most adjustment and, thus, are somewhat less reliable than the earlier years' estimates. However, since more than a year has passed since 1984, the large majority of the bills would have been processed when these estimates were made. Thus the data shown here are expected to be quite reliable.

Trends in Beneficiary Liability

To set the stage for a discussion of beneficiary liability, Table 4-44 shows payments by type of service from 1977 through 1984. Aggregate payment has increased from $22 billion in 1977 to $64 billion in 1984. On a per enrollee basis the increase has been from $838 to $2,109. The percent change in dollars per enrollee shows that the year to year changes increased at an increasing rate through 1980 from a 13 percent increase from 1977 to 1978 to an 18 percent increase in both the 1979-80 and 1980-81 periods. Beginning in 1982, the increase slowed in each year, reaching a low of 9 percent in 1983-84. Much of the slower rate can be attributed

Table 4-44
Total Medicare reimbursement and reimbrusement and percent change per enrollee by type of service, 1977-1984

	Total	Inpatient Hospital	Skilled Nuring Facility	Home Health Agency	Outpatient Hospital[1/]	Physician Services[2/]	Independent Lab	Group Practice and Health Maintenance Organization
				(millions of dollars)				
1977	$22,184	$15,098	$350	$ 497	$1,129	$ 4,936	$ 72	$102
1978	25,692	17,357	356	595	1,368	5,820	86	110
1979	30,108	20,216	372	682	1,649	6,933	105	151
1980	38,364	24,417	411	818	1,988	8,384	137	211
1981	43,613	29,265	450	1,054	2,358	10,043	175	268
1982	51,108	33,853	487	1,380	2,780	12,066	209	331
1983	57,884	37,520	521	1,766	3,301	14,108	253	415
1984	84,239	41,285	553	2,108	3,777	15,500	511	505
				(dollars per enrollee)				
1977	$ 838	$ 595	$ 13	$ 19	$ 45	$ 195	$ 3	$ 4
1978	946	648	13	22	52	223	3	4
1979	1,081	736	14	24	62	259	4	8
1980	1,277	870	15	29	72	306	5	8
1981	1,503	1,024	18	36	84	359	8	10
1982	1,733	1,165	17	47	98	425	7	12
1983	1,928	1,268	18	59	114	487	9	14
1984	2,109	1,376	18	69	128	527	17	17
				(percent change in dollars per enrollee)				
1977-78	13	9	-1	17	18	15	18	5
1978-79	14	14	2	8	17	16	19	34
1979-80	18	18	8	22	18	18	27	36
1980-81	18	18	7	28	18	17	25	25
1981-82	15	14	6	29	16	18	17	21
1982-83	11	9	5	26	16	15	19	23
1983-84	9	9	5	18	13	8	99	20

1/ About 80 percent are billings from outpatient hospitals and 20 percent are billings from other facilities such as rural health clinics.

2/ About 90 percent are for physicians' services and the remainder for goods and services such as durable medical equipment and ambulance service.

to a slowing of the increase in payment for inpatient hospital services which went from 18 percent in 1980-81 to 9 percent in 1982-83 and 1983-84. In 1982, hospital payment first came under TEFRA cost limits and, of course, 1984 was the first full year of PPS. Both of these payment changes undoubtedly contributed to the decreasing rate of increase for inpatient services. In addition, the rate of growth in the medical care component of the consumer price index (CPI) slowed considerably in the later years. The index increased 11.6 percent in the 1981-82 period, 8.7 percent in 1982-83, and 6.2 percent in 1983-84. Thus, it is difficult to untangle the influence of TEFRA and PPS from other potential causes of the decreasing rate of growth.

Payments per enrollee for physician services also showed the smallest rate of increase, 8 percent, in 1983-84, down from 15 percent in 1982-83. Much of the 1983-84 slowing in the rate of increase can probably be attributed to a change in the law that became effective July 1, 1984. The change froze physician payments at levels in effect for the 12-month period ending June 30, 1984. Outpatient services also showed the smallest increase (13 percent) in 1983-84. Changes in SNF and HHA, while more erratic than the other services, showed a potential decrease in 1983-84. The increase of 99 percent in payment for independent laboratory services in 1983-84 resulted largely from a change in billing regulations. Beginning in 1984, lab services furnished by an independent laboratory must be billed separately instead of being integrated with physicians' bills as they often were before 1984. Also, effective July 1, 1984 independent laboratory and assigned physician physician claims for laboratory services were paid at 100 percent, that is, no coinsurance. This will have little effect on physician services because laboratory costs are only about 2 percent as great as physician costs.

Table 4-45 shows the percent of total dollars accounted for by each type of service. Inpatient hospitals accounted for from 67-68 percent of all reimbursements from 1977 through 1981 after which its share began to decline until it reached 64 percent in 1984. SNFs appear to be receiving a decreasing share for the entire period from 1977 through 1984. All other services show small to moderate increases. Thus there is some evidence of a shift away from inpatient hospitals to other settings beginning in 1982 and continuing through 1984.

Table 4-46 shows a summary of combined beneficiary liability per enrollee under both HI and SMI. There was an increase from $167 per enrollee in 1977 to $426 per enrollee in 1984. The rate of change increased to a high of 21 percent in 1982 after which it declined to a low of 7 percent in 1984. Some of the reasons for the sharp 1984 decline are discussed later. Table 4-47 shows that the total of reimbursement and beneficiary liability increased from $1,005 per enrollee in 1977 to $2,535 per enrollee in 1984. However, the beneficiary portion of this amount remained nearly constant at 16 to 17 percent from 1977 through 1984.

Table 4-48 shows HI Medicare beneficiary liability for 1977 through 1984. Aggregate liability increased from $1.1 billion in 1977 to $3.5 billion in 1984, a relative increase of 223 percent. Hospital deductibles increased by 240 percent while hospital coinsurance increased by only 163 percent. This relatively low rate of increase is attributable to the sharp drop in coinsurance dollars in 1984, the only such decrease in the 8 years shown. SNF coinsurance increased by 170 percent. In 1977, the total HI liability was $42 per enrollee. This increased to $118 by 1984. The portion of overall dollars per enrollee accounted for by the three components (i.e., inpatient deductible, inpatient coinsurance, and SNF coinsurance) was quite

Table 4-45

Percent distribution of total dollars by type of service, 1977 - 1984

Year	Total	Inpatient Hospital	Skilled Nuring Facility	Home Health Agency	Outpatient Hospital[1/]	Physician Services[2/]	Independent Lab	Group Practice and Health Maintenance Organization
1977	100	68.1	1.6	2.3	5.1	22.3	0.3	0.5
1978	100	67.6	1.4	2.3	5.3	22.7	0.3	0.4
1979	100	67.1	1.2	2.3	5.5	23.0	0.3	0.5
1980	100	67.1	1.1	2.2	5.5	23.1	0.4	0.6
1981	100	67.1	1.0	2.4	5.4	23.0	0.4	0.6
1982	100	66.2	1.0	2.7	5.4	23.6	0.4	0.6
1983	100	64.8	0.9	3.1	5.7	24.4	0.4	0.7
1984	100	64.3	0.9	3.3	5.9	24.1	0.8	0.8

4.82a

Table 4-46

Summary of HI and SMI
liability per enrollee, 1977 - 1984

Year	Combined HI and SMI liability per enrollee	
	Dollar	Percent Change
1977	$167	--
1978	187	12
1979	212	13
1980	249	17
1981	292	17
1982	353	21
1983	400	13
1984	426	7

Table 4-47

Reimbursement per enrollee and beneficiary liability per enrollee as percent of total reimbursement, 1977-1984

Year	Total reimbursement per enrollee	Beneficiary liability	
		Amount per enrollee	As percent of total reimbursement
1977	$1,005	$167	17
1978	1,133	187	17
1979	1,293	212	16
1980	1,526	249	16
1981	1,795	292	16
1982	2,086	353	17
1983	2,328	400	17
1984	2,535	426	17

Table 4-48

Beneficiary liability under the Medicare Hospital Insurance program, liability per enrollee and percent change, 1977 - 1984

Year	Total	Inpatient hospital		Skilled Nursing Facility
		Deductible	Coinsurance	Coinsurance
		(millions of dollars)		
1977	$1,091	$ 844	$171	$ 76
1978	1,311	1,019	210	82
1979	1,512	1,168	257	87
1980	1,807	1,395	312	100
1981	2,080	1,615	355	110
1982	2,804	2,131	524	149
1983	3,302	2,540	584	178
1984	3,526	2,870	450	206
		(dollars per Part A enrollee)		
1977	$ 42	$ 32	$ 7	$ 3
1978	49	38	8	3
1979	55	43	9	3
1980	64	50	11	4
1981	73	56	12	4
1982	96	73	18	5
1983	112	86	20	6
1984	118	96	15	7
		(percent change in dollars per enrollee)		
1977-78	17	18	20	5
1978-79	12	12	19	3
1979-80	17	17	19	12
1980-81	13	14	12	8
1981-82	33	30	45	33
1982-83	16	17	10	17
1983-84	5	11	24	14

stable from 1977 through 1983--about 77 percent for the hospital deductible, about 17 percent for the hospital coinsurance, and about 6 percent for the SNF coinsurance. However, in 1984 the hospital deductible accounted for 81 percent, hospital coinsurance for 13 percent, and SNF coinsurance for 6 percent of the total. From 1983 to 1984, the SNF coinsurance increased by $28 million while hospital coinsurance decreased by $134 million resulting in a net decrease of HI beneficiary coinsurance liability of $106 million.

The year-to-year percent change in dollars per enrollee was fairly erratic, ranging from a low of 12 percent in 1978-79 to a high of 33 percent in 1981-82. The percent change in liability dropped to 16 percent in 1982-83 and then to 5 percent in 1983-84. This very small 1983-84 increase is attributable largely to the dramatic 24 percent decrease in hospital coinsurance per enrollee. This decrease in coinsurance amounts is the most clear-cut PPS impact on beneficiary liability. Table 4-49 gives more details of this impact. The number of persons using coinsurance days decreased from 294,000 in 1983 to 204,000 in 1984, a decrease of 31 percent. Aggregate coinsurance days decreased by 36 percent and coinsurance days per enrollee decreased by 37 percent. Because total days per enrollee decreased by only 16 percent, coinsurance days also decreased as a percent of total days. Aggregate dollars and dollars of liability per beneficiary decreased by 23 and 24 percent, respectively. Apparently the decrease in average length of stay attributed to PPS is having a large impact on the very long stays which result in coinsurance liability for the beneficiary.

Table 4-50 shows the SMI Medicare beneficiary liability. Aggregate SMI liability is roughly three times the amount of HI liability, ranging from $3.3 billion

Table 4-49

Number of persons (aged and disabled) using coinsurance days, coinsurance dollars and percent change, U.S., 1983-1984

Measure	1983	1984	Percent change
Persons using coinsurance days (thousands)	294	204	-31
Coinsurance days used (thousands)	5,332	3,409	-36
Coinsurance days per thousand enrollees	180	114	-37
Coinsurance dollars (millions)	$ 584	$ 450	-23
Coinsurance dollars per enrollee	20	15	-24

Table 4-50

Beneficiary liability under the Supplementary Medical Insurance program, liability per enrollee and percent change, 1977 - 1984

Year	Total	Deductible	Coinsurance	Amount above reasonable charge screens
		(millions of dollars)		
1977	$3,327	$1,049	$1,474	$ 804
1978	3,757	1,102	1,745	910
1979	4,406	1,158	2,091	1,157
1980	5,284	1,208	2,535	1,541
1981	6,382	1,357	3,072	1,953
1982	7,623	1,573	3,770	2,280
1983	8,701	1,689	4,502	2,510
1984	9,443	1,739	4,984	2,720
		(dollars per Part B enrollee)		
1977	$ 131	$ 42	$ 58	$ 32
1978	144	42	67	35
1979	165	43	78	43
1980	193	44	93	56
1981	228	49	110	70
1982	268	55	133	80
1983	300	58	156	87
1984	321	59	170	92
		(percent change in dollars per enrollee)		
1977-78	10	2	15	9
1978-79	15	2	17	23
1979-80	17	2	18	30
1980-81	18	10	19	25
1981-82	18	14	21	14
1982-83	12	5	17	9
1983-84	7	1	9	6

in 1977 to $9.4 billion on 1984. The overall relative increase was 183 percent. The relative increase in the deductible over the 8-year period is only 66 percent. This small relative increase is accounted for by the fact that the deductible amount is set by statute rather than indexed automatically and was a constant $60 from 1977 through 1981 and $75 from 1982 through 1984. Both coinsurance and the amount above reasonable charges for unassigned claims increased by about 240 percent.

Overall, dollars of liability per enrollee increased from $131 in 1977 to $321 in 1984. The deductible accounted for a decreasing share of this—from 31 percent in 1977 to 18 percent in 1984. At the same time, SMI coinsurance increased from 44 percent of overall liability in 1977 to 53 percent in 1984. Liability from unassigned claims increased from 24 percent of the overall to 29 percent.

The year-to-year percent change in SMI liability increased from 10 percent in 1977-78 to 18 percent in 1981-82 and then declined to a low of 7 percent in 1983-84. The three components showed a somewhat similar pattern with the lowest percent increases occurring in the 1983-84 period, for which there was a 1 percent increase in the deductible, a 9 percent increase in the coinsurance, and a 6 percent increase in liability from unassigned claims. Much of the 1983-84 slowing in the rate of increase in liability can probably be attributed to two changes in the law that became effective July 1, 1984. One change was the freezing of physician payments discussed earlier. This would have the effect of decreasing both deductibles and coinsurance payments and liability on unassigned claims. The other change made it more attractive for physicians to accept assignment. In 1984 the number of claims assigned was 59 percent of the total, up from 54 percent the previous year (McMillan, et al.,1985). This increase in assignment rate would have

the effect of slowing the rate of increase in beneficiary liability for unassigned claims. These law changes are probably responsible for the lower 1984 rates of increase in beneficiary liability. There is no reason to attribute a causal relationship between the observed changes and PPS.

Table 4-51 shows the share of total HI and SMI liability accounted for by each of the components. Inpatient deductible shows a slow increase in its share of the total, from 19.1 percent in 1977 to 22.1 percent in 1984; inpatient coinsurance showed a decrease from 3.9 percent to 3.5 percent. SNF coinsurance showed a slight decline. SMI deductible decreased from a 23.7 percent share in 1977 to 13.4 percent in 1984, a decline consistent with the fact that the deductible has been nearly constant over this period. SMI coinsurance, on the other hand, increased from 33.4 percent of the total in 1977 to 38.4 percent in 1984. Most of this increase occurred prior to 1982. All of the trends are fairly consistent for the entire 8-year period and, thus, show little evidence that PPS caused any major shifts among the components of liability in 1984 beyond its impact on hospital coinsurance and the deductible amount.

In summary, this section of the report has looked at PPS impact on the beneficiary from the viewpoint of the effect on beneficiary liability for covered Medicare services. The most apparent impact of PPS on beneficiary liability is in the dramatic reduction in liabilities incurred for coinsurance days. There has also been a slowing in the rates of increase in the other components of beneficiary liability. However, because of the general slowing of inflation and the fact that we have only 1 year of PPS data, it would be inappropriate to fully attribute these changes to PPS.

Table 4-51

Total liability and percent distribution by type of service, 1977 - 1984

Year	Total		Hospital Insurance				Supplementary Medical Insurance			
				Inpatient hospital		Skilled Nursing Facility Coinsurance				
	Millions of Dollars	Percent	Total	Deductible	Coinsurance		Total	Deductible	Coinsurance	Unassigned Claims
1977	$4,418	100	24.7	19.1	3.9	1.7	75.3	23.7	33.4	18.2
1978	5,068	100	25.8	20.1	4.1	1.6	74.1	21.7	34.4	18.0
1979	5,918	100	25.5	19.7	4.3	1.5	74.5	19.6	35.3	19.6
1980	7,091	100	25.5	19.7	4.4	1.4	74.4	17.0	35.7	21.7
1981	8,462	100	24.6	19.1	4.2	1.3	76.0	16.0	36.3	23.7
1982	10,427	100	26.8	20.4	5.0	1.4	73.2	15.1	36.2	21.9
1983	12,003	100	27.6	21.2	4.9	1.5	72.5	14.1	37.5	20.9
1984	12,969	100	27.2	22.1	3.3	1.6	72.8	13.4	38.4	21.0

Hospital Use and Patient Disposition and Severity

This section has been extracted from the findings of a report prepared by CPHA supported through a cooperative agreement with HCFA. As with previous sections on utilization and mortality, the data presented here compare predicted and actual PPS values for a variety of quality indicators. Predicted values are based upon pre-PPS trends and include a variety of utilization, patient disposition, and severity indicators. The primary advantage of this report lies in its ability to use the non-Medicare patient population as a comparison group. This section thus stands in contrast to previous parts of this chapter which rely only on Medicare patient and population data.

This section is based upon two sources of data. One source is the Professional Activity Study (PAS) data base maintained by CPHA, which contains time-series information for a nationwide panel of hospitals. Using these data, patient discharges were analyzed from the third quarters of 5 consecutive years, 1980-1984. Third quarter data were used because all hospitals were on PPS by the third quarter of 1984. Hospitals were included in this analysis only if they had complete data for the third quarters of 1980-1984. Hospitals in waivered States were excluded from this study.

A total of 650,596 discharges from 729 U.S short-term general, non-Federal hospitals are included in this study. However, not all of these 729 hospitals reported data for the entire study period on the entire array of variables included in the analysis. The variables affected by partial reporting include: (1) whether or not a patient stay involved use of an ICU or CCU, (2) whether or not a patient stay

involved at least one physician consultation, and (3) average lengths of stay in ICUs or CCUs. Hospitals were excluded from the sections of the analysis involving ICU, CCU, and consultation variables if they did not report on these variables in all 5 years. In the analysis of ICU and CCU use, 424 and 373 hospitals, respectively, were used. Hospitals were included in the determination of the average length of stay in ICUs and CCUs if they indicated that their patients had used these units and they recorded a length of stay in these units for all 5 years. Using this decision rule, 393 hospitals were used in the ICU length of stay analysis, and 344 hospitals were used in the CCU length of stay calculations. In determining the proportion of discharges with consultations, data from 594 hospitals were included.

The second source of data was the computer tape from the Annual Survey of Hospitals sponsored by the AHA. These data were necessary to provide hospital-specific information for the analysis, such as teaching status, bed size, region, and ownership. Hospitals were classified as major teaching if they had a resident/bed ratio of .25 or greater. Minor teaching hospitals have at least one resident, but a resident/bed ratio of less than .25. In terms of ownership, hospitals were classified as either not-for-profit, for-profit, or governmental.

The comparison of the PAS panel of hospitals with the universe of all short-term general non-Federal hospitals in the U.S. is shown in Table 4-52. While the sample is, in general, representative, there is a slight overrepresentation of minor teaching hospitals. Moreover, private not-for-profit hospitals are slightly overrepresented, while the Government and for-profit sectors are slightly underrepresented. In terms of bed size and region, the hospitals in the PAS cohort tend to be larger, with proportionately more from the New England and East North Central regions and fewer hospitals from the South.

Table 4-52
COMPARISON OF PAS PANEL OF HOSPITALS WITH UNIVERSE OF SHORT-TERM NON-FEDERAL COMMUNITY HOSPITALS FROM NON-WAIVERED STATES, 1983

ITEM	NUMBER OF PAS HOSPITALS	UNIVERSE	PAS HOSPITAL AS A PERCENT OF UNIVERSE
Total	729	5161	14.1%
Teaching Status			
No Teaching (no residents)	593	4471	13.3%
Minor Teaching (< .25 residents/bed)	120	599	20.0%
Major Teaching (≥ .25 residents/bed)	16	91	17.6%
Control			
Government	154	1637	9.4%
Private not-for-profit	535	2799	19.1%
Investor-Owned	40	725	5.5%
Number of Beds			
1-99	296	2676	11.1%
100-199	166	1098	15.1%
200-299	104	568	18.3%
300-499	119	565	21.1%
500+	44	254	17.3%
Division (Geographic Area)			
1 New England	42	135	31.1%
2 Middle Atlantic	15	224	6.7%
3 South Atlantic	141	752	18.8%
4 East North Central	251	886	28.3%
5 East South Central	15	494	3.0%
6 West North Central	71	791	9.0%
7 West South Central	32	828	3.9%
8 Mountain	57	364	15.7%
9 Pacific	105	687	15.3%

The 650,596 discharges represent a 10 percent patient sample from these 729 hospitals. An edit check was performed to exclude any cases with a length of stay greater than 365 days. Additionally, cases were excluded with a length of stay of zero, except those that died in the hospital or were transferred to another short-term hospital. Obvious coding errors, such as surgical cases with post-operative stays of less than zero were also excluded.

The PAS patient records reported age, sex, principal source of payment, as well as diagnoses, procedures, discharge status, and disposition. Several calculated variables were used in the analysis. Length of stay was calculated from admission and discharge dates, DRGs were determined by using the Health Systems International DRG grouper program, and the post-operative length of stay was determined by subtracting pre-operative length of stay (of the principal procedure) from the total length of stay.

Three measures of severity were used in the analysis: a body systems count and two comorbidity/complication measures. The body systems measure, developed by CPHA, is a count of the number of body systems implicated in a patient's illness (see Mendenhall, 1984). This is accomplished by treating each of the patient's secondary diagnoses as if it were the principal diagnosis and assigning a MDC to each of those secondary diagnoses. The number of different MDCs are then counted, with the count serving as a measure of the number of different body systems involved. The comorbidity/complication measures are based upon whether or not the patient's abstract had secondary diagnoses included on the HCFA list of complications and comorbidities (see Health Systems International, 1983). One measure is the percentage of cases with at least one secondary diagnosis indicating

comorbidity or complications. The other measure is the average number of complications or comorbidities for those patients with at least one such condition recorded.

For purposes of this analysis Medicare patients have been defined as those patients 65 years of age and older or where Medicare is designated as the principal source of payment on the hospital abstract; non-Medicare patients are those under 65 where payment sources other than Medicare are given on the hospital abstract.

Methods and Data

In order to evaluate the effects of PPS actual data have been compared to the best possible estimates of what would have happened if PPS had not been implemented in 1983. This is a difficult task since PPS was not introduced as an experiment with a control group. Instead, all States except those with waivers were included. Waivered States were not used as a control group because it was judged that these States already had regulatory environments that were quite different from the non-waivered States. It is possible to use non-Medicare patients as a comparison group since the majority of non-Medicare patients were reimbursed on a basis other than PPS in 1984. Therefore, non-Medicare data are used in this study to help gain a better understanding of the effects of PPS.

One problem with developing the forecasting approach was the limited PAS data available for constructing trends. The health care field has undergone radical changes within the last decade emanating from the various efforts by regulators and third party payers to control the rapidly increasing health care costs.

Moreover, recent developments in technology have radically changed the ways that certain cases are treated. For example, computerized axial tomography (CAT) scanners and outpatient surgery have changed the diagnostic process and treatments for certain problems in dramatic ways. Because of these changes, projections from the recent past are preferred over historical data. Therefore, the 4 years preceding the introduction of PPS were used in the projections for this analysis. While this provides a limited number of data points to be used in the forecasting technique, it is clear that these are the most relevant years for predicting what would have happened without PPS.

A linear forecasting method was used to estimate what would have happened without PPS. For each statistic, a linear model was fitted to the 1980-1983 data. Fitting was done by ordinary unweighted least squares. By extrapolation, the model yields 1984 estimates for each of the variables studied, from which 95 percent confidence intervals were constructed. While many forecasting techniques weight recent observations more heavily than earlier ones, the unweighted approach was chosen here since it is quite likely that the anticipation of (or preparation for) PPS may have caused a shift in 1983 in the same direction as the larger (PPS) shifts in 1984. In this situation, a weighted model is inappropriate. Instead, each pre-PPS year (1980-1983) is assigned an equal weight.

A rather limited measure of readmissions is used in this study. Nevertheless, any shifts in trends should be detectable. Only readmissions to the same hospitals during the same quarter of the observation were included. Readmission calculations were based on the entire set of PAS records for the third quarters of 1980-1984 rather than the 10 percent sample. Newborns and patients who were

discharged alive on the same day of admission were excluded. There were 371 hospitals that used unit numbering systems that allowed records to be matched. Records were matched within each of these hospitals for each year. The number of readmissions was summed across the 371 hospitals and then divided by the number of discharges from these hospitals.

Utilization Trends

Past utilization trends (from 1980 to 1983) for both Medicare and non-Medicare admissions are displayed in Table 4-53. Also, projected figures for 1984 are given using a linear forecasting method, and the observed values for 1984 are compared to the ranges established from the linear projections.

It is clear that the total number of discharges has decreased in 1984, both for the Medicare and non-Medicare cases. Although Medicare discharges had been rising from 1980-1983, the observed number for 1984 is significantly different from the projected value with a 5.4 percent drop in admissions between 1983 and 1984. Non-Medicare admissions, which had been declining from 1980-1983, dropped 5.3 percent from 1980 to 1983; however, this decrease was consistent with the projected range.

The overall (surgical and nonsurgical) average lengths of stay for both Medicare and non-Medicare cases dropped in 1984. Medicare cases had an average length of of stay that was significantly shorter than the projected with a 1.12 day drop in average length of stay from 1983 to 1984. The non-Medicare reduction, which was only .24 days, was not significantly different from the projected figure.

