

Chapter 3

Preliminary Evidence of the Impacts of PPS

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Preliminary Evidence of the Impacts of PPS

INTRODUCTION

A useful early step in the development of a strategy for evaluating a program is to identify what is and is not known about it. Medicare's prospective payment system (PPS) established by the Social Security Amendments of 1983 (Public Law 98-21) completed on October 1, 1985, the second year of its 3-year phase-in period. Some evidence of its impacts during the first year of its implementation is available but is tenuous at best.

As discussed in this chapter, some changes have occurred in the U.S. health care system that appear to be related to the adoption of PPS. In certain cases, strong evidence of changes that are coincident with the adoption of PPS suggest that at least part of the changes are due to the new payment system. Although in the absence of sophisticated analyses observed changes in behavior cannot be confidently ascribed to PPS, preliminary evidence of changes in the health care system can suggest whether the effects predicted by analyses of the financial incentives of PPS are occurring.

Because the evidence available from the first year of Medicare's PPS is so sparse, it is also useful to examine evidence from other prospective payment systems. The second part of this chapter reviews the evidence on the effects of three

kinds of hospital prospective payment systems to assess the extent to which providers actually do change behavior in ways consistent with new financial incentives:

- State ratesetting programs that do not use per-case prices based on diagnosis-related groups (DRGs);
- New Jersey's DRG-based prospective payment system; and
- Medicare's End-Stage Renal Disease program, which has essentially set prices for hemodialysis services since 1974.

The findings from studies of these programs might be better thought of as indicators than as evidence. The payment systems the studies analyze, even those that are nominally similar to PPS, differ enough from Medicare's PPS that few findings can be directly applied to the latter. What the findings from these studies can do is indicate, first, that certain impacts may apply to PPS; and second, the conditions under which the behavior of providers is likely to be sensitive to the financial incentives of PPS.¹

¹For a recent and more thorough summary of evidence from the Maryland and New Jersey payment systems, see F.J. Hellinger, "Recent Evidence on Case-Based Systems for Setting Hospital Rates," 1985 (131).

EVIDENCE FROM THE FIRST YEAR UNDER PPS

The Nature of the Evidence

The first year of Medicare's PPS, October 1983 to September 1984, had two features that are important in understanding the system's measured effects. First, since PPS took effect at the beginning of each hospital's fiscal year, hospitals entered the system gradually throughout the year. Although some hospitals entered the system on October 1, 1983, others did not do so until mid-1984. Second, the implementation of PPS was

only partial. Only 25 percent of each hospital's per-case payment amount during the first year was based on regional average costs of treating Medicare patients; the remainder was based on the hospital's own historical costs. The gradual implementation of PPS means that hospitals may not yet need to adjust fully to the new system's incentives. On the other hand, many hospitals may be changing behavior now in anticipation of the system's full implementation. PPS-related trends may even be exaggerated in some cases be-

cause hospital managers and staff are reacting to their expectations of the new payment system rather than to the system itself.

Evidence from the first year under PPS does not give direct information regarding the new system's impacts on expenditures and costs, quality of care, access to care, technological change, or clinical research. The evidence that is available can be broadly separated into four categories:

- evidence on the distribution of financial effects among hospitals;
- evidence on utilization of hospital services;
- evidence on hospital staffing, supplies, and equipment; and
- evidence on hospital management and organization.

Observed changes in overall Medicare hospital expenditures in the first year of PPS cannot be attributed to the new payment system. The reason is that these expenditures were capped in the first year of PPS's implementation by the budget neutrality provisions of the Social Security Amendments of 1983.²

The nature and quality of the available evidence on the new system's impacts varies widely. Some "evidence" on the distribution of financial effects among hospitals, for instance, is derived from studies that use pre-PPS Medicare data to simulate a PPS situation and compare it with cost-based reimbursement. Although these simulation studies do not reflect actual experiences under PPS, they do identify the patterns of redistribution of resources that would occur in the absence of any compensating responses by hospitals. Other evidence, particularly that on staffing and utilization, is based on actual experiences of hospitals under PPS, and levels and trends can be compared with those of the pre-PPS period. These data reflect real post-PPS experience and can provide relatively objective measures of hospital behavior, though changes in these measures cannot be confidently attributed to PPS.