Table 4-53: Summary of Trends in Utilization, 1980-1984[1]

	Past Trends				Predicted	95% Confidence Interval		Observed
	1980	1981	1982	1983	Value 1984	Low	High	Value 1984
Total Discharges								
Medicare	31,685	35,792	35,155	36,651	38,386	35,918	40,854	34,663*
Non-Medicare	101,425	100,541	96,528	93,041	90,592	83,199	97,986	88,115
Total Average Length of Stay (Days) for All Cases, (Medical and Surgical, and Other)								
Medicare	10.65	10.39	10.09	9.68	9.40	9.03	9.77	8.56*
Non-Medicare	5.78	5.61	5.51	5.36	5.23	5.09	5.36	5.12	
Average Length of Stay (Days) for Surgical Cases Only								
Medicare	11.78	11.47	11.11	10.50	10.17	9.41	10.92	9.39*
Non-Medicare	6.09	5.93	5.84	5.68	5.55	5.40	5.71	5.40*
Average Preoperative Length of Stay (Days) for Surgical Cases Only								
Medicare	3.41	3.31	3.26	3.07	3.00	2.70	3.29	2.67*
Non-Medicare	1.65	1.65	1.60	1.55	1.53	1.39	1.66	1.42
Average Postoperative Length of Stay (Days) for Surgical Cases Only								
Medicare	8.37	8.15	7.84	7.43	7.17	6.71	7.62	6.72
Non-Medicare	4.44	4.28	4.25	4.14	4.05	3.79	4.30	3.98
Percent of Patients Using ICUs[2]								
Medicare	8.98	9.35	9.42	9.61	9.83	9.20	10.46	8.66*
Non-Medicare	3.74	3.83	3.88	3.80	3.87	3.45	4.29	3.47
ICU Average Length of Stay (Days)[3]								
Medicare	4.10	4.08	3.91	4.20	4.11	3.11	5.10	3.98
Non-Medicare	3.68	3.49	3.47	3.71	3.61	2.57	4.64	3.46
Percent of Patients in CCUs[4]								
Medicare	9.01	9.14	9.13	9.46	9.52	8.81	10.23	8.41*
Non-Medicare	2.53	2.71	2.68	2.85	2.93	2.48	3.37	2.68
CCU Average Length of Stay (Days)[5]								
Medicare	3.78	3.74	3.90	3.59	3.65	2.68	4.62	3.34
Non-Medicare	3.34	3.28	3.25	3.05	3.01	2.61	3.41	2.85
Percent of Cases with at Least One Consultation[6] While Hospitalized								
Medicare	38.31	39.86	40.81	42.04	41.29	42.07	44.51	42.67
Non-Medicare	20.33	20.67	21.82	22.15	22.90	21.14	24.65	21.56

*Significance: P<.05

[1]Source: 10 percent sample of Medicare and non-Medicare PAS hospital admissions, third quarters 1980-1984, U.S. non-waivered short-term non-federal hospitals.

[2]Only includes the 424 hospitals that reported this item to CPHA in all five years.

[3]Only includes the 393 hospitals that reported this item to CPHA in all five years.

[4]Only includes the 373 hospitals that reported this item to CPHA in all five years.

[5]Only includes the 344 hospitals that reported this item to CPHA in all five years.

[6]Only includes the 596 hospitals that reported this item to CPHA in all five years.

The average length of stay for surgical cases dropped significantly in 1984, both for Medicare and non-Medicare cases. This was due to reductions in both the pre-operative and post-operative periods although only the Medicare pre-operative average length of stay reduction was significantly different from the projected figure.

Table 4-53 also shows the changes in ICU and CCU use during 1980-1984. It should be noted that not all hospitals report on the use of ICUs and CCUs to CPHA. These figures were calculated using only those hospitals that reported on ICU and CCU use for all 5 of these years. It is evident from Table 4-53 that the percent of patients using ICUs and CCUs dropped both for Medicare and non-Medicare patients in 1984. However, only the Medicare reductions are statistically significant. Also, ICU and CCU average lengths of stay dropped slightly for both Medicare and non-Medicare patients in 1984, but these reductions were not statistically significant.

The percentage of cases with at least one consultation during the hospital stay rose slightly for both Medicare and non-Medicare patients in 1984. These figures are consistent with past trends.

Table 4-53 also displays changes in the average pre-operative and post-operative lengths of stay and total surgical length of stay for both Medicare and non-Medicare patients. While non-Medicare surgical lengths of stay declined slightly from 1980 to 1984, larger downward shifts were occurring for Medicare

patients during these years. Relatively larger drops in both pre-operative length of stay and post-operative length of stay occurred for Medicare patients in 1984 after PPS was introduced.

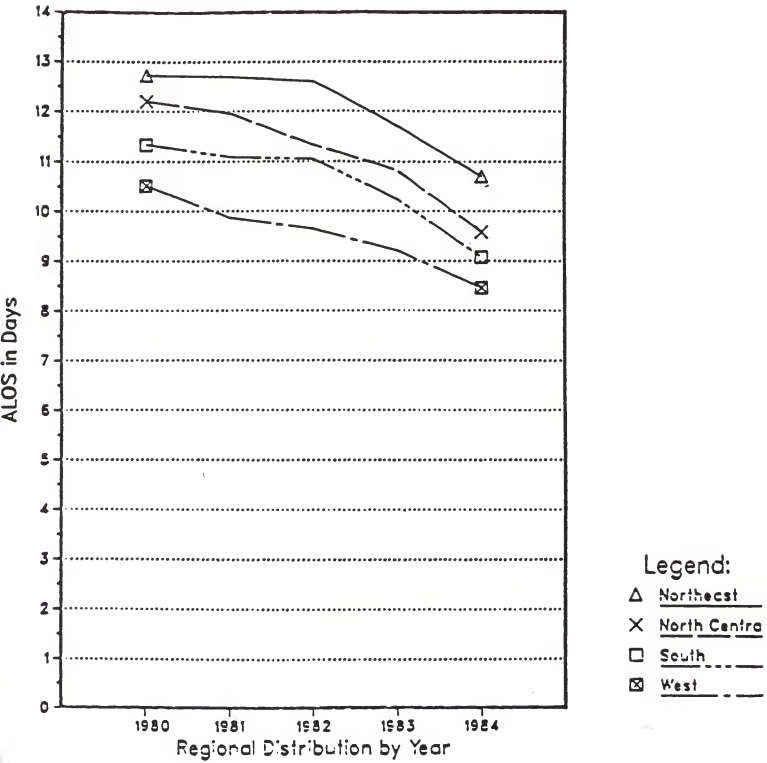
Figure 4.7 shows data on geographic variations in surgical length of stay under PPS. As noted earlier, total pre-operative and post-operative lengths of stay decreased under PPS for Medicare surgical patients. These findings are consistent in all four geographic regions studied: Northeast, North Central, South, and West. Although the lengths of stay in 1980 differed considerably by region (with longest stays in the Northeast and shortest stays in the West) similar downward shifts occurred in all regions with substantial drops in 1984.

Patient Disposition

Changes in patient disposition (place of discharge) are shown in Table 4-54. Significant changes occurred in 1984 in the proportions of patients discharged home to self-care and those discharged home with home health care for Medicare patients. While the proportion discharged to self-care dropped over 3 percent, the proportion discharged to home with home health care rose almost 2 percent. This suggests that the shorter Medicare stays are being supplemented with more use of HHAs for post-discharge care. Also, the proportion transferred to other types of facilities (mental, rehabilitation, etc.) rose significantly (.44 percent) in 1984. This may mean that more patients are being discharged to units that are not covered by PPS at this time.

Figure 4.7

Regional Changes in Total Length of Stay for Medicare Surgical Cases: 1980–1984



Mortality rates are also shown on Table 4-54 under the heading "Died in Hospital." Medicare inhospital mortality rates declined slightly in 1984 when compared with past trends. By contrast, non-Medicare mortality rates rose slightly. However, these changes are not statistically significant. Further analysis of Medicare mortality rates by hospital ownership (not shown on Table 4-54) revealed that the death rates declined by .21 percentage points from 1983 to 1984 for the not-for-profit hospitals and by .02 percentage points in the governmental hospitals. However, the mortality rate did not decline in the for-profit hospitals in 1984. It should be noted, however, that only 40 for-profit hospitals are represented in this data base.

Information on readmissions is also shown in Table 4-54. This is a very limited definition of readmissions, as explained earlier. Using this definition, it is apparent that the readmission rate did not increase significantly in 1984 following the introduction of PPS.

Severity

Table 4-55 has comparative trends for three different measures of severity: (1) the percentage of patients with at least one comorbidity/complication, (2) the average number of comorbidities or complications if at least one was recorded, and (3) a body systems count. Since the existence of comorbidities/complications on the HCFA list often moves a patient into a more heavily weighted (and higher paying) DRG, there is an incentive for hospitals to carefully code this information. The body systems count, however, is a different type of severity measure. Since there is no financial advantage to coding additional body systems, this system

Table 4-54: Changes in Place of Discharge, 1980-1984

Percent of Patients Discharged to Various Locations	Past Trends 1980	1981	1982	1983	Predicted Value 1984	95 Percent Confidence Interval Low	High	Observed Value 1984
Home-Self Care								
Medicare	84.20	83.95	84.16	83.08	83.06	80.32	85.80	79.85*
Non-Medicare	97.13	97.14	96.93	96.76	96.66	96.15	97.18	96.34
Home-Home Health Care								
Medicare	2.72	2.88	3.06	3.54	3.71	2.88	4.54	5.37*
Non-Medicare	.33	.38	.37	.45	.47	.29	.65	.65*
Skilled Nursing Facility								
Medicare	8.20	7.79	7.44	7.75	7.37	5.52	9.22	8.53
Non-Medicare	.20	.19	.18	.21	.20	.09	.31	.21
Intermediate Care Facility								
Medicare	2.25	2.43	2.42	2.54	2.63	2.25	3.00	2.84
Non-Medicare	.05	.05	.08	.07	.09	.01	.16	.08
Other Short-Term Hospital								
Medicare	1.47	1.70	1.82	1.82	2.00	1.44	2.55	1.76
Non-Medicare	1.12	1.11	1.24	1.31	1.37	1.08	1.66	1.40
Discharged Against Medical Advice								
Medicare	.28	.32	.20	.24	.20	-.14	.54	.18
Non-Medicare	.70	.68	.71	.63	.64	.41	.86	.67
Died in Hospital								
Medicare	6.76	6.55	6.44	6.20	6.04	5.78	6.30	6.10
Non-Medicare	.84	.84	.85	.80	.81	.66	.95	.88
Transferred to Other Facilities								
Medicare	.87	.93	.91	1.02	1.04	.78	1.30	1.46*
Non-Medicare	.47	.46	.49	.57	.58	.36	.80	.66
% Readmissions								
Medicare	12.66	13.59	13.60	13.75	13.98	11.35	16.60	14.66
Non-Medicare	6.03	6.45	7.07	6.60	7.04	4.38	9.69	7.44

*Significance: P<.05

Source: 10 percent sample of Medicare and non-Medicare PAS hospital admissions, third quarters, 1980-1984, U.S. non-waivered short-term non-federal hospitals.

Table 4-55: Changes in Two Different Measures of Severity, 1980-1984

Measures of Severity	Past Trends: 1980	1981	1982	1983	Predicted Value 1984	95 Percent Confidence Interval Low	High	Observed Value 1984
Percent of cases with at least one secondary diagnosis indicating comorbidity and/or complications								
Medicare	45.55	46.54	48.01	52.93	54.16	44.18	64.14	60.14
Non-Medicare	17.51	18.23	19.55	21.66	22.68	19.33	26.03	23.77
Average number of complications and comorbidities for those patients with at least one recorded								
Medicare	1.61	1.64	1.67	1.77	1.80	1.62	1.98	1.95
Non-Medicare	1.36	1.38	1.39	1.44	1.46	1.37	1.55	1.51
Average number of body systems included in recorded diagnoses								
Medicare	2.43	2.45	2.51	2.69	2.73	2.34	3.12	2.86
Non-Medicare	1.47	1.49	1.51	1.57	1.59	1.49	1.70	1.59

Source: 10 percent sample of Medicare and non-Medicare PAS hospital admissions, third quarters, 1980-1984 U.S. non-waivered short-term non-federal hospitals.

provides another measure of severity which is at least partially independent of the comorbidity/complications measure.

Table 4-55 shows that all these measures had been increasing steadily from 1980 -1983, both for Medicare and non-Medicare patients. Increases continued in 1984, but these increases were all consistent with past trends. None of the 1984 changes was statistically significant for these three measures of severity. It should be noted that the proportion of patients with at least one comorbidity or complication was slightly higher in the West. (Not shown here.) Thus, the lower average lengths of stay in the West are not explained by a less complicated case mix.

The severity data based upon comorbidities/complications presented in Table 4-55 should be interpreted in light of possible changes in hospital coding practices induced by PPS in 1984. PPS provides hospitals with an incentive to code diagnostic and procedures data more completely and accurately. These potential changes could, in turn, artificially inflate the severity measures presented here. Actual severity values for 1984 may be significantly lower than those shown.

Discussion

The purpose of the study underlying this section was to assess some of the immediate utilization and quality of care changes that occurred in hospitals in the first year of PPS.

It was predictable that hospitals would respond to PPS by eliminating some of the "slack" or inefficiency in the system for Medicare patients. This section has shown that, in addition to overall average length of stay, ICU use, CCU use, surgical length of stay, and pre-operative length of stay all declined significantly in 1984, i.e., more than would be predicted on the basis of past trends. These reductions may reflect efficiencies brought about by physician practice patterns (e.g.,ordering tests and planning for patient care) or hospital management efficiency, such as improving turnaround times for diagnostic tests.

While these shorter lengths of stay were predictable, the drop in Medicare admissions was somewhat less predictable. In fact, Congress in 1983 was concerned that admissions might actually increase under PPS, as hospitals tried to fill the beds that were vacant due to decreasing lengths of stay. It is not entirely clear why admissions decreased so steeply in 1984. Among the possible explanations for this drop are the following: use of new technologies allowing a greater proportion of cases to be treated on an outpatient basis, a more conservative attitude toward surgical interventions and the use of "second opinion" programs, and increased use of ambulatory surgical programs. Many minor procedures (biopsies, cataracts, etc.) are now being done on an ambulatory basis throughout many parts of the country in response to the recent pressure from many third party payers to develop outpatient surgery programs.

Another possible explanation for this decline in admissions is that the uncertainty generated by PPS created a certain amount of anxiety among hospitals and physicians. A heightened awareness of costs and admission patterns may have

helped to create a downward shift in hospital admissions. This shift may be either temporary (a reaction to the uncertainty of PPS) or part of a longer-term trend.

The proportion of Medicare patients in 1984 with at least one consultation increased slightly and is consistent with past trends. This may be interpreted in a positive sense: physicians are not "cutting corners" to get Medicare patients out of the hospital more quickly, at least in terms of consultations. As expected, the 1984 rate of consultations for Medicare patients was considerably higher in major teaching hospitals compared to nonteaching institutions.

The results on discharge locations are as expected. Most analysts predicted that hospitals would use HHAs more frequently as lengths of stay decreased (for example, see Midyette and Loup, 1983). The upward trend in discharges to HHA care indicates that the families of Medicare patients are also taking more responsibility in caring for their relatives. The quality implications of this change need to be monitored carefully. Further, evaluations of post-discharge health status and health care are needed. It is somewhat surprising that discharges to SNFs have not increased significantly in 1984. This may be due to a temporary lag in the supply of SNFs. If so, then this pattern of discharges may change in subsequent years of PPS if the supply of SNFs increases.

The changes in mortality rates need further monitoring and more indepth analysis. While it is somewhat reassuring to note that the overall inhospital mortality rate declined in 1984, several interpretations are possible. In some instances, elderly patients who are terminally ill may be sent home and allowed to

die without heroic interventions. Hospice care is becoming available in many parts of the country, and this may be aiding patients in making decisions for less hospital care during terminal illness. (See section entitled "Methodological Issues in the Evaluation of Mortality Rates".)

The possibility that severely ill patients are being sent to other locations so that hospitals will not lose money by keeping these patients for long periods of time has been raised. While this is possible, there is no evidence to demonstrate that this is occurring. On the contrary, rates of discharges to SNFs and other short-term hospitals have not increased significantly in 1984. Thus, there is no evidence of "dumping" difficult or costly cases to SNFs or other short-term hospitals.

There are several limitations to the analysis presented in this section. Without a randomized design and without a control group it is difficult to separate historical trends (including changes in technology and changes in the practice of medicine) from the effects of PPS. An attempt has been made to overcome this problem to some extent by projecting time series trends and by using non-Medicare patients as a comparison group. While these methods do not solve the problem completely, they are useful in separating the effects of PPS from historical changes. It is evident from the findings presented in this section that many of the changes in Medicare utilization in 1984 were also accompanied by changes in the same direction (though lower in magnitude) in the non-Medicare population. Thus, PPS may have had a "spillover" effect on other patients or relatively new efforts by other payers (ambulatory surgery initiatives, second opinion programs, utilization review requirements, etc.) may have enhanced the effects of PPS on

Medicare patients. It is clear that the Medicare and non-Medicare trends are related, but is not possible to distinguish cause and effect.

Also, it is difficult to separate out the effects of PPS from the effects of resource availability constraints. For example, the fact that discharges to SNFs did not increase significantly following the introduction of PPS may be due to limitations in the supply of nursing home beds even though hospitals would prefer to increase their transfers to SNFs. Moreover, post-discharge mortality figures were not available for this analysis to assess health outcomes.

Another issue of interest is the patterns of geographic variations in average length of stay for surgical patients, pre-operative length of stay, and post-operative length of stay. Regional differences have been documented for many years. Although the quality implications of these differences are not clearly understood, there is obviously some limit on how short stays can be while still providing good quality care. When noting the relatively long lengths of stay in the Northeastern States, compared to the very short stays in the Western States in the pre-PPS time period, one might have come to the conclusion that the short stays in the Western States represented some sort of "limit," while the figures from the Northeastern States represented "slack" in the system. However, the findings from this analysis for 1984 show that the average length of stay for surgical patients, the average pre-operative length of stay, and the average post-operative length of stay all were reduced further, even in the Western States, under PPS. Since the proportion of cases with at least one comorbidity or complication was slightly higher in the Western States, the Medicare cases treated in the West are likely to have been at least as ill as all cases treated nationally. This raises important

questions about how much "slack" there really is in the system. Why do these geographic variations exist? How short can stays become without jeopardizing the quality of care? These issues are clearly beyond the scope of this study.

Conclusions

The purpose of this section has been to present preliminary findings on the early effects of PPS as determined by CPHA. In particular, changes in the utilization of hospital care and in inpatient mortality and readmission rates in the first year of PPS, 1984, were examined. This analysis was based upon the PAS data maintained by CPHA together with the Annual Survey of Hospitals (AHA) data on hospital characteristics. A cohort of 729 U.S. short-term general hospitals was selected, and a 10 percent sample was then chosen from the third quarter of each year from 1980-1984.

A linear forecasting model was used to project 1984 figures using trends based on the years 1980-1983. The model was used to establish a confidence interval around a projected value for 1984. Then, the 1984 data were analyzed in relation to the confidence interval.

Results indicate that the total number of Medicare hospital discharges dropped significantly in 1984, the year following the introduction of PPS. Also, all average length of stay measures decreased for Medicare patients. Overall length of stay, length of stay for surgical cases, and pre-operative length of stay all decreased significantly for Medicare cases in 1984. Significant decreases were also

observed in 1984 for the proportion of Medicare patients using ICUs and CCUs. Regional differences in length of stay did not diminish in 1984.

Overall, it appears that PPS was effective in reducing some of the "slack" or inefficiency in hospitals. The CPHA quality indicators, while general in nature, show no evidence of problems in 1984. Inhospital consultation rates, inhospital mortality rates, and readmission rates are all consistent with past trends. Moreover, there is no evidence of "dumping" undesirable patients into SNFs or other short-term hospitals.

It is clear that there is a need for closer study of certain DRGs which are believed to be very sensitive to reductions in length of stay. The changes in clinical patterns of physicians must be examined carefully in order to evaluate the clinical significance of using fewer resources to treat certain types of patients. This work is in progress at CPHA. CPHA will also be studying the relationship between changes in hospital efficiency under PPS and concurrent changes in quality of care.

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Chapter 5

IMPACT ON OTHER PAYERS FOR INPATIENT HOSPITAL SERVICES

Overview

The Medicare program accounts for over one-quarter of all expenditures on hospital care in the United States, clearly establishing it as the largest single payer for inpatient hospital services. Given the dominant role played by Medicare and the dramatic change in the way that Medicare pays for inpatient hospital services under PPS, it would not be unreasonable to expect that the entire hospital payment environment might be altered by the new system. Among those most likely to be affected by such a change are those who pay the bulk of the remaining portion of the nation's hospital bill—primarily, State Medicaid programs, Blue Cross and Blue Shield plans, and commercial insurers. The purpose of this chapter is to describe and analyze evidence on the impact of PPS on these other payers for inpatient hospital services.

Matrix Study Issues

The issues to be addressed in this chapter are described in Table 5.1, which draws from the PPS Study Issues Matrix presented in Chapter 1. Table 5.1 lists a set of hypothesized impacts of PPS on other payers for inpatient hospital services, expressed in terms of economic considerations and factors related to the quality of care and access to care, including both anticipated benefits of the new system (i.e., positive effects that the system was designed to elicit) and other potential consequences. The purpose of the PPS Study Issues Matrix is to provide a

Table 5.1
PPS STUDY ISSUES:
HYPOTHETICAL IMPACT ON OTHER PAYERS

Economic Impact	
—Anticipated Benefits:	• Rapid diffusion of prospective payment and other innovative payment methodologies. • Increased cost consciousness among all payers and providers, resulting in cost savings for payers, providers, and consumers.
—Other Potential Consequences:	• Potential shifting of cost burden to other payers for hospital inpatient services, with resulting increases in health insurance premiums and/or reductions in benefits. • Increase in the economic consequences of uncompensated care, as the burden for payment of that care is shifted to other payers and/or providers.
Impact on the Quality of Care	
—Anticipated Benefits:	• Improved coordination of health care treatment, payment, and coverage.
—Other Potential Consequences:	• Competing incentives to health care providers treating patients with different types of coverage.
Impact on Access to Care	
—Anticipated Benefits:	• Reduced health care charges and insurance premiums. • Improved coordination of health care treatment, payment, and coverage.
—Other Potential Consequences:	• Decreased coverage of indigent patients and other uninsured or underinsured patients who are unable to pay for health care.

framework for the description and analysis presented in this chapter. For those study areas in which it is not yet possible to adequately analyze the issues empirically, the matrix indicates the most fruitful directions for future research.

Organization of the Chapter

This chapter begins with a discussion of the data used in the analysis and a brief overview of sources of payment for hospital care. It then discusses, in turn, observed changes in State Medicaid programs, Blue Cross and Blue Shield plans, commercial insurers, and alternative payment systems such as health maintenance organizations (HMOs). The possible indirect effect of PPS on the development of alternative cost-containment strategies is also discussed in this chapter.

Data Sources

The data used in this chapter come from a number of sources. Data from HCFA's Office of the Actuary provide the basic background information on the markets for health care and hospital services, market shares, and Government expenditures. A special study conducted for HCFA at the Brandeis University Health Policy Center (Singer, 1985) provides data on the impact of Medicare PPS on the State Medicaid programs. Data collected by the Blue Cross and Blue Shield Association and analyzed in a special study for HCFA (Scheffler and Gibbs, 1986) provide the basis for the review of the experience of the Blue Cross and Blue Shield plans.

Sources of Payment for Hospital Care

Total personal health care expenditures for hospital care increased by 6.1 percent in 1984, as shown in Table 5.2. The share of total hospital expenditures accounted for by private health insurers decreased by 1.1 percentage points (from 38.0 to 36.9 percent), while Medicare's share increased by 0.9 percentage points (from 27.2 to 28.1 percent). Other payers' shares remained essentially unchanged.

The increase in total hospital expenditures in 1984 largely reflected an increase of 8.4 percent in Government expenditures on hospital care (which accounted for 53.4 percent of the total), offset by a much smaller increase of 2.8 percent for private health insurance expenditures (which accounted for 36.9 percent of the total). Despite the implementation of PPS, Medicare expenditures rose more rapidly than any category of payments for hospital care except the State share of Medicaid. In particular, Medicare expenditures increased at more than three times the rate of private health insurance payments and at double the rate of all expenditures other than Medicare. This strongly suggests that, due either to private sector cost containment activities or hospital pricing behavior, Medicare and other Government payers' costs were not shifted to private insurers during the first year of PPS.