²The PPS law (Public Law 98-21) specifies that payments for Medicare inpatient hospital services through fiscal year 1985 must be "budget neutral," i.e., no more (or less) than would have been paid under the Tax Equity and Fiscal Responsibility Act of 1982 (Public Law 97-248). The 1982 act placed payment limits and a rate of increase ceiling on Medicare cost-based reimbursement.

Finally, there is a great deal of subjective information on hospital behavior under PPS. Some information derives from surveys of or interviews with State health officials, hospital administrators, physicians, and other knowledgeable affected people. Market research surveys fall into this category, as do surveys and many studies by government and professional organizations (see ch. 10 for a compendium of surveys and studies of PPS). The validity of evidence relying on the perceptions of individual respondents is questionable. Nevertheless, anecdotal evidence is important in identifying individual changes or behaviors that may be due to PPS.

Distribution of Financial Effects Among Hospitals

Baseline Data From Simulation Studies

Simulation studies that compare Medicare revenues of hospitals under cost-based reimbursement with a hypothetical outcome if those hospitals had been under PPS (fully implemented) at the time provide baseline data on the distributional effects of PPS on hospitals' surpluses or profits. Table 3-1 summarizes the results of three such studies, all based on either 1980 or 1981 Medicare cost and billing data.

As shown in the table, all three studies predicted that small hospitals would fare well under PPS while large hospitals would fare relatively poorly. Teaching hospitals that qualified for large Medicare teaching allowances were generally expected to fare better than nonteaching hospitals. Government-owned hospitals were also predicted to do relatively well, possibly because many government-owned hospitals are also teaching hospitals. Urban hospitals and hospitals in the Northeast and South were predicted to fare better than rural hospitals and hospitals located in the North Central and West regions.³

These simulation studies are important because they predict PPS effects and suggest hypotheses that can be tested, but they do not themselves reflect real changes in hospital behavior or finan-

³The latter regions tend to have markedly lower average lengths of hospital stay than the former, but the implications of this for hospital performance are not entirely clear (265).

Table 3-1.—Predicted Distribution of Financial Effects of PPS on Hospitals

| | Study | | |
|------------------------------|-----------------|-----------------|--------------------------------|
| Hospital type | Vaida, 1984a | Vaida, 1984b | CBO, 1984 Wennberg, 1984 |
| Size: | | | |
| 0-49 beds | + | | + |
| 50-99 beds | + | | 0 ^f |
| 100-299 beds | | | |
| 300+ beds | | -d | 0 - e |
| Teaching status: | | | |
| Teaching: | | | |
| Minor ^g | | | |
| Major ^g | | + | + |
| Nonteaching | + | | |
| Ownership: | | | |
| Church | - | | - |
| Other nonprofit | + | | - |
| For-profit | | | |
| Government | + | | + |
| Location: | | | |
| Urban | + | | + |
| Rural | + | | |
| Northeast | + | | + |
| North Central | | | |
| South | + | | + |
| West | 0 | | |

KEY indicates that hospitals in that category are predicted to do well under PPS relative to cost based reimbursement
 - indicates that hospitals are predicted to do relatively poorly under PPS
 "0" indicates that hospitals are predicted to do about the same under either payment system

^aProjection of hospital bonuses and shortfalls

^bRegression analysis

^cMedium size hospitals 50 to 250 beds

^dA greater number of beds was correlated with poorer Performance

^eLarge hospitals (more than 250 beds)

^fTeaching hospitals with small intern and resident to bed ratios and thus relatively small Medicare teaching allowances

^gTeaching hospitals with large intern- and resident to bed ratios and thus relatively large Medicare teaching allowances

SOURCES: M. Vaida, "The Financial Impact of Prospective Payment on Hospitals," Washington, DC: *Health Affairs* 3(1): 112-119, Spring 1984; U.S. Congress, Congressional Budget Office, "Impact of Medicare's Prospective Payment System," memorandum Nov. 30, 1984; and J. E. Wennberg, "Small Area Variations in Hospitalized Case-Mix," final report, Department of Community and Family Medicine, Dartmouth Medical School, Hanover, NH, Oct. 31, 1984.

cial outcomes. In fact, changes in either hospital behavior (e.g., staff layoffs), hospital characteristics (e.g., case mix), or the structural aspects of PPS (e.g., the Medicare allowances to teaching hospitals) could invalidate their results. Also, these studies are one-dimensional. For example, small hospitals are predicted to do well, but rural hospitals are expected to fare poorly. Even if most rural hospitals are small, it is possible for these results to hold as long as a few large rural hospitals suffer very heavy losses or as long as enough small urban hospitals do very well.