Medicaid Programs

Medicaid is a health care program for the poor that is run by the individual States and jointly financed by them and the Federal Government. It differs by State in the share of program cost born by the Federal Government and in certain details of program operations, such as rules for eligibility and services covered. The Omnibus Budget Reconciliation Act of 1981 (OBRA) permitted the States considerable discretion in the details of program design, including choice of payment

Table 5.2
PERSONAL HEALTH CARE EXPENDITURES FOR HOSPITAL CARE
BY SOURCE OF FUNDS
1983 AND 1984

	1983		1984		Pct. Change	
	Amt.	Pct. Share	Share	Pct. Share	Amt.	Pct. Share
Total	148.8	100.0%	157.9	100.0%	9.1	6.1%
Direct Payments	12.8	8.6	13.7	8.7	0.9	7.0
Third-Party Payments	136.1	91.4	144.2	91.3	8.1	6.0
Private Health Insurance	56.6	38.0	58.2	36.9	1.6	2.8
Philanthropy and Industrial In-plant	1.6	1.1	1.6	1.0	0.0	0.0
Government	77.8	52.3	84.3	53.4	6.5	8.4
Federal	60.6	40.7	65.6	41.5	5.0	8.3
Medicare	40.5	27.2	44.4	28.1	3.9	9.6
Medicaid	6.9	4.6	7.4	4.7	0.5	7.2
Other	13.1	8.8	13.8	8.7	0.7	5.3
State and Local	17.2	11.6	18.7	11.8	1.5	8.7
Medicaid	6.0	4.0	6.7	4.2	0.7	11.7
Other	11.3	7.6	12.1	7.7	0.8	7.1
Total Medicaid	12.9	8.7	14.1	8.9	1.2	9.3
Total Non-Medicare	108.3	72.8	113.5	71.9	5.2	4.8

Source: Levit, et al. (1985), p. 28-29.

methodologies. Although increased discretion, as well as fiscal pressures on the State governments, no doubt were major stimuli in the changes that have occurred in Medicaid payment methods, Medicare's PPS may have also stimulated some of the new movement toward prospective payment, and certainly provided a model used by several States to revamp their Medicaid systems.

Payment Methods

Since 1981, an increasing number of States have abandoned the traditional Medicare principles of cost-based retrospective reimbursement that had, up to that time, guided the operation of most Medicaid systems. Many States have adopted prospective payment systems for hospital inpatient care. By June 1983, 20 States had adopted prospective Medicaid payment systems. By September 1985, this number had increased to 34, and, by December 1986, 41 States are expected to have adopted prospective systems.

Of the 34 States with prospective systems in September 1985, nine models can be identified, depending on the unit of payment and method of rate setting, as shown in Table 5.3:

- Twenty States set rates on a provider-specific basis. Of these:
  - One requires competitive bids to set capitation payments;
  - Two negotiate budgets;
  - Three negotiate per diem rates;
  - Three States set budgets;
  - Three States set payments per case; and
  - Eight States set per diem rates.

Table 5.3
CATALOGUE OF STATE MEDICAID SYSTEMS WITH PROSPECTIVE PAYMENT

	Payment System Model			
		Provider Specific		Peer Group Based
Unit of Payment	Government Set	Negotiated	Competitively Bid	Government Set
Per Capita			Arizona	
Budget System	Alaska Maine Massachusetts	Rhode Island District of Columbia		
Per Admission/ Discharge	Maryland Minnesota* Oregon*			Nevada
Per Diem	Colorado* Iowa Florida Kansas Nebraska North Carolina Oklahoma Tennessee	California Illinois Vermont		Alabama Arkansas Kentucky Miss. New York** Virginia
Per DRG				Michigan New Jersey Ohio Penn. So. Dakota Utah Washington

*DRG system is planned.
**DRG system under discussion.

Source: Singer (1985).

- Fourteen States set rates for peer groups of hospitals. Of these:
  - One sets payments per case;
  - Six set per diem rates; and
  - Seven set payments per DRG.

The group of seven States using DRGs for Medicaid payments in September 1985 will probably have increased to 16 by December 1986. Thus, it is clear that DRG-based payment is the predominant approach in new prospective systems.

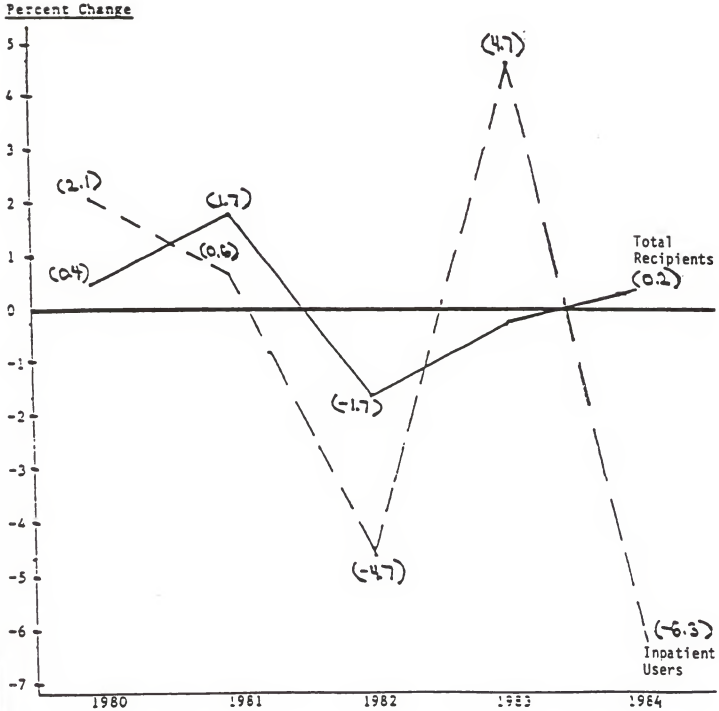
Many of the DRG-based State prospective payment systems adopted after the implementation of the Medicare PPS are modeled on the Federal system in one way or another. However, most of the seven existing systems differ from PPS in significant respects, such as in the calculation of cost weights and in outlier definitions.

Utilization and Payments

As shown in Figure 5.1, Medicaid utilization patterns shifted in FY 1984, with the number of Medicaid recipients using general hospital inpatient services falling by 232,000—or 6.3 percent--in a single year. This was the largest such decrease in over a decade, and it occurred while the total number of recipients increased slightly (0.2 percent).

Medicaid vendor payments increased at a slower rate than in previous years, and reflected the shift away from inpatient care. Payments for all services

Trends in Medicaid Recipient and Inpatient Hospital User Counts



increased by 4.6 percent in FY 1984, while payments for general hospital inpatient services alone increased by only 0.4 percent. As was shown in Table 5.2, the share of Medicaid payments for all forms of hospital services borne by the States increased somewhat more rapidly than the Federal share in calendar year 1984, with the State share increasing by 11.7 percent and the Federal share by 7.2 percent.

The Blue Cross and Blue Shield Plans

Blue Cross and Blue Shield plans provide private health insurance coverage for 75 million persons—approximately 31 percent of the total United States population. These plans have experienced significant cost and utilization changes in the period since the implementation of PPS. It is not possible to establish a definitive causal link between the implementation of PPS and the experience of the Blue Cross and Blue Shield plans; however, we may hypothesize several possible routes by which Medicare changes could have had an impact on various private insurers.

One hypothesis is that changes in hospital management and physician behavior, initiated to deal with the cost containment pressures of PPS, may have produced cost containment effects for non-Medicare patients, as well. Hospitals and physicians, unwilling or unable to distinguish between patients according to source of payment, may have become more cost conscious in treating all patients.

A second hypothesis is that private insurers, such as Blue Cross and employers who pay for group health insurance, may have acted to counter hospital pricing behavior that could raise their costs. They may have become concerned that hospitals, under pressure from Medicare's PPS, might seek to shift costs of Medicare patients to them.

Anecdotal evidence can be found to support either or both of the above

hypotheses. With reductions in hospital costs of the magnitude of those reported in Chapter 3, it is unlikely that hospitals could focus their cost-containment efforts so narrowly on Medicare patients. On the other hand, whether due to fears of cost-shifting or simply as a response to an increase in hospital prices of approximately nine percent per year from 1980 through 1984, private payers also undertook a variety of cost-containment initiatives in the early 1980's. In the period shortly before and after the implementation of PPS, Blue Cross plans initiated a number of cost management efforts, such as second surgical opinion programs, encouragement of ambulatory surgery, and preferred provider arrangements, as well as expanding Blue Cross-sponsored HMOs. Also striking, however, has been the move to prospective payment by several Blue Cross plans.

Payment Methods

By late 1985, 10 Blue Cross plans had designed their own DRG-based reimbursement systems, which they had either implemented or were planning to implement. These innovative systems include plan-wide DRG systems, pilot programs, and preferred provider organizations (PPOs) that pay on a DRG basis. They include:

- Four plans that have developed DRG-based payment systems that will cover all, or virtually all, participating hospitals. These plans are in Kansas, Eastern Missouri, Oklahoma, and Arizona.

- Four plans that have negotiated or are negotiating with one or more hospitals to pay on a DRG basis in pilot programs, in order to determine whether expansion of the DRG-based systems is desirable. These plans are in Mississippi, Northeastern Pennsylvania, Nebraska, and Oregon.

- Two plans that have negotiated PPO contracts with specific hospitals, which will be the primary sources of care for subscribers in return for reduced charges paid on a DRG basis. These plans are in Florida and Michigan.

All of these programs differ from Medicare's PPS in one or more significant ways, including the treatment of outliers, the definition of hospital peer groups, the method used for annual updates, and payment for transfers. However, they all share with PPS the principle of prospectivity and the use of DRGs as the method of patient classification for determining payment.

Utilization

Table 5.4 shows that, between 1983 and 1985, the Blue Cross/Blue Shield share of the market for private health insurance fell from 34.3 to 31.1 percent, as measured by premiums, and the share of total benefits paid fell from 35.1 to 33.1 percent. This decline in the share of total benefits paid continued a trend dating back to 1965. However, the Blue Cross/Blue Shield share of hospital benefits paid increased slightly between 1983 and 1985, from 40.1 to 40.8 percent.

The Blue Cross and Blue Shield Association has analyzed data on Blue Cross hospital utilization by subscribers under 65 years of age for 13 consecutive quarters,

Table 5.4

PERCENT DISTRIBUTION OF PRIVATE HEALTH INSURANCE PREMIUMS, TOTAL BENEFIT PAYMENTS, AND HOSPITAL BENEFIT PAYMENTS BY TYPE OF INSURER

1983-85

Type of Insurer	Premiums			Total Benefits			Hospital Benefits		
	1983	1984	1985	1983	1984	1985	1983	1984	1985
Total Private Health Insurance	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Blue Cross/ Blue Shield	34.3	32.9	31.1	35.1	33.9	33.1	40.1	40.2	40.8
Commercial Insurers	42.7	41.9	41.3	40.9	39.4	38.3	40.6	38.1	36.0
Group	24.8	21.9	20.4	23.2	19.6	18.9	23.5	19.2	18.0
Individual	4.2	4.4	4.5	3.2	3.5	3.4	3.0	3.4	3.4
Minimum Premium Plans	13.8	15.7	16.5	14.5	16.3	15.9	14.2	15.4	14.7
Self Insured	16.8	18.7	20.5	17.7	20.1	21.4	16.3	18.6	19.7
Prepaid Health Plans	6.2	6.5	7.0	6.3	6.7	7.3	2.9	3.2	3.5

Source: Health Care Financing Administration, Office of the Actuary.

for 61 plans that reported complete inpatient data and for 59 plans that reported complete outpatient data. These data were adjusted for seasonality and for plan membership changes. A statistical analysis was performed to compare utilization in the seven quarters preceding the implementation of PPS on October 1, 1983 ("pre-PPS") with utilization in the six quarters following that date ("post-PPS"). This analysis is summarized in Table 5.5.

As shown in Figure 5.2, admissions per thousand members were declining by 0.7 percent per year in the pre-PPS period and by 6.7 percent per year in the post-PPS period. Figure 5.3 shows that length of stay was declining by 1.6 percent per year in the pre-PPS period and by 2.2 percent per year in the post-PPS period. The changes in both of these rates were statistically significant, resulting in a statistically significant acceleration in the rate of decline in inpatient days per thousand members from 2.2 percent per year in the pre-PPS period to 8.8 percent per year in the post-PPS period. Somewhat surprisingly, Figure 5.4 shows that the rate of growth in outpatient visits per thousand members slowed between the two periods, from 3.6 percent to 2.7 percent per year, although this change was not statistically significant.

Several measures of Blue Cross utilization were lower in the waiver States than in the non-waiver States during the periods under study, continuing historical patterns. Inpatient admissions and inpatient patient days per thousand members were consistently lower in the waiver States than in the non-waiver States, while length of stay was consistently slightly higher. Figures 5.5, 5.6, and 5.7 show that the patterns of change were similar in the two groups of States. The waiver State sample size (ten plans in four States) is too small to determine whether changes in rates between the pre-PPS and post-PPS periods were statistically significant; however, comparison of the patterns in the two groups of States suggests that the

Table 5.5
ANNUAL PERCENTAGE CHANGES IN
BLUE CROSS/BLUE SHIELD UTILIZATION AND PAYMENTS
PRE- AND POST-PPS, IN WAIVER AND NON-WAIVER STATES

Indicator	Nationwide pre-PPS	Nationwide post-PPS	Waiver pre-PPS	Waiver post-PPS	Non-Waiver pre-PPS	Non-Waiver post-PPS
Inpatient:						
Days Per Thousand Members	- 2.2%	- 8.8%	0.1%	- 5.7%	- 2.5%	- 8.1%
Admissions Per Thousand Members	- 0.7	- 6.7	2.1	- 8.0	- 1.1	- 5.8
Average Length of Stay	- 1.6	- 2.2	- 2.4	- 1.7	- 1.2	- 2.5
Payments Per Thousand Members	10.3	- 0.3	13.7	0.6	10.0	- 0.1
Outpatient:						
Visits Per Thousand Members	3.6	2.7	6.0	- 3.2	2.8	5.8
Payments Per Thousand Members	16.5	12.0	17.4	7.3	16.5	14.6
Total:						
Payments Per Thousand Members	10.8	2.2	14.1	3.0	10.2	2.4

Source: Scheffler and Gibbs (1985).

FIGURE 5.2

INPATIENT ADMISSIONS/1000 MEMBERS SEASONALLY ADJUSTED TO 1ST QUARTER

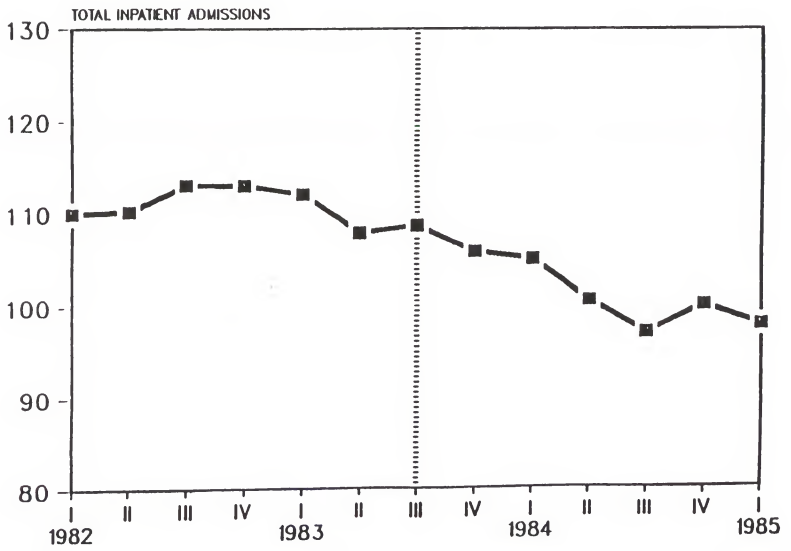


FIGURE 5.3

AVERAGE INPATIENT LENGTH OF STAY SEASONALLY ADJUSTED TO 1ST QUARTER

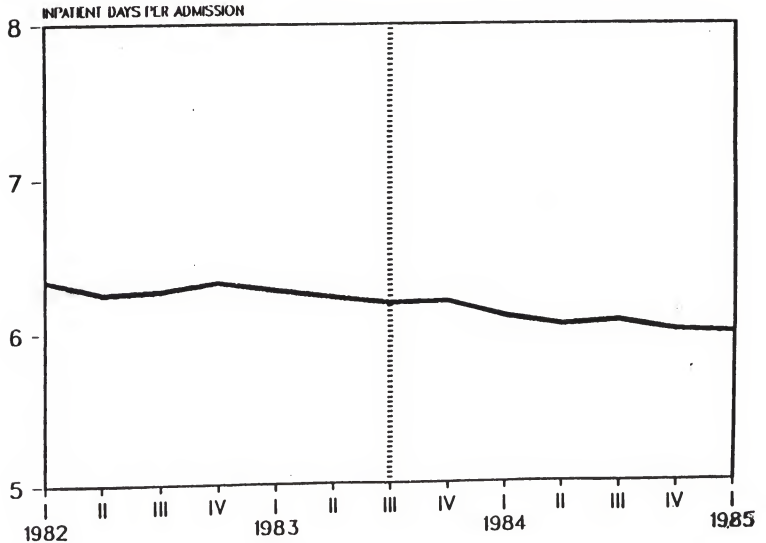
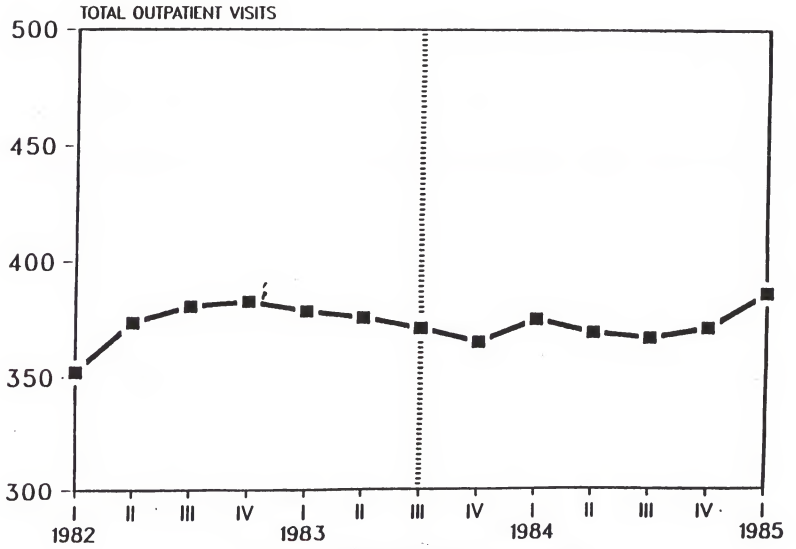


FIGURE 5.4

OUTPATIENT VISITS/1000 MEMBERS SEASONALLY ADJUSTED TO 1ST QUARTER



SOURCE: BLUE CROSS PLAN DATA

FIGURE 5.5

INPATIENT ADMISSIONS/1000 MEMBERS
WAIVER AND NON-WAIVER STATES
SEASONALLY ADJUSTED TO 1ST QUARTER

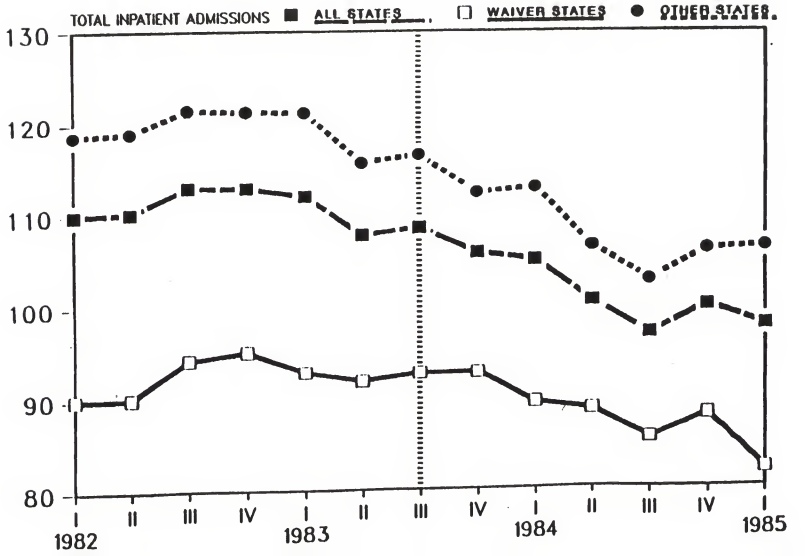


FIGURE 5.6

AVERAGE INPATIENT LENGTH OF STAY
WAIVER & NON-WAIVER STATES
SEASONALLY ADJUSTED TO 1ST QUARTER

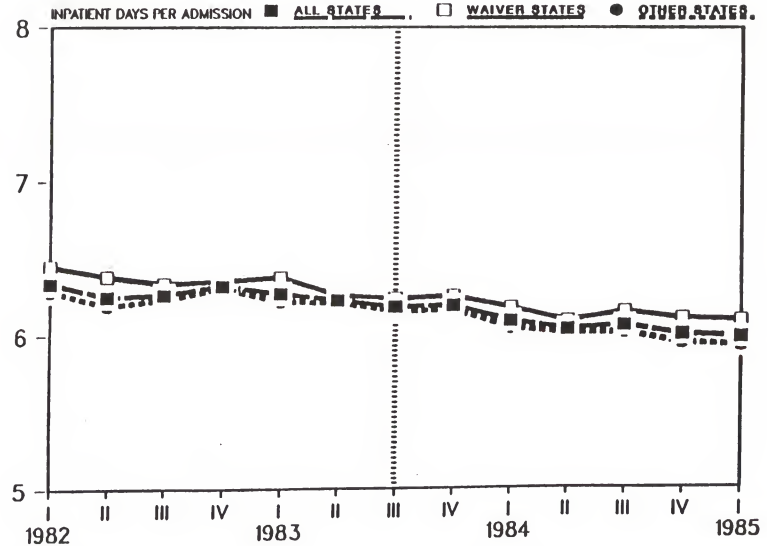
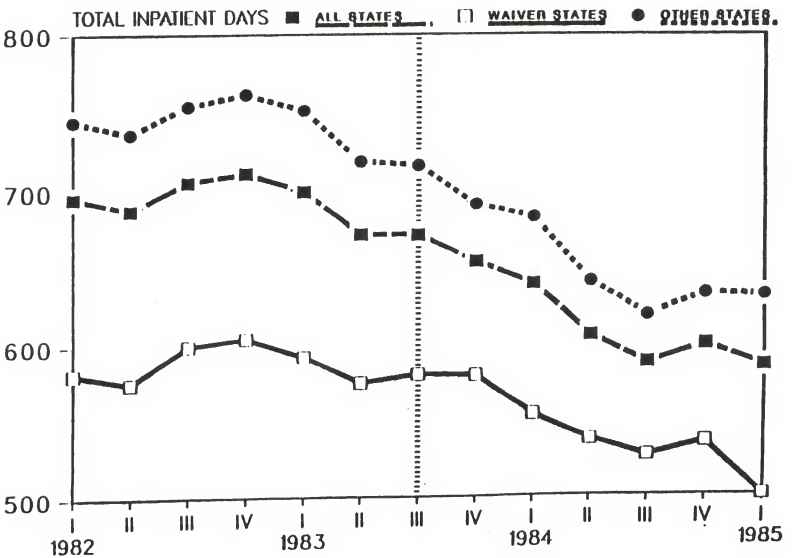


FIGURE 5.7

INPATIENT DAYS/1000 MEMBERS
WAIVER & NON-WAIVER STATES
SEASONALLY ADJUSTED TO 1ST QUARTER



utilization changes observed may not have been a result of Medicare's PPS, which did not directly affect the waiver State hospitals.

The observed changes in Blue Cross utilization in waiver State plans suggest the possibility of utilization-reducing changes in hospital and physician behavior contemporaneous with, but independent of, the advent of PPS. If such changes occurred, the pre/post-PPS comparisons may overstate the impact of PPS on Blue Cross utilization. Alternative explanations would be that hospital and physician behavior changes motivated by PPS were emulated by hospitals not immediately affected by Medicare's new system, either in anticipation of the extension of PPS to waiver States in the future (as has occurred in Massachusetts and New York during FY 1986) or as part of a general shift in attitudes and management practices in the hospital industry nationwide.

Payments

Hospital inpatient payments per thousand Blue Cross members have leveled off from fairly rapid growth in the pre-PPS period, and have recently fallen in real terms, as shown in Figure 5.8. These changes were statistically significant. This partly reflects a statistically significant slowing in growth of payments per admission (to a slight decline in real terms), but largely reflects the sharp drop in admissions per thousand members.