Baseline predictions of differences in financial status among hospitals are available from other sources besides these studies. For example, one study of hospitals in five large metropolitan areas, based largely on 1981 Medicare billing and cost report data, found that inner-city hospitals had higher average costs per patient than did suburban hospitals, implying that the former may be "losers" relative to the latter under PPS (82).

Evidence Since the Introduction of PPS

The only strong evidence of actual hospital financial status since PPS is from the American Hospital Association's (AHA) "National Hospital Panel Survey Report," which found that hospitals as a group saw a larger financial gain in 1984 (an \$8.3 billion surplus) than in any year since 1963, when the survey began (21). Geographically, hospitals in the West South Central and Mountain regions of the United States experienced a financial decline (146). Small hospitals' operating margins⁴ also dropped, and the smallest hospitals (those with fewer than 25 beds) suffered absolute losses (21). This evidence suggests that large hospitals were able to cut costs rapidly, while small hospitals were not. Nonetheless, hospitals as a group did well under the first year of PPS and have continued to do so into 1985 (177). The caution to this conclusion is that further cost reductions may prove to be much harder, even as PPS becomes fully implemented.

Several observers have predicted that PPS may pose financial hazards to rural hospitals (284, 384), and the American Medical Association's DRG Monitoring Project suggests that this may actually be so (18). There is no published, objective evidence on how rural hospitals have fared, although given that many of them are small they probably have not prospered.

Utilization of Hospital Services

Average Length of Hospital Stay

The most pronounced change in hospital utilization among Medicare patients in the early 1980s is a decrease in the average length of hospital stay

⁴A hospital's margin is the percent of its revenue retained after expenses (i.e., revenue minus expenses divided by revenue) (21).