Since the rate of growth of outpatient payments has not changed significantly, as shown in Figure 5.9, total hospital payments per thousand members continued to increase in nominal terms, but began to decline in real terms under PPS, as shown in Figure 5.10. Both the real and nominal rates of growth of total hospital payments were slower than in the pre-PPS period. The decrease in the growth rate of total

FIGURE 5.8

INPATIENT PAYMENTS/1000 MEMBERS SEASONALLY ADJUSTED TO 1ST QUARTER

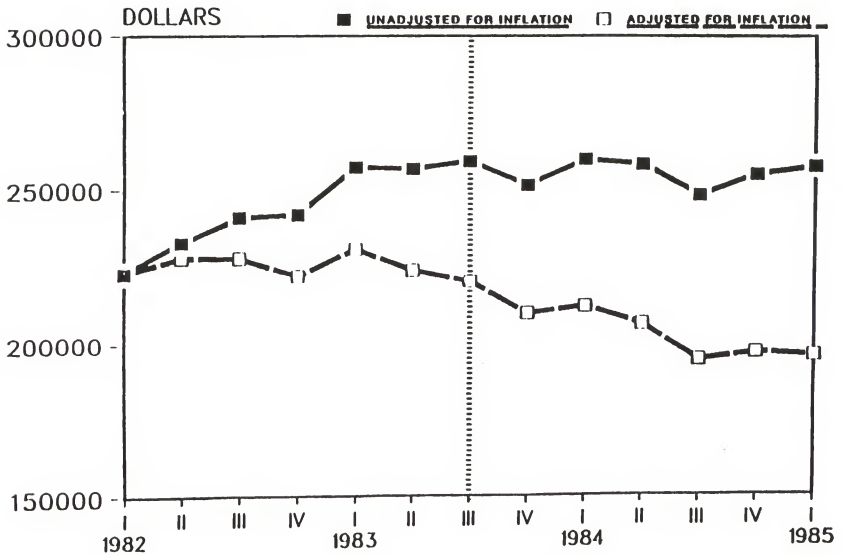


FIGURE 5.9

OUTPATIENT PAYMENTS/1000 MEMBERS SEASONALLY ADJUSTED TO 1ST QUARTER

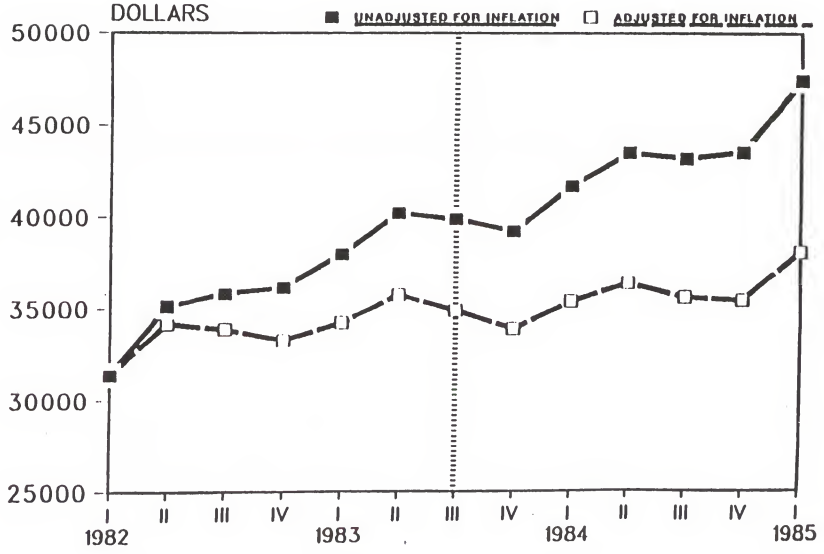
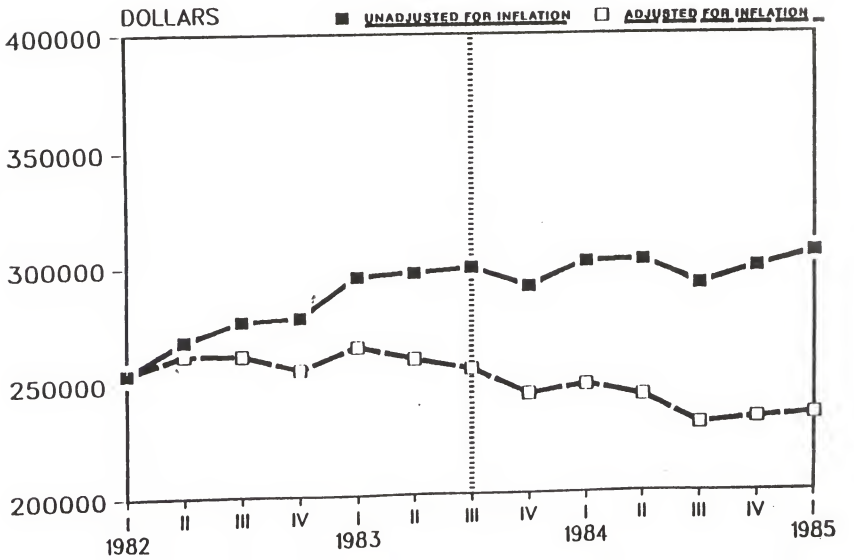


FIGURE 5.10

TOTAL PAYMENTS/1000 MEMBERS SEASONALLY ADJUSTED TO 1ST QUARTER



5.10c

payments per thousand members (both real and nominal) was statistically significant.

These data show that the rates of growth of inpatient, outpatient, and total payments per thousand members decreased in both waiver and non-waiver States. However, only the changes in inpatient and total payments per thousand members in non-waiver States were statistically significant. As with the utilization results, the lack of a statistically significant decline in the waiver States may be due to the small size of the sample of plans in those States.

Other Private Health Insurance

The data in Table 5.4 show that the market share of private health insurance firms other than the Blue Cross and Blue Shield plans--the commercial insurers--decreased between 1983 and 1985 by about 1.4 percentage points (from 42.7 to 41.3 percent). Their share of total benefits paid fell from 40.9 to 38.3 percent, and their share of hospital benefit payments from 40.6 to 36.0 percent.

Payments

Table 5.6 shows the annual rates of increase in private health insurance premiums, total benefit payments, and hospital benefit payments between 1974 and 1985. The data in this table indicate that private health insurance benefit payments (including Blue Cross/Blue Shield) have increased more slowly since 1983 than at any time in the past decade. In particular, benefit payments for hospital care grew by only 2.6 percent in 1984 and 5.1 percent in 1985, compared with increases in total benefit payments of 7.0 and 8.2 percent, respectively. Clearly,

Table 5.6

PERCENTAGE CHANGE IN PRIVATE HEALTH INSURANCE
PREMIUMS, TOTAL BENEFIT PAYMENTS, AND HOSPITAL BENEFIT PAYMENTS
BY YEAR, 1974-85

Year	Premiums	Total Benefits	Hospital Benefits
1974-1975	19.0%	24.3%	24.3%
1975-1976	21.7	20.3	19.7
1976-1977	18.9	14.3	13.1
1977-1978	11.6	14.2	12.5
1978-1979	15.7	15.9	15.4
1979-1980	17.1	18.6	17.2
1980-1981	16.3	16.1	16.5
1981-1982	16.9	14.7	13.7
1982-1983	11.1	9.0	7.0
1983-1984	10.7	7.0	2.6
1984-1985	9.7	8.2	5.1

Source: Health Care Financing Administration, Office of the Actuary.

the moderation of hospital costs has benefitted the private health insurance industry overall. The growth rate of premiums has also slowed, but remained higher than benefit payments. This suggests that the private health insurance industry is financially healthy--at least under the first few years of the accelerated cost-containment activity.

Alternative Payment Systems

It is not yet clear how PPS is affecting prepaid group practice plans, HMOs, competitive medical plans (CMPs), and other forms of alternative payment and delivery systems. It has been hypothesized that, as other segments of the health sector cut costs and become more competitive, alternative payment systems will find themselves facing increasing competitive challenges. In addition, since HCFA bases its payments for Medicare beneficiaries enrolled in HMOs and CMPs on the adjusted average per capita cost (AAPCC) of non-HMO member and non-CMP member beneficiaries, any success by PPS in reducing fee-for-service cost growth will indirectly affect HMOs and CMPs, by reducing their rate of payment for Medicare beneficiaries.

As shown in Table 5.7, prepaid health plans grew at a rate exceeded only by self-insured plans in 1984 and 1985. As a result, their market share of premiums, as shown in Table 5.4, grew from 6.2 to 7.0 percent. Both their hospital benefit payments and their total benefit payments also grew rapidly, by 18.2 percent and 14.9 percent, respectively, in 1985. It is also interesting to note the ratio of the change in benefit payments to the change in premiums was greater for prepaid health plans than for any other payer during the period between 1983 and 1985.

Table 5.7
FERCENTAGE CHANGE IN PRIVATE HEALTH INSURANCE
PREMIUMS, TOTAL BENEFIT PAYMENTS, AND HOSPITAL BENEFIT PAYMENTS
BY TYPE OF INSURER BY YEAR, 1983-85

Type of Insurer	Premiums		Total Benefits		Hospital Benefits	
	1983-84	1984-85	1983-84	1984-85	1983-84	1984-85
Total Private Health Insurance	10.7%	9.7%	7.0%	8.2%	2.6%	5.1%
Blue Cross/ Blue Shield	6.2	3.9	3.3	5.7	2.9	6.7
Commercial Insurers	8.5	8.2	3.0	5.1	- 3.8	- 0.5
Group	- 2.2	2.3	9.5	4.2	- 16.0	- 1.5
Individual	15.5	12.1	17.5	7.1	19.5	3.2
Minimum Premium Plans	25.7	15.4	19.8	5.8	11.5	0.0
Self Insured	23.6	20.1	21.4	15.3	16.8	11.4
Prepaid Health Plans	16.0	18.7	13.9	18.2	10.5	14.9

Source: Health Care Financing Administration, Office of the Actuary.

Discussion

The introduction of Medicare prospective payment has had wide-ranging effects throughout the health care market. Medicare's new payment system has served as a model for other payers who also have been struggling with health care cost problems for years. The new Federal cost containment initiatives have stimulated other payers to introduce innovative payment changes and has led increasingly to the abandonment of traditional cost-based reimbursement as a means of payment for hospital care. This chapter reviews the evidence on the effects that PPS has had on other payers for health care.

The introduction of PPS appears to have had the greatest effect on State Medicaid programs. Since 1981, when States obtained greater discretion in details of program design, many jurisdictions have changed Medicaid eligibility rules and payment methodologies. Medicare's PPS may have stimulated some of the new movement toward prospective payment for Medicaid inpatient hospital services, and certainly provided a model system that several States have built upon.

Private payers also appear to have been affected by the introduction of PPS. Possibly in response to the example set by Medicare's cost-containment efforts, or in an attempt to prevent providers from shifting costs to them, private payers were implementing or planning to implement DRG-based payment systems, and undertaking many other initiatives to control health costs. These include second surgical opinion programs, the encouragement of ambulatory surgery, establishment of HMOs, and increased involvement in preferred provider arrangements.

As a result of these private sector initiatives, or simply due to more effective cost control by providers, the growth rate of utilization and costs for both Medicaid and private payers--especially for hospital services--has decreased.

Costs do not appear to have been shifted from Medicare to private payers, and private insurers do not appear to have suffered financially. Private health insurance expenditures for hospital care increased at less than one-third the rate of Medicare expenditures in 1984. While the growth rate of private health insurance premiums has declined in recent years, the growth rate of health insurance benefit payments has declined more steeply.

It is not yet clear how PPS has affected prepaid group health plans, HMOs, CMPs, and other types of alternative payment and delivery systems. In 1984, prepaid health plans showed the largest premium growth of any form of private health insurance, but their total benefit and hospital benefit payments also grew most rapidly.

Over the next several years, the impact of PPS on other payers for inpatient hospital services will be the subject of further study. Changes in the Medicaid programs and the Blue Cross/Blue Shield plans will continue to be monitored, and efforts to monitor the effect on the commercial insurers will be intensified. In addition, plans are being developed to study the growth of competition in the health insurance market, the increasing cooperation between providers and payers, and the development of alternative methods of payment for health care.

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Chapter 6

IMPACT ON OTHER PROVIDERS OF HEALTH CARE

Overview

As hospitals respond to the system of incentives created by PPS, their decisions regarding the treatment of Medicare patients are expected to have an impact on other providers of health care, particularly outpatient and emergency hospital departments, physicians, nursing homes, and providers of home health care.

The 1984 annual report on the impact of the PPS (U.S. Department of Health and Human Services, 1985) presented some evidence of increased post-hospital care activity. In addition, preliminary survey data indicated that physicians were being encouraged to reduce ancillary services, shorten hospital lengths of stay, and encourage outpatient testing.

Matrix Study Issues

Developed in PPS year one to focus impact evaluation issues, the PPS Study Issue Matrix represents a listing of various hypotheses that may be used to assess the impact of Medicare PPS on other providers of health care.

As in last year's report, this matrix, which is reproduced as Table 6.1, describes both the anticipated benefits and potential consequences of PPS, as they might affect economic considerations, access to post-hospital care, and quality of care furnished by other providers. The matrix has been reviewed to assure that issues within the scope of the Congressional mandate and which were identified in

Table 6.1

PPS STUDY ISSUES:
HYPOTHETICAL IMPACT ON OTHER PROVIDERS

Economic Impact

--Anticipated Benefits:
- Increased provision of health care in less expensive non-hospital settings.
- Improved coordination of outpatient, inpatient, and post-hospital care.

--Other Potential Consequences:
- Inappropriate shifting of hospital treatment to outpatient settings.
- Pressure on physicians to inappropriately alter their practice patterns.
- Too few in-hospital physician consultations.
- Increase in the volume and complexity of services required by more severely ill patients discharged earlier ("sicker and quicker") from inpatient to post-hospital care.

Impact on the Quality of Care

--Anticipated Benefits:
- More efficient patient management.
- Improved coordination of outpatient, inpatient, and post-hospital care.

--Other Potential Consequences:
- Too few in-hospital physician consultations.
- Inappropriate shifting of hospital treatment to outpatient settings.
- Inability of post-hospital care providers to meet the greater and more complex care requirements by more severely ill patients discharged earlier ("sicker and quicker") from inpatient care.

Impact on Access to Care

--Anticipated Benefits:
- Increased availability of services in (less expensive) non-hospital settings.
- Improved coordination of outpatient, inpatient, and post-hospital care.

--Other Potential Consequences:
- Longer backlogs of patients awaiting post-hospital care.
- Obstacles to providing a continuum of health care, due to certificate of need restrictions, contracting prohibitions, etc.

various methodological studies, such as by the Office of Technology Assessment (OTA) prospective payment report (U.S. Congress, Office of Technology Assessment, 1985) are addressed.

Limitations

Our current treatment of issues listed in Table 6.1 focuses on short-run responses and structural changes primarily of a descriptive nature. First, we have updated various Medicare program statistics on utilization, expenditures, and services for outpatient hospitals, physician services, and post-hospital care and estimates from HCFA's Office of the Actuary (OACT) of incurred Medicare benefit payments (see Table 6.2). In addition, we have examined available data from the American Hospital Association (AHA) and the Commission on Professional and Hospital Activities (CPHA). Also, we have completed several studies that allow us to describe shifts in location of physician services, the perceived impact of the Medicare PPS on physicians' patient care behavior, and the perceived impact of PPS on the structure of the blood banking industry. Finally, we have referenced studies that are expected to be completed for future reports in this series. It should be noted that we continue to be limited, as all researchers have been in the short run, by a lack of outcome and other data and criteria for assessing the effectiveness of the program.

Organization of the Chapter

The findings in this chapter are organized by provider type. Trends in estimated incurred Medicare benefit payments by type of provider are reviewed,

Table 6.2

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS BY TYPE OF PROVIDER
FY 1967-85
(in $ millions)

Fiscal Year	Outpatient Hospital[a] Amount	Pct. Change	Physician[b] Amount	Pct. Change	Skilled Nursing Amount	Pct. Change	Home Health[c] Amount	Pct. Change
1967	25	---	1,048	---	147	---	34	---
1968	43	+ 72.0	1,309	+ 24.9	361	+145.6	69	+102.9
1969	80	+ 86.0	1,489	+ 13.8	416	+ 15.2	94	+ 36.2
1970	115	+ 43.8	1,600	+ 7.5	294	- 29.3	100	+ 6.4
1971	149	+ 29.6	1,726	+ 7.9	216	- 26.5	85	- 15.0
1972	172	+ 15.4	1,900	+ 10.1	180	- 16.7	91	+ 7.1
1973	193	+ 12.2	2,062	+ 8.5	203	+ 12.8	116	+ 27.5
1974	381	+ 97.4	2,470	+ 19.8	255	+ 25.6	151	+ 30.2
1975	539	+ 41.5	2,989	+ 21.0	279	+ 9.4	248	+ 64.2
1976	751	+ 39.3	3,539	+ 18.4	318	+ 14.0	356	+ 43.5
TQ*	256	---	1,051	---	87	---	107	---
1977	1,077	---	4,399	---	352	---	478	---
1978	1,300	+ 20.7	5,202	+ 18.3	354	+ 0.6	556	+ 16.3
1979	1,577	+ 21.3	6,152	+ 18.3	366	+ 3.4	649	+ 16.7
1980	1,890	+ 19.8	7,449	+ 21.1	402	+ 9.8	782	+ 20.5
1981	2,268	+ 20.0	8,967	+ 20.4	439	+ 9.2	977	+ 24.9
1982	2,660	+ 17.3	10,818	+ 20.6	473	+ 7.7	1,293	+ 32.3
1983	3,162	+ 18.9	13,056	+ 20.7	518	+ 9.5	1,683	+ 30.2
1984	3,679	+ 16.4	14,732	+ 12.8	544	+ 5.0	2,021	+ 20.1
1985	4,396	+ 19.5	16,053	+ 9.0	590	+ 8.5	2,346	+ 16.1

[a]Includes payments for routine maintenance dialysis treatments since FY 1974.
[b]Includes payments for durable medical equipment, ambulance, and several other non-physician services covered under Medicare Supplementary Medical Insurance.
[c]Includes payments under both Medicare Hospital Insurance and Supplementary Medical Insurance.

*Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Note: Payments on an incurred basis by type of provider are estimated and subject to change as more recent and complete data become available and estimates are revised.

Source: Health Care Financing Administration, Office of the Actuary.

and Medicare covered charges, Medicare and total community utilization of hospital clinics and emergency room visits, and shifts in location of Part B services and reasonable charges are examined. Physicians' perceptions of the short-term impact of PPS on their inpatient hospital practices are discussed. Findings from a study of the impact of PPS on the structure of the blood banking industry, as requested by FY 1985 House Appropriations Committee Report (House Report No. 98-911), are reported. For post-hospital care providers, changes in the discharge destinations of Medicare and other patients, recent trends in SNF admission notices, variation in post-hospital utilization, availability of SNFs and beds by State, and availability of Medicare HHA services are reviewed.

Trends in Estimated Incurred Medicare Benefit Payments Across Providers

As shown in Table 6.2, data from OACT indicate that the growth rate of estimated incurred Medicare benefit payments slowed across all types of "other" providers (outpatient hospital, physicians, SNFs, and home health) between FY 1983 and FY 1984. In FY 1985, the rate of growth of estimated incurred payments continued to slow for physicians (12.8 percent to nine percent), and home health providers (20.1 percent to 16.1 percent), but increased for SNFs (five percent to 8.5 percent) and for outpatient hospital services (16.4 percent to 19.5 percent).

Outpatient Hospital Services

Even before the advent of PPS, ambulatory care had been the fastest growing segment of the health care industry. Surgical and diagnostic technological innovations have enabled providers to perform procedures on an ambulatory basis

where, previously, multiple-day hospital stays were required. In addition to technological advances, other factors such as reimbursement policies and utilization review have influenced provider service mix changes. For example, the Peer Review Organizations' (PROs') preadmission review and scrutiny of Medicare beneficiaries' inpatient hospital admissions for medical necessity, appropriateness, and quality encourages treatment in the safest and most cost effective setting. The addition of ambulatory surgical benefits by the Omnibus Reconciliation Act of 1980 (Public Law 96-499) and the repeal in 1982 of the required deductible for home health services covered under Medicare Supplemental Medical Insurance (SMI, or Part B) further encouraged the use of outpatient services.

The shift of patient care to outpatient settings may result in reduced risks of complications or nosocomial infections or improved patient comfort. On the other hand, this shift may result in the reduced intensity of care or the delivery of ambulatory care that may not be appropriate for patients' conditions.

In addition, under PPS one might hypothesize that the incentive now exists for hospitals to use alternative sites for delivering care when such alternatives are more profitable than inpatient care. The increased use of outpatient diagnostic testing and outpatient surgery are examples. Hospitals may be developing and substituting outpatient services for previously inpatient services in an effort to attract more patients to revenue-producing services.

PPS provides broad incentives to hospitals to provide cost effective services. As noted in the 1984 annual report on the impact of PPS (U.S. Department of Health and Human Services, 1985), there are direct financial incentives for hospitals to shift some amount of hospital care to ambulatory settings when it is clinically appropriate and cost efficient to do so. Our evidence of shifts in location of some services are described below.

Utilization

Covered Charges: The historical pattern of Medicare covered charges for outpatient hospital services is shown in Table 6.3. For 1984, covered charges grew by 12.1 percent. This was the smallest increase in the previous nine years. The real dollar value for covered charges per enrollee has been steadily increasing over the decade 1975 to 1984, but the 1984 increase of 3.0 percent is relatively small by historical standards.

Visits: Contrary to expectations, Medicare hospital outpatient services provided during the first year of PPS actually declined. Although diverting Medicare patients to ambulatory hospital outpatient treatment settings, which are currently reimbursed on a cost basis, is one of the responses hospitals could be expected to make, data from the AHA's Monthly Panel Survey indicate that this appears not to be the case in the short term.

As shown in Table 6.4, Medicare visits to both hospital outpatient clinics and emergency rooms in community hospitals decreased in 1984 compared to the previous year. Similar decreases, athough not of the same magnitude, were observed in 1984 for total community hospital outpatient clinic and emergency room visits nationally. It should be noted, however, that the ratios of Medicare to total community hospital visits for clinic and emergency room use were virtually unchanged between 1983 and 1984, indicating that hospitals did not treat relatively fewer Medicare patients than the general population. Medicare beneficaries' share of clinic visits was 13.7 percent in 1983 as compared to 13.2 percent in 1984, while emergency room visits were unchanged at 7.5 percent.

Table 6.3

MEDICARE COVERED CHARGES FOR OUTPATIENT HOSPITAL SERVICES
1975-84

Year	Eligible Enrollees	Actual Covered Charges (thousands)	Percent Change	Real Covered Charges[a] (thousands)	Percent Change	Real Covered Charges per Enrollee	Percent Change
1975	23,905	$ 747,518	---	$ 453,041	---	$18.95	---
1976	24,614	974,708	+30.4%	530,021	+17.0%	21.53	+13.6%
1977	25,363	1,175,878	+20.6	583,273	+10.0	23.00	+ 6.8
1978	26,074	1,384,067	+17.7	632,861	+ 8.5	24.27	+ 5.5
1979	26,757	1,660,363	+20.0	697,046	+10.1	26.05	+ 7.3
1980	27,400	2,076,396	+25.1	791,008	+13.5	28.87	+10.8
1981	27,941	2,521,191	+21.4	866,985	+ 9.6	31.03	+ 7.5
1982	28,412	3,164,530	+25.5	986,142	+13.7	34.71	+11.9
1983	28,975	3,813,118	+20.5	1,101,739	+11.7	38.02	+ 9.6
1984	29,415	4,274,342	+12.1	1,151,493	+ 4.5	39.15	+ 3.0

[a]In 1967 dollars, deflated by the Consumer Price Index for "physician services."

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 6.4: Estimated Medicare Share of Total Community Hospital Clinic and Emergency Room Visits: Calendar Years 1983 and 1984

	Calendar Year		
	1983	1984	Percent Change
All Patients in Community Hospitals[a]			
Total AHA ER Visits	79,189,766	78,762,306	-0.5
Total AHA Clinic Visits	42,939,745	41,149,761	-4.2
Medicare Patients[b]			
Total Medicare ER Visits	5,959,000	5,889,000	-1.2
Ratio of Total Medicare ER to Total ER Visits	0.075	0.075	
Total Medicare Clinic Visits	5,900,000	5,449,000	-7.6
Ratio of Total Medicare Clinic Visits to Total AHA Clinic Visits	0.137	0.132	

[a]The data for community hospitals presented here does not include the category "Other Visits", which would capture various diagnostic, therapeutic and ancillary service visits. Visits in this "Other" category numbered 107,428,019 for CY 1983 and 112,919,825 for CY 1984.

Medicare does not have a visit count directly comparable to the AHA "Other Visits" category. However, there were more Medicare patients who received benefits for hospital outpatient services "other than emergency room or clinic" (5.4 million in CY 1983 and 5.5 million in CY 1984) than who received benefits for "emergency room and/or clinic visits" (4.4 million in 1983 and 4.3 million in CY 1984).

[b]Excludes all persons under age 65 with end-stage renal disease.

SOURCES: HCFA: Office of Research and Demonstrations
AHA: Panel Survey Data for Community Hospitals, 1983 and 1984

However, the most rapidly growing form of community hospital outpatient activity has been in "other" visits (107.4 million in CY 1983 and 112.9 million in CY 1984, a 5% increase). Community hospitals are increasing their use of outpatient departments for diagnostic, therapeutic, and ancillary services visits. For this same period, we also observed an increase in the number of Medicare beneficiaries who received hospital outpatient department services "other than emergency room visits or clinic visits." This number grew from 5.4 million in CY 1983 to 5.5 million in CY 1984, while the number of beneficiaries making either emergency room visits or clinic visits declined from 4.4 million to 4.3 million.

The national decrease in total hospital outpatient clinic and emergency room visits is most likely explained by increased competition from free-standing ambulatory medical organizations for nonurgent care clients. Health professionals have long believed that a substantial amount of services furnished in emergency rooms was not of an emergent or life threatening nature. This, plus the rapid expansion of ambulatory outpatient health centers providing consumers more choices of providers and settings, may be an early sign that the public use of hospitals for nonurgent walk-in care is declining. While this trend was observable before the enactment of PPS, the change following PPS is greater than would be expected.

Location of services: The HCFA five percent Bill Summary Record file allows us to disaggregate medical and surgical services provided under Medicare Part B by location of service. This data file provides a better insight into shifts of services from inpatient settings to outpatient settings. Between 1983 and 1984, there was a substantial decrease in both medical and surgical Part B inpatient hospital services, with simultaneous increases in medical and surgical services provided in physicans'

offices, outpatient hospitals, and all other locations, as shown in Table 6.5a.

Table 6.5a provides further insight into the medical or surgical composition of hospital outpatient services that were provided. There appears to be a trend toward the performance of more complex--or at least more expensive--surgical procedures in outpatient settings. From 1982 to 1985, while medical services provided in hospital outpatient settings increased by about one percent, the number of surgical services in the outpatient setting grew from 5.9 percent to 10.4 percent of all surgical services provided under Medicare Part B. Thus, the growth in outpatient hospital services is almost entirely explained by increases in surgical services. Over that same period, the value of outpatient surgical services (percent of reasonable charges) rose from 4.8 percent to 20.5 percent of all surgical services covered under Medicare Part B, as shown in Table 6.5b.

Both medical and surgical services provided in office settings were also growing rapidly during the same time period, increasing from 49.5 percent to 55.4 percent and 55.6 percent to 60.6 percent, respectively, of all Part B services, as shown in Table 6.5a. The relative gain in the office setting share of services was about the same for medical (six percent) and surgical (five percent) between 1982 and 1985. Overall, surgery appears to be shifting more rapidly from hospital inpatient to outpatient settings, including hospital outpatient departments, while medical inpatient hospital services are shifting predominantly into office settings.

Payments

Estimated Medicare incurred benefit payments for outpatient hospital services

Table 6.5a

LOCATION OF MEDICAL AND SURGICAL SERVICES
PROVIDED UNDER MEDICARE SUPPLEMENTARY MEDICAL INSURANCE
BY PERCENT OF SERVICES
1982-85

Location	1982	1983	1984	1985
Medical Care:	100.0%	100.0%	100.0%	100.0%
Office	49.5	49.5	51.5	55.4
Inpatient hospital	41.3	40.5	37.9	34.3
Outpatient hospital	3.3	3.6	4.4	4.3
Other	5.9	6.4	6.2	5.9
Surgery:	100.0	100.0	100.0	100.0
Office	55.6	55.4	55.6	60.6
Inpatient hospital	32.7	31.9	30.1	24.3
Outpatient hospital	5.9	6.7	8.7	10.4
Other	5.8	6.0	5.6	4.7

Table 6.5b

LOCATION OF MEDICAL AND SURGICAL SERVICES
PROVIDED UNDER MEDICARE SUPPLEMENTARY MEDICAL INSURANCE
BY PERCENT OF REASONABLE CHARGES
1980-85

Location	1980	1982	1983	1984	1985
Medical Care:	100.0%	100.0%	100.0%	100.0%	100.0%
Office	43.4	42.4	42.5	43.9	48.0
Inpatient hospital	48.2	49.5	49.0	46.5	42.4
Outpatient hospital	3.0	3.1	3.2	4.2	4.4
Other	5.3	5.0	5.3	5.4	5.1
Surgery:	100.0	100.0	100.0	100.0	100.0
Office	11.7	12.6	12.9	13.6	16.1
Inpatient hospital	84.4	81.9	79.6	74.0	62.2
Outpatient hospital	3.3	4.8	6.7	11.5	20.5
Other	0.5	0.7	0.8	1.7	1.3

Source: Health Care Financing Administration, Office of Research and Demonstrations.

are shown in Table 6.6.[1] As shown in this table, outpatient payments increased by 19.5 percent in FY 1985, compared to 16.4 percent in FY 1984. This is the largest increase since FY 1981. Adjusting for inflation, the increase of 15.3 percent is the largest in the last eight years. The AHA Panel Survey data in Table 6.7 show similar growth of hospitals' outpatient revenue per visit. In the pre-PPS period 1982 to 1983, hospital outpatient departments experienced an 11.5 percent increase in revenue per visit. Revenues per visit increased by 12.4 percent in 1984 and by 13.2 percent in 1985. This indicates that outpatient services may be a continuing source of profit for community hospitals.

In summary, trends in percent of reasonable charges and services indicate that Part B medical and surgical services (of which physician services account for about 76 percent) are increasingly being performed in outpatient and office settings, rather than in the inpatient setting. The data indicate that, while shifts away from inpatient care were occuring before prespective payment, even more dramatic changes occurred after PPS--especially in the case of surgery.

Physicians' Services

PPS was not designed to directly impact upon the physician. However, one would expect that, in responding to PPS incentives, hospital administrators would encourage physicians to use the hospital in a manner consistent with the direct incentives faced by the hospital.

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[1]These estimates include payments for routine maintenance dialysis treatments since FY 1974.

Table 6.6

ESTIMATED MEDICARE PAYMENTS FOR OUTPATIENT HOSPITAL SERVICES*
FY 1967-85

Fiscal Year	Actual Payments (in $ millions)	Percent Change	Real Payments[b] (in $ millions)	Percent Change
1967	25	---	25	---
1968	43	+ 72.0	42	+ 66.4
1969	80	+ 86.0	75	+ 77.5
1970	115	+ 43.8	102	+ 35.7
1971	149	+ 29.6	125	+ 23.1
1972	172	+ 15.4	139	+ 11.4
1973	193	+ 12.2	151	+ 7.9
1974	381	+ 97.4	273	+ 81.2
1975	539	+ 41.5	347	+ 27.3
1976	751	+ 39.3	452	+ 30.1
TQ*	256	---	149	---
1977	1,077	+ ---	603	---
1978	1,300	+ 20.7	680	+ 12.8
1979	1,577	+ 21.3	747	+ 10.0
1980	1,890	+ 19.8	788	+ 5.5
1981	2,268	+ 20.0	852	+ 8.1
1982	2,660	+ 17.3	930	+ 9.2
1983	3,162	+ 18.9	1,068	+ 14.9
1984	3,679	+ 16.4	1,194	+ 11.8
1985	4,396	+ 19.5	1,376	+ 15.3

*Transitional quarter between Federal fiscal years 1976 (ending in June 1976) and 1977 (beginning in October 1976).

[a]Includes payments for routine maintenance dialysis treatments since FY 1974.

[b]In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Table 6.7: Community Hospital Outpatient Revenue - 1982-1985[a]

	CY 1982	CY 1983	Pct. Chg.	CY 1984	Pct. Chg.	CY 1985	Pct. Chg.
Outpat. Revenue (000's $$)	14,853,055	17,021,758	14.6	19,402,710	14.0	22,961,189	18.3
Outpatient Department Rev./Visit	66.51	74.15	11.5	83.33	12.4	94.34	13.2

[a]These AHA revenue data represent three categories of visits: emergency room, clinic and "other." For Medicare beneficiaries, the estimated total covered charges for all hospital outpatient department care (for non-admitted patients) was $4 billion for CY 1983 and $4.4 billion for CY 1984. Approximately half of Medicare covered charges for hospital outpatient department care were for persons who did not have emergency room or clinic visits. The published AHA panel survey data does not separate revenues by visit category.

SOURCE: AHA National Hospital Panel Survey, 1982-1985

Encouragement of changes in physician behavior by hospital administrators was expected to be concentrated on areas with potential cost savings for hospitals, such as in reducing length of stay and limiting the use of unnecessary ancillary services. It was also expected that hospitals would encourage increased use of outpatient testing, since the hospital would not receive additional payment for testing done during a patient's inpatient stay. There was also some speculation that hospitals might encourage physicians to select "profitable" patients for admission, or to increase hospital revenues by admitting more Medicare patients.

The actual measurement of the impact of PPS on physicians is difficult for a number of reasons:

- There were a number of other significant changes in the Medicare program that also directly impact upon physician practice behavior. Perhaps the most important change was the physician fee freeze implemented by the Deficit Reduction Act of 1984 (Public Law 98-369). This act imposed a freeze on the customary and prevailing charges for physician services provided for Medicare beneficiaries (as well as on the actual charges by "nonparticipating" physicians). This freeze had the potential for significantly altering physician practice behavior, because physicians may have an incentive to increase volume and intensity of services in an attempt to recover lost income.

- Physicians may also have incentives to recover lost income resulting from a decreased number of hospital visits due to shorter stays under PPS. Thus, it is difficult to separate changes in physician behavior due to the freeze from changes due to PPS.

- Until recently, there was no standard medical coding system for all Medicare carriers to use in paying for and reporting physician services. The HCFA Common Procedure Coding System was adopted in 1983, but most carriers had not adopted the system until 1985. Thus, national trends for specific physician services cannot easily be studied for the period preceding PPS or immediately after its implementation.

- There are numerous pressures on physicians from sources external to the Medicare program, that are not easily distinguished from PPS incentives. For example, there appears to be increasing competition for patients due to the dramatic growth in the supply of physicians in the U.S. during the past 20 years. Advertising for additional patients is increasingly common, and alternative health care systems (e.g., HMOs, PPOs) are growing rapidly. In addition, many PROs and private insurers' utilization review activities provide incentives similar to PPS.

All of these factors change the types and amount of pressure on physician practice, making it difficult to separate out their effects from the less direct incentives of the PPS.

Physicans' Perceptions of PPS Impact

To obtain some indication as to the extent to which these pressures were being applied and to which PPS may be responsible for these pressures, physician impressions were obtained as part of HCFA's 1984 Physician Practice Cost and Income Survey (PPCIS) conducted by the National Opinion Research Center

(Sprachman et al., 1985). This survey involved a nationally representative sample of 4,729 physicians and included a few items related to PPS impact and resulting cost control efforts. These questions were asked of all physicians who had had a hospital affiliation for at least one year.

It must be mentioned that, for a number of important reasons, the data from this survey are limited in their usefulness in directly assessing PPS impacts:

- The specific level or degree of encouragement was not measured. Therefore, anything from a general letter from the hospital administrator to all physicians on the medical staff to specific utilization activities targeted to a specific physician or selected patients would likely be reported by the physician as encouragement to change inpatient related activity.

- The survey instrument measures physicians' perception of pressure, but does not indicate whether physicians altered their practice in response to this pressure.

- It is not possible to determine to what extent the pressure applied by the hospital is appropriate for any specific physician. For example, physicians who tend to order unnecessary tests cannot be distinquished from those that do not.

In spite of these limitations, the survey findings are important, in that they provide some indication as to the perceived pressure by physicians to change their inpatient practices and the extent to which they attribute this pressure to PPS. In the final

report summarizing physicians' perceptions of hospital pressures and incentives, the authors (Rosenbach and Cromwell, 1985), the authors conclude that Medicare's PPS has had a widespread impact on physician inpatient activity. Of the radiologists, anesthesiologists and pathologists (RAPs) responding to the survey, 89 percent reported that they had been encouraged to change some aspect of their inpatient practice. The percentage was only slightly lower (83 percent) for all other specialties.

An overview of the survey findings on specific practice impacts is contained in Table 6.8. The most widely reported pressures were to discharge patients sooner and to do testing on an outpatient basis. PPS was cited as being one of the reasons for the reported pressure by 80 percent or more of those physicians reporting pressure in at least one area.

Physicians also reported that they were frequently encouraged to reduce the use of ancillary services, which would further reduce the cost per inpatient stay. Specifically,

- 85 percent of RAPs were encouraged to do testing on an outpatient basis.

- 62 percent of RAPs were urged to limit the use of expensive diagnostic testing.

- 56 percent of RAPs were encouraged to cut department costs by conducting fewer procedures.

Table 6.8

PHYSICIANS' RESPONSES TO SURVEY QUESTIONS
ABOUT THE EFFECTS OF THE PPS

PPS impact[a]	Percent reporting impact	Of those reporting any change, percent citing PPS as reason	Percent of all physicians who cited PPS as reason for change
Radiologists, Anesthesiologists, and Pathologists:[b]			
Percent citing PPS as reason for one or more changes.....	88.8%	84.2%	74.4%
• Try to cut department costs by conducting fewer procedures.....	56.2	87.0	48.9
• Limit the use of expensive diagnostic testing.....	62.3	87.0	54.2
• Do testing on an outpatient basis.....	85.3	85.8	73.1
Other Specialties:[b]			
Percent citing PPS as reason for one or more changes.....	83.1%	79.4%	66.0%
• Increase number of patients admitted.....	21.3	79.6	17.0
• Admit fewer Medicare patients.....	12.9	89.2	11.5
• Admit more Medicare patients.....	3.4	83.0	2.8
• Admit more patients with certain diagnoses	4.5	83.0	3.7
• Reduce number of lab tests or X-rays usually ordered for inpatients	45.1	84.8	38.2
• Discharge patients sooner.....	77.9	82.1	64.0

[a]Specifically, physicians were asked: "Since this time last year, have the physicians in your hospital been encouraged to...?"
[b]Table includes only physicians who (a) had hospital admitting privileges or regularly treated hospitalized patients admitted by other physicians and (b) had been affiliated with a hospital for at least one year.

NOTE: The figures in this table have been weighted to provide national estimates.

Source: Rosenbach and Cromwell (1985).

- 45 percent of all other specialties were encouraged to reduce the number of tests or x-rays usually ordered for inpatients.

Hospital based RAPs were slightly less likely (80 percent) than self employed RAPs (85 percent) or RAPs employed by clinics or HMOs (90 percent) to be pressured to test on an outpatent basis; however there was no difference in encouragement to conduct fewer procedures or reduce costly diagnostic testing reported by employment setting.

By contrast, the physicians who admitted patients to hospitals reported much less pressure with regard to the type or quantity of patients admitted:

- 21 percent of the admitting physicians reported that they were asked to increase the number of patients admitted.

- Five percent were encouraged to admit patients with certain diagnoses.

- 13 percent were encouraged to admit fewer Medicare patients, while three percent were encouraged to admit more Medicare patients.

Secondary data for the hospital in which each respondent practiced or was affiliated were merged with the PPCIS data; this enabled comparisons of responses by hospital characteristics. Although tables are not included here, this analysis found no major differences in perceived impact by region or between urban and rural physicians, or by hospital characteristics (e.g. date hospital came onto PPS, teaching status, bed size, local hospital competition, etc.). Those physicians who had higher Medicare caseloads and greater dependence on hospital revenues

perceived somewhat more pressure to change their practice patterns. Otherwise, reported PPS impacts tended to be fairly consistent for all medical and surgical specialties. The major exceptions were for pediatricians and psychiatrists, fewer of whom reported pressure to discharge patients sooner or to reduce x-rays or lab tests. These differences for pediatricians and psychiatrists would be expected, since the two specialties tend to have low Medicare caseloads.

Blood Banking

House Report 98-911 requested "that a portion of the fiscal year 1985 research budget (for HCFA) be used to intitiate a study of the impact of the new prospective payment sysytem (PPS) on the structure of the blood-banking industry" (U.S. Congress, Committee on Appropriations, 1985). In response, HCFA awarded a contract to Lawrence Johnson and Associates (LJA) of Washington, D.C. in April 1985. Also, HCFA solicited research proposals on this issue through a Federal Register announcement dated January 30, 1985. However, no applications for such studies were received during FY 1985.

The LJA project was designed to be descriptive in purpose and exploratory in nature. It involved literature reviews, surveys and on-site visits to several Washington, D.C., and Richmond, Virginia area hospitals, inquiries to organizations in the blood field, and review of Medicare administrative statistics about blood usage. It was completed in February 1986 (Lawrence Johnson and Associates, 1986).

Among the LJA study findings were the following:

- Most hospitals foresaw no likely effect on sources for whole blood, but

some felt that some blood products may become more difficult to obtain as hospital purchasing power is contained.

- Professional associations generally supported the contention that blood supplies will not be affected, in terms of members' ability to deliver required products. Acquired Immune Deficiency Syndrome (AIDS) was viewed as the major factor endangering the adequacy of blood supplies.

- The respondents indicated the belief that PPS can help blood banks utilize a limited resource more effectively. PPS could lead to the purchase of more processing and services involving blood and blood products. Respondents foresaw the possibility of more blood services merging and a greater sharing of resources.

- None of the respondents saw PPS affecting capital expenditures or biomedical research activities, but most saw negative effects on staffing and educational activity.

- Most respondents felt that PPS was leading to more effective provider management of information for use in optimizing services and cost, including systems to monitor physicians' use of blood products.

- Most respondents would favor special (viz., "pass through") payments for blood-intensive cases, such as leukemia.

- Most hospitals indicated that, although they had cost containment

mechanisms in place prior to PPS, PPS had stimulated further efforts to contain costs, such as competitive-buying arrangements, streamlining serological tests, increased recovery and salvaging, and greater use of maximum blood order scheduling.

- Most respondents felt it will not be economical for hospitals to expand their blood collection efforts. National average blood center prices for whole blood and key products have remained stable between 1983 and 1985. However, there has been greater use of autologous blood, apparently in response to concerns about AIDS.

In summary, the LJA report suggests that Medicare's PPS has become a new economic factor in the blood banking industry. Although the national aspects of this information gathering effort was limited to blood banking associations, the blood banking industry and hospitals generally appear to be successfully adapting, thus far, in ways which have not jeopardized blood supplies or services either quantitatively or qualitatively. There remain, however, some blood banking industry concerns about the future impact of PPS and other health care spending reforms.

Long-Term Care Providers

Long-term care providers are a part of the continuum of care for Medicare beneficiaries. When acute care services are no longer necessary, but sub-acute or skilled nursing care is still required, hospitals discharge many patients to long-term care settings. With the incentive of PPS to reduce costs, hospitals may attempt to

reduce the length of stay and/or limit the amount of services provided. This is likely to affect the relationship between the hospitals and long-term care providers within the health care continuum that existed prior to PPS.

In order to reduce its length of stay, a hospital can improve its discharge planning to ensure that patients can be discharged to appropriate settings as quickly as possible. Since access to long-term care providers may be a problem, a hospital may employ several strategies to secure placement for its patients with long-term care needs. It may establish arrangements with local nursing homes or home health agencies (HHAs) to provide services for its patients, establish its own skilled nursing facilities (SNFs) or HHAs or make use of swing beds, rehabilitation units, or other long-term care beds. For example, a National Research Corporation Survey of 450 hospital administrators found that 17 percent more hospitals were offering home health care services in 1984 than in 1983. Overall, 65 percent of all hospitals surveyed offered or planned to offer home care services. Nursing home services are being offered by 27 percent of the hospitals, up from 14 percent in 1983. Other surveys being conducted by the AHA and the Urban Institute are examining hospitals' establishment of: (1) their own long-term care facilities or services and (2) special arrangements with long-term care providers already existing in the community. Results of this study are expected in 1987.

With hospitals attempting to achieve savings by shifting more patients to other settings not subject to PPS, one would expect to see increased use of post-hospital services, with a corresponding increase in expenditures. With increased demand, one would also expect an expansion in the supply of HHAs and SNFs.

Finally, the types of patients being served by long-term care providers may be changing as a result of the reduction in hospital length of stay. Under the per diem incentives existing prior to PPS, the last few days of a patients' stay may not

have been strictly necessary for acute care but were mainly recuperative. Under the PPS incentives to restrict length of stay to the minimum number of days required for acute care, hospitals are likely to discharge patients as quickly as possible to lower levels of care for their sub-acute or restorative care needs. Consequently, the patients discharged to SNFs and HHAs may have more extensive service needs in the post-PPS period.

The sections that follow examine how all four factors--utilization, expenditures, supply, and type of patients served--have changed for long-term care providers since PPS.

Utilization

One way to look at changes in utilization is to examine hospital discharge destination. CPHA is one source of information on discharge destination for pre- and post-PPS periods. CPHA has been collecting identical discharge destination information for over 1,600 hospitals since the 1960s. Under a HCFA grant, CPHA used their data base to examine the early effects of PPS, including changes in destination. A cohort of 729 U.S. short-term general hospitals from PPS States was selected. A 10 percent sample of Medicare and non-Medicare cases was chosen from the third quarter of each year from 1980 to 1984. A linear forecasting model was used to project 1984 figures, using trends from 1980 to 1983. The model was used to establish 95 percent confidence intervals around a projected value for 1984. The observed 1984 data were analyzed in relation to the confidence interval around the projected value.

Changes in the place of discharge are shown in Table 6.9. Significant changes occurred in 1984 in the proportions of patients discharged home to self-care and

Table 6.9

CHANGES IN DISCHARGE DESTINATIONS
FOR MEDICARE AND NON-MEDICARE PATIENTS
1980-84

Discharge Destination	Previous Trend 1980	1981	1982	1983	1984 Predicted	Actual
Home, Self Care						
Medicare	84.20%	83.95%	84.16%	83.08%	83.06%	79.85%*
Non-Medicare	97.13	97.14	96.93	96.76	96.66	96.34
Skilled Nursing Facility						
Medicare	8.20	7.79	7.44	7.75	7.37	8.53
Non-Medicare	0.20	0.19	0.18	0.21	0.20	0.21
Intermediate Care Facility						
Medicare	2.25	2.43	2.42	2.54	2.63	2.84
Non-Medicare	0.05	0.05	0.08	0.07	0.09	0.08
Home Health Care						
Medicare	2.72	2.88	3.06	3.54	3.71	5.37*
Non-Medicare	0.33	0.38	0.37	0.45	0.47	0.65*
Other Facilites*						
Medicare	0.87	0.93	0.91	1.02	1.04	1.46*
Non-Medicare	0.47	0.46	0.49	0.57	0.58	0.66

*Statistically significant at 95% confidence level.

*Long-term hospitals, rehabilitation facilities, psychiatric hospitals, etc.

Source: Commission for Professional and Hospital Activities (1985).

those discharged home with home health care for the Medicare patients. While the proportion discharged to self-care dropped by more than three percent, the proportion discharged to home with home health care rose by almost two percent. This suggests that the shorter Medicare stays are being supplemented with more use of HHAs for post-discharge care, which is what many analysts had predicted. On the other hand, although discharges to SNFs increased in 1984, the increase was not significant.

The discharge destination data in the CPHA study do not distinguish source of payment, i.e., Medicare, Medicaid, private pay, or other. This lack of identification is a problem if one is trying to look at the effect of PPS on hospital discharges to long-term care providers covered by Medicare. This is particularly true for SNFs, since Medicare accounts for so little of their market, but not as much a problem for HHAs, because Medicare is a larger part of their market.

Medicare statistical data provide additional information on changes in utilization for home health and SNFs since PPS. For SNFs, one can look at data on: covered admissions, covered days of care (total and per 1,000 enrollees), and average covered days of care per discharge. For HHAs, data are available on: persons served (total and per 1,000 enrollees), number of visits (total and per 1,000 enrollees), and average number of visits per person served.

Skilled Nursing Facilities: The number of patients admitted to Medicare SNFs has increased since the advent of PPS, as expected. Between 1983 and 1984, the number of covered admissions rose from 308,000 to 332,000, an increase of 7.7 percent (Table 6.10).

However, the total number of covered days of care declined from 9.1 to 8.9 million during this same time period, a decrease of 2.2 percent (Table 6.11). The

Table 6.10
SNF UTILIZATION
1983 AND 1984

Year	Covered SNF Admissions	Rate of Change	Covered Days of Care Per Admission	Rate of Change
1983	308,929	---	29.2	---
1984	332,746	+ 7.7%	26.6	- 8.9%

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 6.11

TRENDS IN MEDICARE SNF UTILIZATION
1975-84

			Covered Days of SNF Care			
Year	Number (millions)	Percent Change	Per 1,000 Enrollees	Percent Change	Per Hospital Admission	Percent Change
1975	8.9	---	360.0	---	1.10	---
1976	9.7	+9.0%	384.1	+6.7%	1.12	+2.7%
1977	9.6	-1.0	369.1	-3.9	1.06	-5.9
1978	9.1	-5.2	338.9	-8.2	0.97	-8.8
1979	8.6	-5.5	313.0	-7.6	0.88	-9.0
1980	8.7	+1.2	308.6	-1.4	0.83	-5.1
1981	8.6	-1.3	300.0	-2.8	0.79	-5.0
1982	8.7	+1.2	299.3	-0.2	0.77	-3.1
1983	9.1	+4.6	307.3	+2.7	0.78	+1.2
1984	8.9	-2.2	295.2	-3.9	0.78	+0.3

Source: Health Care Financing Administration, Office of Research and Demonstrations.

drop in the number of covered days of SNF care per 1,000 enrollees was 3.9 percent. The average number of covered days of care per discharge dropped by almost 3 days, or 8.9 percent, from 29.2 days in 1983 to 26.6 days in 1984 (Table 6.10). It should be noted that many beneficiaries have stays beyond that which is covered by Medicare, but there are no reliable statistics on the number of SNF days for which the beneficiary is totally liable.

Home Health: Utilization of home health services has been experiencing tremendous growth, particularly since the passage of the Omnibus Reconciliation Act of 1980. This law eliminated: (1) the 100 visit limit under both Part A and Part B, (2) the $60 deductible under Part B, and (3) the 3 day prior hospitalization requirement under Part A. Therefore, it is difficult to determine how much of the change in home health services utilization is due to PPS.

The number of persons receiving Medicare-covered home health care increased by 12.2 percent between 1983 and 1984, from about 1.3 to 1.5 million persons (Table 6.12). However, the rate of growth over this time period was lower than the 13.7 percent annual rate for the period between 1980 and 1983 (immediately prior to PPS). The rate of persons served per 1,000 enrollees grew by about 11 percent between 1983 and 1984. Again, this rate of increase was lower than that for the period immediately prior to PPS.

Between 1983 and 1984, the number of visits increased from almost 37 million to more than 40 million, or 9.5 percent (Table 6.12), with the number of visits per 1,000 enrollees increasing by 7.9 percent. Again, the rates of growth prior to PPS were higher than after PPS. The average number of visits per person served did not change between 1983 and 1984.

Since utilization data for only one year of PPS experience are available, these findings can be considered preliminary. Another factor to consider is that

Table 6.12

TRENDS IN UTILIZATION OF MEDICARE HOME HEALTH AGENCY SERVICES
PERSONS SERVED AND HOME HEALTH VISITS
1974-84

Year	Persons Served		Home Health Visits		
	Number (thousands)	per 1,000 Enrollees	Number (thousands)	per Person Served	per 1,000 Enrollees
1974	392.7	16	8,070	21	340
1976	588.7	23	13,335	23	520
1978	769.7	28	17,345	23	639
1980	957.4	34	22,428	23	788
1982	1,171.9	40	30,787	26	1,044
1983	1,351.2	45	36,844	27	1,227
1984	1,515.9	50	40,337	27	1,324

Source: Health Care Financing Administration, Office of Research and Demonstrations.

the full effect of PPS on post-hospital care was not yet realized, since hospitals were phasing into PPS during the first year. In addition, growth in the home health and nursing home industry may be occurring outside the Medicare sector in the private pay or Medicaid markets.

Expenditures

It was expected that, with a shift of more patients to settings outside the hospital, expenditures for long-term care providers would increase. Although expenditures for both SNFs and home health providers have increased in absolute terms since 1983, the rates of increase were lower in the post-PPS period than in the pre-PPS period (Table 6.13 and 6.14). Part of this increase may be due to other factors besides utilization, such as growth in Medicare enrollment and inflation (i.e., increased cost per home health visit or per day of SNF care).

Supply

The supply of long-term care providers is a crucial factor in determining hospitals' response to PPS. If SNFs and HHAs are not available, hospitals will find it more difficult to reduce length of stay for patients needing long-term care services.

Geographic variation in the utilization of SNF and HHA services (Table 6.15) reflects the differential availability of these services (Tables 6.16 and 6.17). While there has been an increase in the number of Medicare-certified SNFs and HHAs since the implementation of PPS, it should be noted that there are many factors that affect the supply of these long-term care providers, such as State Medicaid

Table 6.13

ESTIMATED MEDICARE PAYMENTS FOR SKILLED NURSING SERVICES
FY 1967-85

Fiscal Year	Actual Payments (in $ millions)	Percent Change	Real Payments* (in $ millions)	Percent Change
1967	147	---	149	---
1968	361	+145.6	354	+137.6
1969	416	+ 15.2	390	+ 9.9
1970	294	- 29.3	260	- 33.3
1971	216	- 26.5	182	- 30.2
1972	180	- 16.7	146	- 19.6
1973	203	+ 12.8	158	+ 8.5
1974	255	+ 25.6	183	+ 15.3
1975	279	+ 9.4	180	- 1.5
1976	318	+ 14.0	191	+ 6.4
TQ*	87	---	51	---
1977	352	---	197	---
1978	354	+ 0.6	185	- 6.1
1979	366	+ 3.4	173	- 6.3
1980	402	+ 9.8	168	- 3.3
1981	439	+ 9.2	165	- 1.7
1982	473	+ 7.7	165	+ 0.3
1983	518	+ 9.5	175	+ 5.8
1984	544	+ 5.0	177	+ 0.9
1985	590	+ 8.5	185	+ 4.6

*Transitional quarter between Federal fiscal years 1976 (ending in June 1976) and 1977 (beginning in October 1976).

*In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Table 6.14

ESTIMATED MEDICARE PAYMENTS FOR HOME HEALTH SERVICES[a]
FY 1967-85

Fiscal Year	Actual Payments (in $ millions)	Percent Change	Real Payments[b] (in $ millions)	Percent Change
1967	34	---	34	---
1968	69	+102.9	68	+ 96.4
1969	94	+ 36.2	88	+ 30.0
1970	100	+ 6.4	88	+ 0.5
1971	85	- 15.0	71	- 19.2
1972	91	+ 7.1	74	+ 3.3
1973	116	+ 27.5	90	+ 22.6
1974	151	+ 30.2	108	+ 19.5
1975	248	+ 64.2	160	+ 47.8
1976	356	+ 43.5	214	+ 34.0
TQ*	107	---	62	---
1977	478	---	267	---
1978	556	+ 16.3	291	+ 8.7
1979	649	+ 16.7	308	+ 5.8
1980	782	+ 20.5	326	+ 6.1
1981	977	+ 24.9	367	+ 12.5
1982	1,293	+ 32.3	452	+ 23.2
1983	1,683	+ 30.2	569	+ 25.8
1984	2,021	+ 20.1	656	+ 15.4
1985	2,346	+ 16.1	735	+ 12.0

*Transitional quarter between Federal fiscal years 1976 (ending in June 1976) and 1977 (beginning in October 1976).

[a]Includes payments made under both Medicare Hospital Insurance and Medicare Supplemental Medical Insurance.
[b]In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Table 6.15

VARIATIONS IN POST-HOSPITAL CARE UTILIZATION RATES BY LOCATION
FOR SELECTED DRGs
1981

DRG	Percentage of Medicare Inpatients Discharged to Skilled Nursing			Percentage of Medicare Inpatients Discharged to Home Health		
	Highest State*	Lowest State*	National Average	Highest State*	Lowest State*	National Average
014	23.2%	1.2%	13.2%	46.2%	3.0%	18.4%
210	46.0	1.4	30.2	39.7	4.5	25.3
089	7.4	0.1	5.2	21.4	2.8	19.1
127	6.0	0.1	3.4	29.0	3.2	13.6
209	23.7	2.2	14.4	53.3	5.8	24.6
296	10.1	0.3	7.4	66.7	1.5	14.4
320	25.0	0.2	5.9	34.5	1.7	13.8
182	2.7	0.1	1.6	18.4	1.2	6.5
015	8.2	0.3	3.0	28.6	0.7	9.7
236	33.3	0.8	17.2	31.4	1.8	16.3
468	9.0	0.9	4.2	22.3	2.6	12.2
243	6.0	0.2	2.6	20.7	1.8	8.6
088	5.8	0.1	2.2	28.6	3.3	8.8
294	10.0	0.3	2.8	30.7	6.3	11.4
148	15.0	0.4	4.9	30.3	3.9	19.7
122	3.7	0.2	1.9	21.6	2.0	9.8
082	9.3	0.5	2.9	27.0	2.7	12.7

*Zero and 100 percent figures excluded.

Source: The Rand Corporation.

Table 6.16

AVAILABILITY OF CERTIFIED NURSING FACILITIES* BY STATE
1981 AND 1984

State	1981 Certified Facilities	1981 Number of Beds	1981 Beds per Thousand Medicare Enrollees	1984 Certified Facilities	1984 Number of Beds	1984 Beds per Thousand Medicare Enrollees
Total	13,326	1,362,223	53.4	13,858	1,452,273	53.7
Alabama	206	20,742	47.5	213	21,398	46.6
Alaska	13	644	54.6	12	551	37.5
Arizona	25	3,217	10.4	29	3,001	10.2
Arkansas	207	19,574	57.8	214	20,535	54.2
California	1,184	114,468	47.7	1,184	110,531	42.8
Colorado	172	18,936	75.7	177	18,281	67.6
Connecticut	231	24,783	66.8	232	26,735	67.4
Delaware	26	2,789	45.9	31	3,376	50.7
Dist. of Col.	6	1,166	16.6	12	2,769	39.0
Florida	306	34,705	21.3	365	42,659	23.8
Georgia	301	30,649	59.9	324	33,813	61.3
Hawaii	34	2,516	32.4	33	2,634	29.3
Idaho	62	4,769	48.8	62	4,467	42.2
Illinois	687	90,107	71.7	723	92,951	71.0
Indiana	424	41,604	70.5	460	46,759	75.4
Iowa	427	34,118	87.1	423	35,168	87.3
Kansas	368	25,694	83.6	370	26,217	82.8
Kentucky	204	20,304	49.8	209	21,613	57.0
Louisiana	225	24,648	63.9	228	27,117	67.1
Maine	145	9,140	63.2	144	9,460	62.7
Maryland	174	20,909	53.5	190	23,594	55.6
Massachusetts	515	45,005	62.2	512	45,481	60.5
Michigan	421	46,275	49.4	431	51,172	51.6
Minnesota	454	46,325	95.0	466	49,073	96.6
Mississippi	143	12,294	43.3	152	13,852	47.2
Missouri	237	28,243	40.7	294	34,775	52.5
Montana	94	6,234	72.2	92	6,342	67.0
Nebraska	217	17,245	84.1	216	17,752	83.8
Nevada	26	2,269	32.6	27	2,389	28.3
New Hampshire	74	6,740	63.7	70	6,677	59.5
New Jersey	233	32,232	37.2	242	34,455	37.6
New Mexico	43	3,565	30.1	53	4,767	36.6
New York	570	94,124	44.0	583	97,775	44.8
No. Carolina	292	21,722	35.8	227	22,575	35.3
No. Dakota	83	6,570	79.3	82	6,771	78.7
Ohio	856	70,799	59.8	881	77,052	61.7
Oklahoma	363	28,330	77.3	369	28,367	76.0
Oregon	178	14,868	48.1	182	14,836	44.3
Pennsylvania	556	68,969	44.7	608	79,410	48.7
Rhode Island	106	8,545	67.5	107	9,179	68.9
So. Carolina	123	10,880	37.8	131	12,375	39.1
So. Dakota	114	7,880	84.9	117	8,017	83.9
Tennessee	229	24,540	47.9	248	28,163	52.0
Texas	976	100,059	74.4	969	96,940	67.7
Utah	80	5,214	46.5	77	5,385	43.6
Vermont	44	3,982	50.3	45	3,121	50.4
Virginia	163	20,428	40.6	179	25,338	46.3
Washington	262	24,872	56.7	277	32,582	58.5
West Virginia	74	5,721	24.2	82	7,789	31.7
Wisconsin	436	53,617	92.7	447	52,277	86.7
Wyoming	26	1,904	49.2	27	2,059	49.8

*Certified as Medicare SNF, Medicaid ICF/SNF, or both.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

TABLE 6.17 Nurses[1] employed by participating home health agencies and enrollees per nurse by census division - 1985

Census Division	Nurses Employed 1985	Enrollees per nurse[2] 1985
United States	41930	726
New England	3347	529
Middle Atlantic	6691	788
East North Central	5820	917
West North Central	3381	735
South Atlantic	6475	829
East South Central	3446	580
West South Central	4144	691
Mountain	1619	842
Pacific	7008	564

1 Comprises registered professional and licensed practical nurses.

2 A lower ratio of enrollees per nurse indicates greater supply of nursing staff providing home health services.

reimbursement policies and certificate of need laws.

Nursing Homes: The number of Medicare-certified SNFs has grown steadily since 1981 (see Table 6.18). It should be noted that the number of facilities has largely increased due to application for certification by existing units, rather than by construction of new ones. With the increase in Medicare-certified facilities over a wider geographic area since PPS, access for Medicare patients may have improved. However, Medicare-certified facilities still tend to be heavily concentrated in a few States. Over 50 percent of all Medicare-certified facilities are located in seven States: California, New York, Pennsylvania, Ohio, Florida, Illinois, and Michigan.

Between 1981 and 1984, the number of hospital-based facilities that were certified for Medicare and/or Medicaid increased from 761 to 893 (17 percent). There was also a 15 percent increase in the number of certified beds in these facilities, from 67,663 to 77,750 beds. This growth in hospital-based facilities may improve access for Medicare beneficiaries, since these facilities accounted for a large share of Medicare patient days relative to their numbers. For example, in 1980, hospital-based SNFs accounted for only 14 percent of Medicare-certified facilities and 10 percent of beds in Medicare-certified facilities, but 20 percent of Medicare SNF patient days.

Institutions may contain distinct-part units that are Medicare-certified or Medicaid-certified (or both). While there has been a moderate increase in the total number of beds in facilities certified by Medicare and/or Medicaid between 1981 and 1986 (Table 6.18), the number of beds in Medicare-certified facilities alone has declined. However, access to beds in in Medicare-certified SNFs by Medicare-covered patients is not likely to have been affected.

Table 6.18

GROWTH IN NUMBER OF MEDICARE CERTIFIED SNFs
AND MEDICARE CERTIFIED SNF BEDS
1981-85

	Medicare Certified Facilities	Annual Percent Change	Beds in Medicare Certified SNFs	Annual Percent Change	Total Certified Beds*	Annual Percent Change
May 1981	5,197	---	457,674	---	610,742	---
May 1984	5,908	+ 4.4%	527,407	+15.2%	705,392	+ 4.9%
December 1985	6,652	+ 7.8	410,332	-14.7	744,542	+ 3.5

*Medicare and/or Medicaid.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 6.19

GROWTH IN NUMBER OF MEDICARE CERTIFIED HHAs
1972-85

Year	Medicare Certified HHAs	Percent Change*
1972	2,212	---
1977	2,496	+ 2.6%
1979	2,858	+ 7.3
1982	3,639	+ 9.1
1983	4,258	+17.0
1984	5,274	+23.9
1985	5,964	+13.1

Source: Health Care Financing Administration, Office of Research and Demonstrations.

This is due to the fact that the percentage of beds in these facilities that are actually used for Medicare-covered stays is very small (only six percent nationally in 1984). Because of this low rate of Medicare utilization, the number of Medicare-certified SNFs, rather than the number of beds in those facilities, may be a better indicator of access.

In general, SNFs have not been geared to Medicare short-term skilled or rehabilitative care, because demand has been fairly limited. However, with the increased number of Medicare SNF patients, SNFs may respond by changing their staffing and the types of services provided to accommodate more patients. Georgetown University, under a HCFA grant, is currently conducting a survey of nursing facilities to examine changes in staffing and services offered as a result of PPS. Results are expected in mid-1987.

Home Health Agencies: The number of Medicare-certified HHAs has grown significantly since 1983, increasing from 4,258 to 5,964 in 1985, or approximately 20 percent per year (Table 6.19).

Two major trends have occurred with respect to HHAs: (1) a change in distribution of agencies by type of ownership and (2) a change in the locus of the provider from free-standing to institution-based agencies (Table 6.20)—although the majority of HHAs are still free-standing. The share of the Medicare home health market controlled by voluntary and public sector entities (Voluntary Nursing Associations, combined voluntary/Government agencies, and official Government agencies) decreased from 83 percent in 1972 to approximately 30 percent in 1985. At the same time, the market share of the proprietary and private non-profit

Table 6.20

Medicare Certified Home Health Agencies by Auspices

1972 and 1982 - 85

Type of Ownership	1972[1] No.	1972[1] Percent	1982[1] No.	1982[1] Percent	1983[1] No.	1983[1] Percent	1984[1] No.	1984[1] Percent	1985[1] No.	1985[1] Percent
VNA	531	24.0	517	14.2	520	12.2	525	10.0	518	8.7
Combined Voluntary/ Government	55	2.5	59	1.6	58	1.4	59	1.1	57	1.0
Government	1255	56.7	1211	33.3	1230	28.9	1226	23.2	1217	20.4
Rehabilitation Facility-Based	11	0.5	16	0.4	22	0.4	22	0.4	20	0.3
Hospital-Based	231	10.4	507	13.9	579	13.6	894	17.0	1260	21.1
SNF-Based	7	0.3	32	0.9	136	3.2	175	3.3	129	2.2
Proprietary	43	1.9	628	17.3	997	23.4	1596	30.3	1927	32.3
Private Non-Profit & Other	79	3.6	669	18.4	719	16.9	777	14.7	836	14.0
TOTAL	2212	100.0	3639	100.0	4258	100.0	5274	100.0	5964	100.0

[1] As of December 31.

Source: HCFA Provider of Service File

agencies increased from 5.5 percent to 46 percent. This change is largely attributed to the Omnibus Reconciliation Act of 1980, eliminating the requirement that proprietary HHAs could participate only if they were licensed by States that had licensure laws for proprietary agencies. With the shift in the home health industry toward proprietary and private non-profit agencies, there may be important implications for Medicare expenditures, since these types of agencies tend to have higher charges and, presumably, costs (Table 6.21).

Table 6.20 shows that the number of hospital-based HHAs increased more than five-fold from 1972 to 1985 (from 231 to 1,260). In particular, there has been a large increase in the number of hospital-based HHAs since PPS started, with the number more than doubling between 1983 and 1985, from 579 facilities to 1,260 facilities. Similarly, SNF-based HHAs have also grown significantly, from seven agencies in 1972 to 129 in 1985. However, the growth of SNF-based HHAs since the advent of PPS has not been as dramatic as that of hospital-based HHAs, and this growth may have stabilized: between 1983 and 1984, the number grew from 136 to 175 agencies, but then decreased to 129 in 1985.

One reason for the above-referenced growth in the number of hospital-based HHAs would be that hospitals have ready access to patients in need of home health services. A survey by Frost and Sullivan showed that 60 percent of HHA referrals come from hospital discharge planners. Another reason is that,under PPS, direct provision of home health care might become relatively more attractive, since a hospital-based agency can permit a hospital to shorten the inpatient stay that is subject to fixed reimbursement, while capturing additional cost-based home health payments.

In addition to the changes in the numbers of HHAs since PPS, there have been changes in HHA staffing and the types of services provided. Between 1982 and

Table 6.21

Medicare Home Health Agency
Characteristics by Provider Type
1984

	Total	VNA	Government and Voluntary Combined	Government	Hospital Based	Proprietary	Private Non-Profit	Other
Number of agencies	5274	525	52	1226	894	1596	777	197
Average Number of Patients per agency	287	895	327	175	270	193	310	117
Average visits per patient	26.6	25.8	20.1	22.6	21.8	32.0	30.0	26.7
Average charge per visit	$49	$43	$44	$39	$58	$53	$51	$58
Average charge per patient	$1307	$1112	$897	$874	$1271	$1701	$1535	$1557

Source: HCFA Provider of Service File

1984, the average number of full-time equivalent personnel employed by HHAs increased from 19.2 to 29.7, almost 50 percent. In particular, licensed practical nurses, occupational therapists, and speech pathologists/audiologists have shown the most growth (Table 6.22). All HHAs must offer skilled nursing services to their patients in order to be certified by Medicare. The majority of HHAs also provide home health aide and physical therapy services as well. Between 1982 and 1985, the proportions of HHAs providing occupational therapy, nutritional guidance, and pharmaceutical service have increased rapidly (see Table 6.23).

Swing-Bed Hospitals and Hospices: There are two other long-term care settings into which hospitals may discharge their patients. Both are relatively new programs, and have grown rapidly since their establishment. The national swing-bed program, which became effective in July 1982, allows rural hospitals with fewer than 50 beds to receive reimbursement for long-term care provided in acute care beds. The number of such hospitals approved for swing-bed care increased from 149 to 771 between 1983 and 1985 (see Table 6.24). This number represents slightly more than 10 percent of all hospitals in the U.S. and about one-third of the eligible hospitals in rural areas. Three States account for almost a third of all the approved swing-bed hospitals: Iowa (92), Kansas (66) and Minnesota (82).

The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) authorized the reimbursement of covered services in facilities independently certified as hospice providers. The number of hospices certified for Medicare grew from 76 in 1983 to 227 in 1985 (see Table 6.25). There is geographic variation in the location of hospice providers, and almost 10 percent of the hospices are located in one State: Florida.

Table 6.22

HHA STAFFING LEVELS BY SPECIALTY
1982-84

Specialty	Average FTE Personnel 1982	1984	Percent Change
Registered Nurse	7.1	7.6	+ 7.0%
Licensed Practical Nurse	0.9	3.5	+288.9
Physical Therapist	1.1	2.4	+118.2
Occupational Therapist	0.4	1.5	+275.0
Speech Pathologist/ Audiologist	0.6	2.6	+333.3
Home Health Aide	4.8	6.3	+ 31.3
Other	4.3	5.8	+ 34.9
TOTAL	19.2	29.7	+ 54.7

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 6.23

CHANGE IN PROPORTION OF HOME HEALTH AGENCIES
PROVIDING VARIOUS TYPES OF IN-HOME SERVICES
1982-85

Type of Service	January 1982 Number	January 1982 Percent	December 1985 Number	December 1985 Percent	Percent Change
Skilled Nursing	4,270	100.0%	5,982	100.0%	0.0%
Physical Therapy	3,546	83.0	5,229	87.4	+ 5.3
Occupational Therapy	2,104	49.3	3,437	57.5	+16.6
Speech Therapy	2,793	65.4	4,310	72.1	+10.2
Medical Social Services	2,255	52.8	3,539	59.2	+12.1
Home Health Aides	4,036	94.5	5,793	95.7	+ 1.3
Interns and Residents	32	0.8	67	1.1	+37.5
Nutritional Guidance	1,016	23.8	1,683	28.1	+18.1
Pharmaceutical Service	272	6.4	592	9.9	+54.7
Appliances and Equipment	983	23.0	1,356	22.7	- 1.3

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 6.24 Growth in Number of Hospitals Approved for Swing Bed Care

Year	Hospitals	Percent Change
1983	149	---
1984	471	+216.1%
1985	771	+63.7%

Swing bed program effective July 1982; only hospitals in a non-urbanized area with fewer than 50 beds in use are eligible.

Source: University of Colorado, Contract No. HCFA-500-83-0051 "National Swing Bed Program Evaluation"

Table 6.25 Growth in Number of Medicare Certified Hospices

Year	Hospices	Percent Change
1983	76	---
1984	153	+101.3%
1985	227	+ 48.4%

Hospice program efective November 1983

Source: HCFA Provider of Service File

Patients Served by Long-Term Care Providers

One way to examine changes in patients served by long-term care providers is to analyze patient assessment data. However, these data, such as functional status, are not required by the Medicare program and, thus, are not routinely collected. Nevertheless, there are several studies being conducted which will provide some information of this type.

The University of Colorado is attempting to determine whether patient case mix in nursing homes and HHAs in 12 States has intensified since PPS. This study will also provide an assessment of the impact of PPS on private pay as well as on Medicare and Medicaid case mix and, to some extent, an assessment of potential cost shifting among public and private payers for long-term care due to PPS. Results are expected in late 1987. In addition, a nationwide survey of 5,000 HHAs is being conducted by the American Federation of Home Health Agencies to assess service-level changes from January 1983 to March 1985. Respondent HHAs will be asked to match patients from January-February in each of the three years according to primary DRG codes, and itemize the services received by the patients. Results are expected in late 1986.

Another study is using facility-level information available from the Medicare Medicaid Automated Certification System (MMACS) to examine this issue. A one-day census of the percentage of patients in each facility with 12 different characteristics is being analyzed for approximately 1,300 facilities for 1981, 1984, and 1985. Changes in level of dependency between 1981 and 1984 and between 1984 and 1985 will be examined for each facility by looking at three patient characteristics: completely bedfast, independent ambulation and full assistance with eating.

Changes in special nursing procedures required by patients in facilities will be assessed on the basis of three characteristics: indwelling catheter, special skin care, and intravenous or blood therapy. Three other patient characteristics--incontinence, decubitus ulcers, and disorientation--are indicators of problems that require extra staff time. The results of the study will be available for the next annual report.

Discussion

Thus far, other providers appear to be successfully adapting to the PPS environment. In FY 1984, the PPS implementation and transition year, there was a general slowing in growth of incurred benefit payments across all providers. In FY 1985, payments to other providers increased in both nominal and real terms. The rate of increase in incurred payments for SNF care and outpatient hospital care again is increasing. Physician and home health care rates of increase continued to slow, likely because of the fee freeze and factors other than PPS.

Physicians appear to have been encouraged to discharge patients sooner under PPS. Physicians believe that PPS has had a generalized impact on their practices. Medical and surgical services are increasingly being provided in offices and outpatient hospital settings. Office locations gained medical and surgical services about equally. Outpatient hospital gains were primarily increases of surgical services. These were more complex or at least more expensive services. Both total community and Medicare visits to hospital clinics and emergency rooms declined between CYs 1983 and 1984, but the Medicare share of visits has not changed. Despite decreases in visits, outpatient services appear to be a continuing source for profit, as revenues per visit have increased more rapidly since PPS.

Similarly, a survey of the blood banking industry suggests that Medicare's PPS has become a new economic factor in the blood banking industry. The industry and hospitals appear to be adapting in ways that have not jeopardized blood supplies or services either quantitatively or qualitatively.

As previously stated, we expected to see decreased use of hospital services with corresponding increases in expenditures and an expansion in the supply of HHAs and SNFs. We found significant increases in the proportion of Medicare patients discharged home on self-care or discharged home with home health care support. This suggests that shorter Medicare stays are being supplemented with more use of HHAs. Discharges to SNFs increased in the expected direction but not significantly. The number of admissions has increased, but the number of covered days has declined. The number of Medicare-certified facilities increased dramatically, but likely because of the certification of existing facilities, rather than an increase in the number of existing SNFs.

The number of persons served by HHAs has increased dramatically, but the rate of increase is lower than for the pre-PPS period. The average number of visits per person served did not change between 1983 and 1984. The increase in the number of Medicare-certified HHAs represents an increase in existing providers. Two trends were noted: (1) there has been a change in the distribution of HHA sponsorship or ownership, particularly an increase in investor-owned agencies, and (2) although the majority of HHAs are free-standing, the proportion of agencies that are hospital- and SNF-based has increased.

This may have implications for program expenditures, since both investor-owned and hospital-based agencies tend to have higher charge (and cost) structures. In addition to changes in the number of agencies, staffing has increased and the range or mix of services has been diversified.

On balance, the impact of PPS on other providers in the short-run seems to have been positive. Other providers appear to have responded to an increasingly competitive market with new facilities, increased staffing, and diversification of services. Thus, the availability of non-hospital services does not appear to have been compromised in the short run.

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Chapter 7

IMPACT ON MEDICARE PROGRAM OPERATIONS AND EXPENDITURES

Overview

Chapters 3 through 6 have presented evidence on the impact of PPS on hospitals, Medicare beneficiaries, other payers for inpatient hospital services, and other providers of health care. These are important considerations in the evaluation of prospective payment. However, the success of the new system also depends greatly on the smoothness with which it is implemented, so as to minimize the disruptions and uncertainty that can accompany this process. As carefully designed as a system may be, its impact may be greatly limited if its operational aspects do not proceed smoothly. For this reason, several operational aspects of PPS are discussed in this chapter.

Also, it must be remembered that the primary concern that led to the implementation of the PPS was the need to constrain the depletion of the Medicare Trust Funds so that the Medicare program could continue to function. As discussed earlier, it was predicted prior to the enactment of PPS that the Medicare program would be insolvent by as early as the end of this decade. In response to this impending insolvency, PPS was put into place in the hope that, through the provision of appropriate behavioral incentives, hospitals and, indirectly, other health care providers would be encouraged to increase the efficiency with which they operate. Thus, it was anticipated that the cost of health care could be controlled without diminishing the quality of care or impeding access to necessary care. This chapter, then, also examines the impact of the new system on the expenditures that it was enacted to control.

Matrix Study Issues

The PPS Study Issues Matrix described in Chapter 1 presents a listing of a number of research hypotheses on the impact of PPS on overall Medicare program operations and expenditures in order to provide a framework for the PPS evaluation effort. These study issues, reproduced in Table 7.1, describe both the effects that were intended by those who designed and implemented the new system and other anticipated effects that may not have been intended. The specification of these hypothesized effects can be especially useful in determining the appropriate policy response to preliminary evidence on the impact of PPS. If the anticipated benefits listed in Table 7.1 are consistently observed under PPS, then we can be reasonably confident that, at least, the new payment system has not prevented these effects from occurring. In the event that the hypothesized problems occur, corrective measures will be indicated regardless of the precise extent to which these effects can be formally attributed to the new system.

Chapter Organization

This chapter describes the effects of PPS on the operations of the Medicare program by considering two aspects of these operations: the extent to which the nation's hospitals are participating in the new system, and the medical review activities that are an integral part of the maintenance of both payment and service integrity under PPS.

The remainder of the chapter describes trends in Medicare benefit payments since the beginning of the program with an emphasis on the comparison of rates of change prior to and after PPS. This analysis is based primarily on estimates made by HCFA's Office of the Actuary (OACT) of incurrd benefit payments by type of provider.

Table 7.1

PPS STUDY ISSUES:
HYPOTHETICAL IMPACT ON MEDICARE PROGRAM OPERATIONS AND EXPENDITURES

Economic Impact		
—Anticipated Benefits:	o	Slower rate of growth of hospital expenditures.
	o	Improvement in solvency of the program overall.
	o	More predictable program outlays.
—Other Potential Consequences:	o	Increased growth in expenditures for capital and other cost categories reimbursed on a "pass-through" basis.
	o	Increased growth in expenditures on substitutes for inpatient hospital care.
	o	Increased growth in expenditures for post-hospital care.
Impact on the Quality of Care		
—Anticipated Benefits:	o	More efficient provision of both hospital and overall health care.
—Other Potential Consequences:	o	Replacement of quality with financial considerations as the objective of health care providers.
Impact on Access to Care		
—Anticipated Benefits:	o	Reduction in the cost of hospital care.
	o	Encouragement of efficiency in the management of health care providers.
	o	Promotion of the success of efficient providers of hospital care.
	o	Improvement in the solvency of the program overall.
—Other Potential Consequences:	o	Possible reluctance to admit Medicare patients or certain groups of Medicare patients.
	o	Increased rate of hospital closings, particularly in underserved areas.

Program Operations

The integrity of any new policy, especially one representing a change as fundamental and far-reaching as that imposed by PPS, depends upon its successful implementation--the way that program changes are carried out and the extent to which those changes are accepted by the affected individuals and organizations. The 1984 annual report on the impact of PPS (U.S. Department of Health and Human Services, 1985) described the process of implementing the new system, including the phase-in of Federally-determined prospective payment rates, the specification of criteria by which certain types of hospitals could be excluded from the new system's payment provisions, and the extent of medical review activity conducted under PPS. In this chapter, data on the implementation of the program and the extent of medical review activity are updated through the end of FY 1985, the second year of Medicare prospective payment.

Implementation

As shown in Table 7.2, there were an estimated 5,343 short-stay general hospitals participating in PPS as of September 30, 1985. This represented about 80 percent of all short-stay general and specialty hospitals and separate cost entities eligible for Medicare payment at that time. The number of PPS hospitals reported as of September 30, 1984 was 5,405; this apparent decrease in participation in the new system appears to be due primarily to an increase in the number of hospitals that had obtained certification as excluded (psychiatric, rehabilitation, alcohol/drug, long-term, and children's) facilities under the provisions of the PPS.

Table 7.2 also shows that approximately nine percent (604) of all Medicare hospitals were located in the four States with waivers from PPS during FY 1985—

Table 7.2

STATUS OF MEDICARE HOSPITALS UNDER THE PPS
FY 1984 AND FY 1985

Status	Number of Hospitals* As of September 30, 1984	As of September 30, 1985
PPS	5,405	5,343
Waiver States:	552	545
• Maryland	57	56
• Massachusetts	119	118
• New Jersey	96	96
• New York	280	275
Outlying Areas (Puerto Rico, Virgin Islands, Guam, American Samoa)	58	59
Excluded Hospitals:		
• Psychiatric	439	481
• Rehabilitation	49	68
• Alcohol/Drug	25	28
• Long-term	83	86
• Children's	47	53
Excluded Units:		
• Psychiatric	722	733
• Rehabilitation	308	386
• Alcohol/Drug	216	326
Special Consideration:		
• Sole Community Hospitals	304	359
• Regional Referral Centers	6	158
• Cancer Treatment and Research Centers	4	6
• Hospitals that previously allowed extensive Part B billing	6	4
• Christian Science Sanitoria	22	23

*Including separate cost entities.

Source: Health Care Financing Administration, Bureau of Program Operations, Bureau of Data Management and Strategy, and Health Standards and Quality Bureau.

Maryland (56), Massachusetts (118), New Jersey (96), and New York (275)—and in "outlying areas" (59) that also are exempt from prospective payment--Puerto Rico, the Virgin Islands, Guam, and American Samoa. During FY 1986, Massachusetts and New York joined the nationwide system and short-stay general hospitals in those States are paid subject to the provisions of prospective payment.

As stated above, there was an increase between FY 1984 and FY 1985 in the number of hospitals certified as qualifying for specific exclusion from PPS, from about 9.7 percent to about 12 percent of all Medicare hospitals. This increase is as would be expected: as more hospitals gained more experience with and knowledge of the new payment system, they became more familiar with the PPS provisions and also better able to reach conclusions about their relative levels of payment under the alternative classifications for which they might be eligible. As this happened, there was an increase in the number of hospitals filing for exclusion under the special provisions of the PPS legislation. Also, the process for granting these exclusions could be expected to have been refined in the intervening year. Table 7.2 shows that there was a similar increase in the number of distinct-part units excluded from PPS.

Among the hospitals participating in PPS, there are several categories for which special treatment was provided in the legislation. These categories are:

- Sole community hospitals, which are, by reason of factors such as isolated location, weather conditions, travel conditions, or absence of other hospitals, determined by the Secretary of Health and Human Services to be the sole source of inpatient hospital services reasonably available to Medicare Part A beneficiaries in a geographic area;

- Short-term acute care hospitals that meet the requirements for special treatment as referral centers;
- Hospitals involved extensively in treatment for and research on cancer; and
- Hospitals that previously allowed extensive direct billing under Part B.

In addition, Christian Science sanitoria are eligible for special treatment under PPS.

The increase in the number of hospitals accorded special treatment was concentrated in two categories: sole community hospitals, the number of which increased from 304 to 359 (18 percent) and regional referral centers, the number of which increased from 6 to 158 (2,533 percent). In addition to the factors described above in the discussion of the increase in excluded hospitals and units, the increases in sole community hospitals and regional referral centers can probably be attributed to a change in the definitions of these two categories, which allowed more hospitals to be considered for exclusions.

Peer Review Organizations

TEFRA replaced the previous Professional Standards Review Organization (PSRO) program with the Utilization and Quality Control Peer Review Organization (PRO) program. The PRO program is designed to determine the medical necessity and quality of inpatient hospital services provided to Medicare patients. The PROs review the completeness, adequacy, and quality of inpatient hospital services, and the appropriateness of admissions and discharges. For services provided under PPS, PROs also review the validity of diagnostic information provided by the hospital and

the appropriateness of care provided to cases for which additional outlier payments[1] are sought.

During the fourth quarter of FY 1984 and the first quarter of FY 1985, all 141 existing PSROs were phased out, and 54 PRO contracts were awarded—one for each of the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam/American Samoa. The new PROs represent an effort to intensify the review of Medicare claims, in order to ensure that the care rendered by the hospital is necessary, appropriate, and of acceptable quality. Each PRO was initially required to be accountable for three admission and five quality objectives (with certain exceptions in PPS waiver States and exempt areas):

Admission Objectives

- Shifting of inappropriate inpatient admissions to outpatient settings.
- Reduction of unnecessary admissions and procedures.
- Reduction of unnecessary admissions by specific hospitals and physicians.

Quality Objectives

- Reduction of unnecessary admissions.
- Reduction of mortality rates for specific "problem" procedures.
- Reduction of unnecessary invasive procedures.
- Assurance that patients will receive complete treatment and adequate ancillary services.
- Reduction of post-procedural complications.

[1] For a definition of outliers, see Chapter 2.

In addition to these specific objectives, the PROs monitor the validity of coding used in DRG assignments.

If the PRO determines that the hospital has permitted unnecessary admissions, misrepresented billing information, or billed beneficiaries inappropriately, HCFA may deny payment in whole or in part with respect to the services provided to the beneficiary. In addition, a determination by HCFA that there is a pattern of inappropriate admissions or billing practices that have the effect of circumventing PPS provisions may also be referred to the Office of the Inspector General, DHHS, for possible termination of the hospital's provider agreement or monetary penalties.

The more stringent requirements of the PRO arrangement—both in terms of the hospital's accountability to the PRO and the PRO's accountability to HCFA—were devised to encourage a more aggressive approach to monitoring the quality of care than was taken by the previous PSROs.

Current evidence is that the PROs are actively pursuing their mandated responsibilities. Over 850 cases are pending in which sanctions against hospitals and/or physicians are being considered; nine cases have been forwarded to the Office of the Inspector General and, in one case, a physician has been barred from Medicare participation for one year.

Actions are also being taken to expand the scope of provider profiling by initiating a series of PRO "quality screens" requiring 100 percent review of discharges meeting certain criteria, and 100 percent review of readmissions occurring within 15 days after a previous related discharge (previously, review had been limited to readmissions within seven days). Pilot projects are underway in seven States to establish a paradigm for PRO review of premature discharges.

Since the PRO contracts are two years in duration, a second round of contracts

will be signed during the fourth quarter of FY 1986 and the first quarter of FY 1987. In designing the scope of work for this new round of PRO contracts, increased emphasis has been placed on the reimbursement incentives provided by PPS, and the area-specific utilization and quality objectives to be specified by each PRO can be designed to fit the needs that have become more apparent as the new system develops.

Medical Review Activities

Table 7.3 presents data on the volume of medical review activities conducted by the PROs (and other medical review entities until the PRO program was fully in place) since the beginning of prospective payment in FY 1984. A total of 4,754,403 PPS admissions had been subjected to medical review through the end of FY 1985--37 percent of all the PPS admissions reported during that period. Of those admissions reviewed, 2.6 percent had been denied.

Given the incentive to transfer patients from short-stay beds to units not paid under PPS (see Chapter 3), transfers within the hospital to exempt units are reviewed for appropriateness. About 43,000 such transfers were reviewed during the first two years of PPS; about 4.1 percent of these cases were denied. Similarly, about 101,000 transfers between PPS hospitals and other hospitals were reviewed during FY 1984 and FY 1985, of which 1.7 percent were denied.

The use of the hospital discharge as the unit of payment under PPS was expected to provide two incentives that might result in an increase in readmissions: if hospitals, in attempting to shorten stays, tended to discharge their patients prematurely, then the rate of readmissions would be expected to rise, as patients who were not fully recovered would have to be readmitted for further care; and, if hospitals attempted to increase their payment for compound procedures (such as

Table 7.3

PPS MEDICAL REVIEW ACTIVITY

Admissions	FY 1984	FY 1985	Total
Total PPS Inpatient Hospital Admissions Reported	3,627,678	9,216,514	12,844,192
Total PPS Admissions Reviewed	1,110,974	3,643,429	4,754,403
Percentage of Total PPS Admissions Reviewed	30.6%	39.5%	37.0%
Total PPS Admissions Denied	27,639	97,761	125,400
Denial Rate for PPS Admissions	2.5%	2.7%	2.6%
Transfers			
Psychiatric Unit Transfers Subjected to Medical Review	2,682	6,095	8,777
Psychiatric Unit Transfers Denied	75	186	261
Denial Rate for Psychiatric Unit Transfers	2.8%	3.1%	3.0%
Regional Office Referrals	35	53	88
Rehabilitation Unit Transfers Subjected to Medical Review	7,056	15,486	22,542
Rehabilitation Unit Transfers Denied	457	414	871
Denial Rate for Rehabilitation Unit Transfers	6.5%	2.7%	3.9%
Regional Office Referrals	38	18	56
Alcohol/Drug Unit Transfers Subjected to Medical Review	146	668	814
Alcohol/Drug Unit Transfers Denied	17	24	41
Denial Rate for Alcohol/Drug Unit Transfers	11.6%	2.6%	5.0%
Regional Office Referrals	4	0	4

Table 7.3

PPS MEDICAL REVIEW ACTIVITY
(cont.)

	FY 1984	FY 1985	Total
Transfers (cont.)			
Swing Bed Transfers Subjected to Medical Review	2,006	9,316	11,322
Swing Bed Transfers Denied	104	499	603
Denial Rate for Swing Bed Transfers	5.2%	5.4%	5.3%
Regional Office Referrals	26	81	107
Transfers from a PPS Hospital to Any Other Hospital			
Transfers Reviewed	30,776	69,883	100,659
Transfers Denied	744	978	1,722
Denial Rate for Transfers	2.4%	1.4%	1.7%
Regional Office Referrals	353	1,184	1,537
Readmissions within Seven Calendar Days of Discharge from a PPS Hospital			
Readmissions Reported	97,262	244,692	341,954
Readmissions Reviewed	84,915	180,351	265,266
Percentage of Readmissions Reviewed	87.3%	73.7%	77.6%
Readmissions Denied	3,234	4,710	7,944
Denial Rate for Readmissions	3.8%	2.6%	3.0%
Regional Office Referrals	1,223	4,369	5,592

Table 7.3

PPS MEDICAL REVIEW ACTIVITY
(cont.)

Procedure Review	FY 1984	FY 1985	Total
Cases Involving Pacemaker Insertions Subjected to Medical Review	17,601	48,001	65,602
Cases Involving Pacemaker Insertions Denied	258	417	675
Denial Rate for Cases Involving Pacemaker Insertions	1.5%	0.9%	1.0%
Cases Involving Other Procedures Subjected to Medical Review	8,752	124,231	132,983
Cases Involving Other Procedures Denied	210	3,888	4,098
Denial Rate for Cases Involving Other Procedures	2.4%	3.1%	3.1%
Regional Office Referrals	22	95	117
Outlier Cases			
Day Outlier Cases Approved	47,311	72,753	120,064
Outlier Days Approved	668,881	1,029,382	1,698,263
Outlier Days Denied	79,566	99,480	179,046
Percentage of Outlier Days Denied	10.6%	9.7%	10.5%
Cost Outlier Cases Approved	20,062	51,795	71,857
Cost Outlier Charges Approved (in thousands)	$ 145,461	$679,062	$ 824,522
Cost Outlier Charges Denied (in thousands)	$ 6,512	$ 35,383	$ 41,895
Percentage of Cost Outlier Charges Denied	4.3%	5.2%	5.1%

Table 7.3

PPS MEDICAL REVIEW ACTIVITY
(cont.)

DRG Validation	FY 1984	FY 1985	Total
Random Sample Cases Reviewed for DRG Validation	330,167	637,757	967,924
Cases Reviewed for Other Reasons	402,379	1,874,357	2,276,736
Total DRG Validation Reviews	732,546	2,512,114	3,244,660

Source: Health Care Financing Administration, Health Standards and Quality Bureau.

bilateral hip replacement) by creating two admissions where only one would be appropriate, readmissions would also tend to rise. For this reason, the PROs paid close attention to readmissions within seven days of a previous discharge from a PPS hospital. Over 265,000 such cases were reviewed--77.6 percent of all readmissions reported. The denial rate for readmissions was 3.0 percent through the end of FY 1985.

Special attention was also given to cases that involve certain surgical procedures. As Table 7.3 shows, about 66,000 cases involving pacemaker insertions were reviewed during the first two years of PPS, with about one percent of these cases denied. Another 133,000 cases involving other procedures were reviewed, with a 3.1 percent denial rate.

As mentioned above, outlier cases are also subject to special review by the PROs. About 120,000 day (length of stay) outlier cases had been reviewed during the first 2 years of PPS involving almost 1.9 million outlier days. Of the total number of outlier days reviewed, 10.5 percent were denied by the PROs. About 72,000 cost outlier cases were reviewed, involving over $800,000 in outlier charges; of these charges, 5.1 percent were denied by the PROs.

Finally, extensive DRG validation efforts were reported by the PROs. almost one million cases were sampled for DRG validation, and almost 2.2 million additional cases reviewed for other reasons were subjected to DRG validation. Thus, a total of 3.2 million cases--over 25 percent of all PPS cases reported during the period--were reviewed in this way.

Evaluation of PRO Performance

As the PROs continue to evaluate the performance of hospitals and other

providers under PPS, HCFA continues to evaluate the performance of the PROs. The evaluation of the PROs consists of analysis of HCFA data to compare each PRO's performance to its contractual objectives; self-evaluation reports required of each PRO; validation of PRO performance by the HCFA regional offices; and the findings of the evaluation of the PROs conducted under the "SuperPRO" contract let by HCFA. As the first round of PRO contracts expires, HCFA can, based on this evaluation, offer current PROs an opportunity to renew their contracts or open the new contracts to competition from other offerors.

Medicare Benefit Payments

The 1984 annual report described trends in Medicare program outlays from the beginning of Medicare through the first year of prospective payment. In this year's report, however, the data presented are estimates of incurred benefit payments rather than actual cash outlays. The reason for this change is that, while program outlays are reported by the Department of the Treasury and, thus, have the advantage of being based on actual dollar flows,[2] their utility in measuring year-to-year changes in the cost of the Medicare program is compromised by their vulnerability to the administrative vagaries of the payment process. That is, if, due to administrative decisions or other factors that affect the flow of funds, there is an uneven lag between the provision of services and the receipt of bills or between the receipt of bills and their payment by the intermediaries, the rate of change of

[2] Although total cash outlays are reported for the Medicare Hospital Insurance and SMI programs as a whole, they are not broken out by type of provider. The data on payments by type of provider that were presented in the 1984 annual report were based on estimates provided by HCFA's OACT.

outlays over time will be affected, even though there is no programmatic reason for this change. The use of estimated incurred benefit payments allows for the examination of trends over time, independent of these administrative factors, in order to provide more accurate information about the true effect of changes in the Medicare program on the volume of payments for which it is responsible.

Inpatient Hospital Services

Table 7.4a illustrates the growth of estimated incurred Medicare benefit payments for inpatient hospital services over time, since the beginning of the Medicare program. As shown in this table, inpatient hospital payments rose from an estimated $2.7 billion in FY 1967 to over $37.1 billion in FY 1983. During this time, the rate of growth of this largest component of Medicare expenditures was lower than 10 percent only once in 17 years (in 1973, when the Nixon Administration's Economic Stabilization Program included mandatory limits on increases in wages and prices in many industries), while several times exceeding 20 percent.

In FY 1984—the first year of PPS—inpatient hospital payments increased by only 8.6 percent; this was the smallest percentage increase in the history of the Medicare program until that time. In FY 1985, however, inpatient hospital payments increased by an estimated 5.5 percent—a smaller increase by far than the previous year and barely more than half of the lowest rate of increase prior to PPS.

As Table 7.4b shows, the percentage of total Medicare benefit payments accounted for by inpatient hospital services had dropped before PPS from a peak of 70.1 percent in FYs 1972-73 to only 65.4 percent by FY 1983. After two years of prospective payment, the share of inpatient hospital payments was at an all-time low of 62.7 percent.

Table 7.4a

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS BY TYPE OF PROVIDER
FY 1967-85
(in $ millions)

Fiscal Year	Inpatient Hospital Amount	Inpatient Hospital Pct. Change	Outpatient Hospital[a] Amount	Outpatient Hospital[a] Pct. Change	Physician[b] Amount	Physician[b] Pct. Change	Skilled Nursing Amount	Skilled Nursing Pct. Change	Home Health[c] Amount	Home Health[c] Pct. Change
1967	2,729	---	25	---	1,048	---	147	---	34	---
1968	3,464	+ 26.9	43	+ 72.0	1,309	+ 24.9	361	+145.6	69	+102.9
1969	4,200	+ 21.2	80	+ 86.0	1,489	+ 13.8	416	+ 15.2	94	+ 36.2
1970	4,663	+ 11.0	115	+ 43.8	1,600	+ 7.5	294	- 29.3	100	+ 6.4
1971	5,355	+ 14.8	149	+ 29.6	1,726	+ 7.9	216	- 26.5	85	- 15.0
1972	5,937	+ 10.9	172	+ 15.4	1,900	+ 10.1	180	- 16.7	91	+ 7.1
1973	6,513	+ 9.7	193	+ 12.2	2,062	+ 8.5	203	+ 12.8	116	+ 27.5
1974	7,912	+ 21.5	381	+ 97.4	2,470	+ 19.8	255	+ 25.6	151	+ 30.2
1975	9,943	+ 25.7	539	+ 41.5	2,989	+ 21.0	279	+ 9.4	248	+ 64.2
1976	11,815	+ 18.8	751	+ 39.3	3,539	+ 18.4	318	+ 14.0	356	+ 43.5
TQ*	3,154	---	256	---	1,051	---	87	---	107	---
1977	14,515	---	1,077	---	4,399	---	352	---	478	---
1978	16,821	+ 15.9	1,300	+ 20.7	5,202	+ 18.3	354	+ 0.6	556	+ 16.3
1979	19,308	+ 14.8	1,577	+ 21.3	6,152	+ 18.3	366	+ 3.4	649	+ 16.7
1980	23,296	+ 20.7	1,890	+ 19.8	7,449	+ 21.1	402	+ 9.8	782	+ 20.5
1981	27,926	+ 19.9	2,268	+ 20.0	8,967	+ 20.4	439	+ 9.2	977	+ 24.9
1982	32,843	+ 17.6	2,660	+ 17.3	10,818	+ 20.6	473	+ 7.7	1,293	+ 32.3
1983	37,129	+ 13.0	3,162	+ 18.9	13,056	+ 20.7	518	+ 9.5	1,683	+ 30.2
1984	40,313	+ 8.6	3,679	+ 16.4	14,732	+ 12.8	544	+ 5.0	2,021	+ 20.1
1985	42,533	+ 5.5	4,396	+ 19.5	16,053	+ 9.0	590	+ 8.5	2,346	+ 16.1

[a] Includes payments for routine maintenance dialysis treatments since FY 1974.
[b] Includes payments for durable medical equipment, ambulance, and several other non-physician services covered under Medicare Supplementary Medical Insurance.
[c] Includes payments under both Medicare Hospital Insurance and Supplementary Medical Insurance.

*Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Note: Payments on an incurred basis by type of provider are estimated and subject to change as more recent and complete data become available and estimates are revised.

Table 7.4b

DISTRIBUTION OF ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS
BY TYPE OF PROVIDER
FY 1967-85

Fiscal Year	Inpatient Hospital	Outpatient Hospital	Physician	Skilled Nursing	Home Health	Other
1967	68.14%	0.62%	26.17%	3.67%	0.85%	0.55%
1968	65.22	0.81	24.65	6.80	1.30	1.22
1969	65.21	1.24	23.12	6.46	1.46	2.52
1970	67.11	1.66	23.03	4.23	1.44	2.53
1971	69.43	1.93	22.38	2.80	1.10	2.36
1972	70.14	2.03	22.45	2.13	1.08	2.19
1973	70.14	2.08	22.21	2.19	1.25	2.14
1974	69.29	3.34	21.63	2.23	1.32	2.18
1975	69.48	3.77	20.89	1.95	1.73	2.18
1976	68.77	4.37	20.60	1.85	2.07	2.34
TQ	66.09	5.36	22.02	1.82	2.24	2.45
1977	68.09	5.05	20.64	1.65	2.24	2.32
1978	67.79	5.24	20.96	1.43	2.24	2.34
1979	67.18	5.49	21.41	1.27	2.26	2.39
1980	67.17	5.45	21.48	1.16	2.25	2.49
1981	67.06	5.45	21.53	1.05	2.35	2.56
1982	66.66	5.40	21.96	0.96	2.62	2.40
1983	65.38	5.57	22.99	0.91	2.96	2.18
1984	64.31	5.87	23.50	0.87	3.22	2.23
1985	62.72	6.48	23.67	0.87	3.46	2.80

Source: Health Care Financing Administration, Office of the Actuary.

Table 7.5 describes the real rate of growth[3] of inpatient hospital benefit payments. This table shows that, while much of the increase during the mid-1970's and early 1980's could be attributed to general inflation, real payments increased by 353 percent between FY 1967 and FY 1983. Real growth over the most recent two years—since prospective payment has been in effect--appears to have been slower than in previous years. In fact, the real increase in inpatient hospital payments during FY 1985 was the lowest in the history of the program.

In Table 7.6, average annual rates of increase are presented, both in nominal and in real terms, for the period immediately prior to implementation of the cost containment provisions of TEFRA (FYs 1977-82), the year that TEFRA provisions were in effect (FY 1983), and the PPS period (FYs 1984-85). As this table shows, the nominal rate of growth in Medicare hospital benefit payments appears to have decreased steadily from the pre-TEFRA period to the TEFRA year and from the TEFRA year to the PPS period. As stated above, much of the growth in nominal Medicare benefit payments during the pre-TEFRA period was due to general inflation; nonetheless, the real rate of growth in Medicare inpatient hospital benefit payments seems to be substantially lower during the PPS period than before.

Outpatient Hospital Services

With the implementation of PPS, it was feared that, since the new system would encourage hospitals to shift treatment from the inpatient setting, utilization of--and thus payments for--outpatient hospital services would increase. If this

[3] "Real" growth is calculated after all expenditure figures have been adjusted for the overall rate of inflation, as measured by the CPI compiled by the Bureau of Labor Statistics, U.S. Department of Labor. This figure may be contrasted with "nominal" growth which is not adjusted for inflation.

Table 7.5

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS
FOR INPATIENT HOSPITAL SERVICES
FY 1967-85

Fiscal Year	Incurred Payments (in $ millions)	Percent Change	Real Payments (in $ millions)	Percent Change
1967	2,729	---	2,768	---
1968	3,464	+ 26.9	3,399	+ 22.8
1969	4,200	+ 21.2	3,933	+ 15.7
1970	4,663	+ 11.0	4,123	+ 4.8
1971	5,355	+ 14.8	4,500	+ 9.1
1972	5,937	+ 10.9	4,815	+ 7.0
1973	6,513	+ 9.7	5,080	+ 5.5
1974	7,912	+ 21.5	5,664	+ 11.5
1975	9,943	+ 25.7	6,407	+ 13.1
1976	11,815	+ 18.8	7,109	+ 11.0
TQ	3,154	---	1,835	---
1977	14,515	---	8,123	---
1978	16,821	+ 15.9	8,793	+ 8.3
1979	19,308	+ 14.8	9,151	+ 4.1
1980	23,296	+ 20.7	9,719	+ 6.2
1981	27,926	+ 19.9	10,491	+ 7.9
1982	32,843	+ 17.6	11,484	+ 9.5
1983	37,129	+ 13.0	12,544	+ 9.2
1984	40,313	+ 8.6	13,084	+ 4.3
1985	42,533	+ 5.5	13,317	+ 1.8

*In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Table 7.6

AVERAGE ANNUAL RATES OF INCREASE
IN ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS
BY TYPE OF PROVIDER

Type of Provider	FY 1977-82 Nominal	FY 1977-82 Real*	FY 1982-83 Nominal	FY 1982-83 Real*	FY 1983-85 Nominal	FY 1983-85 Real*
Inpatient Hospital	+17.7%	+ 7.2%	+13.0%	+ 9.2%	+ 7.0%	+ 3.0%
Outpatient Hospital	+19.8	+ 9.1	+18.9	+14.9	+17.9	+13.5
Physician	+19.7	+ 9.0	+20.7	+16.6	+10.9	+ 6.7
Skilled Nursing	+ 6.1	- 3.4	+ 9.5	+ 5.8	+ 6.7	+ 2.7
Home Health	+22.0	+11.1	+30.2	+25.8	+18.1	+13.7

*In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Fedral fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

increase is large enough, it may counteract much of the cost saving effect of prospective payment.

The historical pattern of estimated incurred Medicare benefit payments for outpatient hospital services, as represented in Table 7.4a, shows that Medicare outpatient benefit payments grew from $25 million in FY 1967 to $3.2 billion in FY 1983, with the annual rate of increase falling below 15 percent only once (again, during the era of wage and price controls). In FY 1984, the increase in outpatient hospital benefit payments was 16.4 percent--which, while still substantial, was the smallest increase in 11 years. However, the estimated increase in FY 1985 was 19.5 percent--the largest in five years.

The steady increase in outpatient hospital payments is reflected in Table 7.4b by the growing share of these payments relative to total Medicare benefits. In FY 1967, outpatient hospital payments accounted for less than two-thirds of one percent of total Medicare benefit payments; by FY 1983, this share had increased to 5.6 percent. Under PPS, the share of outpatient hospital payments has continued to increase, to 6.5 percent--over 10 times what it was at the beginning of the Medicare program.

Table 7.6 describes the average annual nominal and real rates of increase for outpatient hospital benefit payments during the pre-TEFRA, TEFRA, and PPS periods. As this table shows, the nominal rates of growth for the three periods are comparable, but the real rate of growth of outpatient payments during the PPS period, with tighter inpatient cost controls, is higher than it was during the years immediately preceding the PPS. This may indicate some shifting of Medicare costs from hospital inpatient to hospital outpatient services, but more detailed analysis of this issue is necessary in order to reach a more definitive conclusion (see Chapter 6).

Physician Services

As Table 7.4a shows, estimated incurred Medicare benefit payments for physician services increased from $1.0 billion in FY 1967 to $13.1 billion in FY 1983 --an increase of 1146 percent. From FY 1974 to FY 1983, the increase in physician payments was never less than 18 percent. In FY 1984, physician payments increased by 12.8 percent--the lowest in 11 years--and in FY 1985, the increase was only 9.0 percent. The explanation of this decrease in the rate of growth of physician payments is complicated by the Medicare physician payment freeze, imposed on July 1, 1984 and effective for all of FY 1985. Other factors in this trend may include the declines in Medicare hospital admissions and length of stay under PPS.

Table 7.6 makes it clear that, whatever the cause, the increase in physician payments has substantially slowed under PPS. The average annual nominal increase in physician payments during the PPS period is half of what it was prior to PPS, and the real increase is also much lower than it had been. Again, these figures are probably dominated by the effect of the physician payment freeze, although the decline in hospital admissions may have also played a role.

Despite this slowing in the rate of growth of physician payments, the share of these payments relative to total Medicare benefit payments has risen under PPS as shown in Table 7.4b. Between FY 1967 and FY 1976, the share of physician payments had fallen from 26.2 percent to 20.6 percent; in FY 1977, this share began to increase, and by FY 1983, it was back up to 23.0 percent. Under PPS, it has risen to 23.4 percent, indicating that, even with the slower rate of growth under the fee freeze, physician payments are growing faster than overall Medicare benefit payments.

Skilled Nursing Services

Estimated incurred Medicare benefit payments for skilled nursing services, as shown in Table 7.4a, have followed the most irregular pattern of any of the major Medicare payment categories. The annual percentage change in skilled nursing payments has varied from a 145.6 percent increase in FY 1968 to a 29.3 percent decrease only two years later.[4] From the beginning of the Medicare program to FY 1983, skilled nursing payments increased from $147 million to $518 million (252 percent); however, as Table 7.4a also shows, the annual rate of increase in these payments has been the smallest of any of the major components of Medicare benefit payments in each year since FY 1975.

This fact is reflected in Table 7.4b: between FY 1968 and FY 1983, skilled nursing payments as a share of total Medicare benefit payments fell from 6.8 percent to 0.9 percent. Under PPS, this share has fallen still further--despite the expectation that the need of Medicare patients for these services might increase with the reduction in the average length of inpatient hospital stays.[5]

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[4] A large portion of this variation in the growth of Medicare skilled nursing payments is due to a misrepresentation early in the program's history of the purpose of the skilled nursing benefit. There was a tendency early in the program to view this benefit as a long-term nursing home benefit, rather than as an extension of inpatient hospital care; this resulted in a lack of uniformity across intermediaries in making skilled nursing coverage determinations. Action was taken to clarify this concept in Intermediary letter No. 371, issued in April 1969 by the Social Security Administration's Bureau of Health Insurance.

[5] This may be due to the fact that the copayment for skilled services covered by Medicare is tied to the rapidly increasing hospital deductible amount, and thus is also rising rapidly. Thus, while the utilization of Medicare covered services may be rising, the copayment could be rising faster and the resulting Medicare benefit payment is rising more slowly.

Table 7.6 also reflects the erratic pattern of growth in skilled nursing payments. From FY 1977 to FY 1982, skilled nursing payments increased by about six percent per year; this was about one-third of the rate at which the other major components were growing—and, in real terms, actually represented a 3.4 percent annual decrease. During the PPS period, skilled nursing payments have increased at a real rate of only 2.7 percent per year—slower even than the growth of inpatient hospital payments.

Home Health Services

Home health services is the fastest growing component of Medicare benefit payments. As shown in Table 7.4a, estimated incurred Medicare benefit payments for home health services grew from $34 million in FY 1967 to almost $1.7 billion in FY 1983—an increase of 4850 percent.[6] In that time, the annual change in home health payments has varied widely, from a 102.9 percent increase in FY 1968 to 15 percent decrease 3 years later. However, between FY 1973 and FY 1983, home health payments increased steadily and rapidly—in only two of those years was the annual increase less than 20 percent. In the past 2 years, home health payments have continued to grow, with increases of 20.1 percent in FY 1984 and 16.1 percent in FY 1985.

The growth in home health payments may be contrasted with that of skilled nursing payments. As shown in Table 7.4b, while home health payments in FY 1968

[6] One factor in the growth of Medicare home health payments was the Omnibus Reconciliation Act of 1980 (Public Law 96-499), which liberalized home health benefits under Medicare. This legislation provided for the coverage of an unlimited number of home health visits (as opposed to the previous limit of 100 visits during a benefit period) and eliminated the previous requirement of a three-day prior hospitalization in order for home health services to be covered by Medicare.

comprised only 1.3 percent of total Medicare benefit payments--less than one-fifth the amount that was spent on skilled nursing services--the two components of benefit payments were about equal only eight years later, and home health payments were four times as large as skilled nursing payments in FY 1985. The sum of the two payment categories, however, was about the same as it was in FY 1967, at the beginning of the Medicare program.

As shown in Table 7.6, the real growth rate of home health payments under the PPS seems to have continued at its pre-TEFRA level or somewhat higher. While home health payments grew at a rate about 50 percent higher in real terms than the growth rate for inpatient hospital services during the pre-TEFRA period and about 175 percent higher during the TEFRA year, it has grown at a rate about 350 percent higher during the PPS period.

Total Medicare Benefits

Total estimated incurred Medicare benefit payments increased from $4.0 billion in FY 1967 to $56.8 billion in FY 1983, as shown in Table 7.7. During that time period, the annual increase was never below 15 percent, except for FY 1970-73. The two Medicare programs--HI and SMI--increased at comparable rates during that period, with HI payments growing by 1257 percent while SMI payments grew by 1478 percent. Between FY 1974 and FY 1983, neither HI nor SMI payments increased by less than 13 percent in any year. In FY 1984, however, total benefit payments rose by only 10.4 percent--the smallest increase since FY 1973--and in FY 1985, the increase was only 8.2 percent--the second smallest increase in the history of the program. This was due primarily to the slowing growth of HI payments--the 6.2 percent increase in HI during FY 1985 was the smallest in the history of the Medicare program.

Table 7.7

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS
UNDER HOSPITAL INSURANCE (HI) AND SUPPLEMENTARY MEDICAL INSURANCE (SMI)
FY 1967-85
(in $ millions)

Fiscal Year	HI Payments Amount	HI Payments Percent Change	SMI Payments Amount	SMI Payments Percent Change	Total Payments Amount	Total Payments Percent Change
1967	2,897	---	1,108	---	4,005	---
1968	3,868	+ 33.5	1,443	+ 30.2	5,311	+ 32.6
1969	4,675	+ 20.9	1,766	+ 22.4	6,441	+ 21.3
1970	5,018	+ 7.3	1,930	+ 9.3	6,948	+ 7.9
1971	5,623	+ 12.1	2,090	+ 8.3	7,713	+ 11.0
1972	6,176	+ 9.8	2,289	+ 9.5	8,465	+ 9.7
1973	6,787	+ 9.9	2,499	+ 9.2	9,286	+ 9.7
1974	8,270	+ 21.9	3,148	+ 26.0	11,418	+ 23.0
1975	10,381	+ 25.5	3,929	+ 24.8	14,310	+ 25.3
1976	12,364	+ 19.1	4,817	+ 22.6	17,181	+ 20.1
TQ	3,307	---	1,465	---	4,772	---
1977	15,182	---	6,134	---	21,316	---
1978	17,559	+ 15.7	7,254	+ 18.3	24,813	+ 16.4
1979	20,141	+ 14.7	8,598	+ 18.5	28,739	+ 15.8
1980	24,275	+ 20.5	10,408	+ 21.1	34,683	+ 20.7
1981	29,175	+ 20.2	12,466	+ 19.8	41,641	+ 20.1
1982	34,594	+ 18.6	14,677	+ 17.7	49,271	+ 18.3
1983	39,308	+ 13.6	17,480	+ 19.1	56,788	+ 15.3
1984	42,853	+ 9.0	19,833	+ 13.5	62,686	+ 10.4
1985	45,454	+ 6.1	22,365	+ 12.8	67,819	+ 8.2

Source: Health Care Financing Administration, Office of the Actuary.

Table 7.8 describes the trends, in both nominal and real terms, of total benefit payments per Medicare beneficiary. As this table shows, benefit payments have grown faster than the number of Medicare beneficiaries in every year throughout the history of the program, with payments per beneficiary increasing from $209 in FY 1967 to $2,194 by FY 1985. In real terms, there have been several years with decreases in payments per beneficiary, but the overall trend has been upward—real payments per beneficiary are well over three times as high now as they were at the outset of the program.

Table 7.9 compares the pre-TEFRA, TEFRA, and PPS trends in nominal and real Medicare HI, SMI and total benefit payments, as well as payments per beneficiary. This table shows that, while the real growth rate in HI payments under PPS is only half of what it was in the pre-TEFRA period (FY 1977-82), SMI payments are growing at a real rate about equal to the pre-TEFRA rate. The result is that total benefit payments are growing at a real rate that is only two-thirds of the pre-TEFRA rate. Taking into account the growth in the number of beneficiaries, the PPS period has seen a dramatic slowing in the real rate of growth of benefit payments: HI payments per beneficiary increased at a rate of only 1.7 percent in real terms between FY 1983 and FY 1985 and total Medicare benefit payments per beneficiary have increased by only 3.4 percent annually during the PPS period. Thus, it appears that the overall trend under PPS is toward reduced rates of growth.

Table 7.8

TOTAL INCURRED MEDICARE BENEFIT PAYMENTS PER BENEFICIARY
FY 1967-84

Fiscal Year	Total Benefit Payments (in $ millions) Nominal	Real*	Medicare Beneficiaries (in thousands)	Payments per Beneficiary Nominal	Real*
1967	4,005	4,062	19,170	209	212
1968	5,311	5,212	19,464	273	268
1969	6,441	6,031	19,735	326	306
1970	6,948	6,143	20,214	344	304
1971	7,713	6,482	20,566	375	315
1972	8,465	6,865	20,945	404	328
1973	9,286	7,243	23,098	402	314
1974	11,418	8,173	23,746	481	344
1975	14,310	9,220	24,455	585	377
1976	17,181	10,338	25,262	680	409
1977	21,316	11,928	26,216	813	455
1978	24,813	12,971	26,936	921	482
1979	28,739	13,620	27,648	1,039	493
1980	34,683	14,469	28,303	1,225	511
1981	41,641	15,643	28,844	1,444	542
1982	49,271	17,228	29,352	1,679	583
1983	56,788	19,185	29,872	1,901	642
1984	62,686	20,346	30,331	2,067	671
1985	67,819	21,233	30,916	2,194	687

*In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Table 7.9

AVERAGE ANNUAL RATES OF INCREASE
IN MEDICARE HI, SMI, AND TOTAL BENEFIT PAYMENTS

Program	FY 1977-82 Nominal	FY 1977-82 Real*	FY 1982-83 Nominal	FY 1982-83 Real*	FY 1983-85 Nominal	FY 1983-85 Real*
HI Benefit Payments:						
o Total	+17.9%	+ 7.3%	+13.6%	+ 9.8%	+ 7.5%	+ 3.5%
o Per Beneficiary	+15.3	+ 5.0	+11.7	+ 8.2	+ 5.7	+ 1.7
SMI Benefit Payments:						
o Total	+19.1	+ 8.4	+19.1	+15.1	+13.1	+ 8.9
o Per Beneficiary	+16.4	+ 6.0	+16.8	+12.8	+11.2	+ 7.0
Total Benefit Payments:						
o Total	+18.2	+ 7.6	+15.3	+11.4	+ 9.3	+ 5.2
o Per Beneficiary	+15.6	+ 5.3	+13.2	+ 9.7	+ 7.4	+ 3.4

*In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Discussion

The first part of this chapter summarized several aspects of program operations that are related to the implementation of PPS. This material indicates that the new system is essentially in place, with some 80 percent of all Medicare hospitals participating. During FY 1986, hospitals in two additional States (Massachusetts and New York) will be included in the nationwide system. The PRO program has been implemented in an attempt to increase the intensity and effectiveness of medical review of the appropriateness and quality of care. Contracts have been signed to establish PROs in all 54 specified PRO areas and a large volume of cases have been reviewed by these organizations. Moreover, as the new system develops, the PROs' objectives will be tailored to meet special problems that may arise. In addition, HCFA has established a system for the review of PRO performance, including the creation of a SuperPRO, to make sure that the PROs are carrying out their crucial mandate.

The second part of this chapter reviewed the pattern of Medicare benefit payments since the implementation of the program in FY 1967, with a focus on the period prior to the cost containment provisions of TEFRA, the year that TEFRA was in effect, and the PPS period. It must be pointed out that the findings presented in this chapter cannot be attributed exclusively to PPS, for several reasons:

- As indicated in several notes and comments throughout this report, other changes relevant to Medicare reimbursement were occurring during the TEFRA and PPS periods.

- Although about 80 percent of all Medicare hospitals were participating in PPS during the first two years of PPS, changes affecting the other 20 percent may have had an effect on Medicare payments.

- Also, a significant amount of the Medicare payment to PPS hospitals still involves cost based reimbursement (for capital, direct medical education, and kidney acquisition costs) and thus is not under the control of prospective payment.

However, several tentative conclusions may be derived from the data presented in this chapter.

PPS appears to have slowed the rate of increase of Medicare inpatient hospital benefit payments. Although this increase is still above the general rate of inflation, it represents a downturn in the rapid growth of hospital payments that was seen as a major threat to the solvency of the Medicare Trust Fund.

Outpatient hospital benefit payments appear to be increasing at a rate greater than their pre-TEFRA growth rate. This may indicate that some of the savings from PPS are being spent on outpatient services. In contrast, physician benefit payments have increased at a rate far less than their pre-TEFRA rate. This is probably due, however, to the freeze in Medicare payment rates for physicians in 1984-85.

Skilled nursing benefit payments have comprised a steadily decreasing portion of overall Medicare benefit payments over the past 10 years. Payments for skilled nursing services have grown at a slower rate than any other major component of Medicare. However, the share of home health benefit payments has risen rapidly. Home health has consistently been the fastest growing component of Medicare

benefits over the past 10 to 12 years. How this relates to the anticipated increase in the demand for home health services under PPS is unclear at this time.

The overall level of Medicare benefit payments is increasing at a slower rate than it was before the implementation of prospective payment. This results from a sharp decline in the growth rate for HI payments, while the growth rate for SMI payments stayed at approximately its pre-TEFRA level. Medicare benefit payments per beneficiary have increased at a rate of only 3.4 percent per year during the PPS period—about 50 percent slower than before TEFRA.

Despite the reduced rate of growth of Medicare benefit payments, the program remains in financial jeopardy. The current projection by HCFA's OACT, in the 1987 Annual Reports of the Medicare Trustees (U.S. Department of Health and Human Services, 1987), is that the Hospital Insurance Trust Fund may become insolvent by the year 2002 - 05. This projection was made under "intermediate" assumptions about economic conditions and other factors related to Medicare revenues and disbursements.

REFERENCES FOR CHAPTER 7

U.S. Department of Health and Human Services. 1987 Annual Reports of the Medicare Board of Trustees. Washington, D.C.: 1987.

Appendix A

CALCULATION OF PROSPECTIVE PAYMENT RATES

The PPS rate for a given type of case at a given hospital is determined by a procedure consisting of the following components:

- The calculation of the adjusted standardized amount, which represents the average operating cost for a typical Medicare inpatient stay, independent of the individual hospital's case mix, area wages, and indirect teaching costs;

- The calculation of the regional and national payment rates, which represent average operating costs for cases in the hospital's own geographic region and nationwide, respectively; and

- The calculation of the hospital-specific payment rate, which represents the hospital's own historical level of costs.

The hospital-specific, regional, and national rates are then combined in the appropriate proportions.

The calculation of the adjusted standardized amount for FY 1985 was accomplished in six steps:

- First, the cost per Medicare case was computed for each hospital from data on the hospital's unaudited Medicare cost report for the cost reporting period ending during 1981.

- Next, these cost per case figures were updated to account for inflation through FY 1985, using actuarial estimates of the rate of increase in hospital operating costs nationwide between 1981 and FY 1983, the estimated annual rate of increase in the hospital market basket, plus one percentage points, from FY 1983 through FY 1984, and the estimated annual rate of increase in the hospital market basket, plus 0.25 percentage point, from FY 1984 through FY 1985.

- The updated cost per case figures by hospital were then standardized for inter-hospital variation in case mix and indirect medical education costs. This was done by first dividing by the hospital's 1981 case mix index and then dividing by an index of the hospital's additional indirect medical education costs.[1]

- The results of the previous calculation were then standardized for differences in area wage levels and, for hospitals in Alaska and Hawaii, for general differences in the cost of living. This was done by dividing the "labor-related portion" of the hospital's cost per case (defined as 79.15 percent of the total cost per case) by the appropriate area wage index, and by dividing the "non labor-related portion" of the hospital's cost per case (defined as 20.85 percent of the total cost per case) by an index of the cost of living for Alaska and Hawaii.

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[1]This index depends on the hospital's ratio of interns and residents per bed (R) and the indirect teaching adjustment factor (0.1159 in FY 1985), and is derived according to the following formula: $1 + (10 * R * 0.1159)$. See the discussion of the additional payment for indirect teaching costs below.

- The resulting standardized cost figures were grouped for urban and rural hospitals in each census region and nationwide.

- The standardized regional and national average cost figures were adjusted for four additional factors:
  - the omission from the 1981 data of costs that were previously billed under Part B but were to be considered as Part A costs under the PPS;
  - the additional cost incurred by hospitals that were required to pay FICA taxes beginning on January 1, 1984;
  - the requirement that a certain portion of anticipated PPS payments (five percent in FY 1985) be set aside for additional payments to hospitals for exceptionally long or costly cases (known as outliers[2]); and
  - the requirement that the services of non-physician anesthesists be reimbursed in full by Medicare on a reasonable cost basis.

  These adjustments were made by multiplying the standardized average cost figures by indexes reflecting the estimated magnitude of these factors (1.0013, 1.0018, 0.95, and 0.9968 (for the national rate) and 0.9958 (for the regional rate), respectively).

The resulting amounts were the basis for the calculation of the prospective payment rates.

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[2]For a more precise definition of outlier cases, see the discussion of the additional outlier payment in Chapter 2.

To obtain the regional and national payment rates for FY 1985, the appropriate regional and national adjusted standardized amounts were divided into their labor-related and non labor-related portions (79.15 and 20.85 percent, respectively, of the total amounts). The labor-related portion was then multiplied by the appropriate area wage index, and the non labor-related portion by the appropriate cost of living index for hospitals in Alaska and Hawaii. The labor-related and non labor-related portions were added back together, and multiplied by the appropriate budget neutrality factor (0.950 for the regional rate and 0.954 for the national rate). Finally, the resulting figures were multiplied by the appropriate DRG relative weight (which reflects the nationwide relative cost of treating cases in that DRG).

To obtain the hospital-specific payment rate for FY 1985 for each case treated at a given hospital, the hospital-specific amount for FY 1984 was updated to FY 1985, to obtain the FY 1984 rate, the following steps were required:

- First, the hospital's base year cost per Medicare case was computed, from data on audited Medicare cost reports for cost reporting periods ending between September 30, 1982 and September 29, 1983.
- Next, this base year cost per case figure was adjusted for the hospital's case mix by dividing by the hospital's 1981 case mix index.
- The case mix adjusted base year cost per case was then updated for inflation, based on the estimated annual rate of increase in the hospital market basket, plus one percentage point, through FY 1984.

- To adjust for the requirement that PPS payments be equal to projected TEFRA payments in FY 1984 and FY 1985, this figure was then multiplied by a budget neutrality factor (set equal to 0.987, according to HCFA's actuarial estimates).

Finally, the resulting figure was multiplied by the appropriate DRG relative weight.

The PPS payment rate could then obtained by blending the hospital-specific, regional, and national payment rates in the appropriate proportions. Using the example of the hospital with a cost reporting period beginning on January 1 (see Table 2.2 in Chapter 2), a case discharged on April 15, 1985 would have been paid at a rate equal to 50 percent of the hospital-specific rate plus 37.5 percent of the appropriate regional rate plus 12.5 percent of the national rate, with each rate calculated as described above.

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