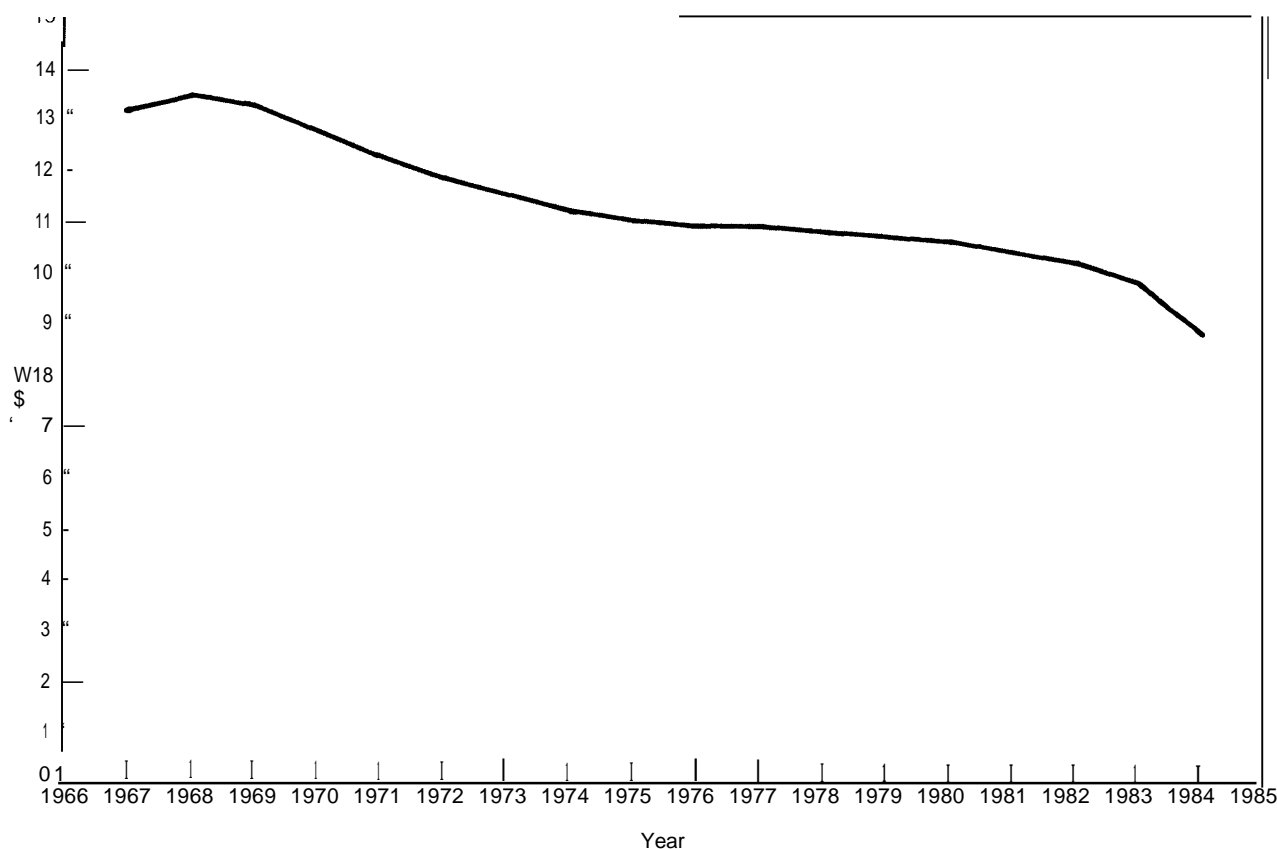
(ALOS). PPS seems to have contributed to this trend. The ALOS of the Medicare population in short-stay hospitals⁵ decreased before the implementation of Medicare's PPS from 13.4 days in 1968 to 10.2 days in 1982, an annual rate of decrease of 1.9 percent. By the end of 1984, it had dropped to 8.8 days (see fig. 3-1), for an average annual rate of decrease of 7.1 percent between 1968 and 1984. The difference between PPS and non-PPS Medicare stays is even more striking. Between October 1983 and September 1984, the first year of PPS phase-in, Medicare ALOS in all short-stay hospitals (including those under PPS) was 8.9 days, but the ALOS of Medicare patients in hospitals under PPS alone was 7.5 days (332).

⁵“A short-stay hospital is one in which the average length of stay is less than 30 days. General and special hospitals are included in this category” (326).

PPS is not the only factor that has contributed to shorter lengths of stay in acute-care hospitals. Hospital ALOS has been decreasing in both the Medicare and non-Medicare populations for some time. Between 1974 and 1983, the ALOS in the under-65 population dropped from 6.6 to 5.8 days; the ALOS in the over-65 population dropped from 11.9 to 9.8 days (see fig. 3-2).⁶ However, this trend was almost certainly accelerated by the

⁶The under-65 population differs slightly from the Medicare population, since Medicare covers many disabled individuals under 65 and does not cover all persons over 65. Since the Health Care Financing Administration does not collect national utilization data on the non-Medicare population, however, age-based data are the only easily available means of providing a rough comparison between Medicare and non-Medicare admissions and lengths of stay. Age-based utilization data are available from several sources, including the American Hospital Association and the Commission on Professional and Hospital Activities (see app. C). The data used here were compiled by the National Center for Health Statistics.

Figure 3.1.—Average Length of Hospital Stay for Medicare Patients, 1967-84



NOTE: Data for 1967-77 based on hospital discharges; 1978-79 on admissions; 1980-84 on APM.

SOURCE: G. Lintzeris, Bureau of Data Management and Strategy, Health Care Financing Administration, U.S. Department of Health and Human Services, Baltimore, MD; personal communications, Dec 4, 1984 and Jan 11, 1985.

Figure 3-2.—Average Length of Hospital Stay: U.S. Short Stay Hospitals, 1974-83

SOURCE: E. M. C. Cart h, National Center for Health Statistics, Public Health Service, U.S. Department of Health and Human Services, Hyattsville, MD, personal communication, Mar. 28, 1985.

introduction of PPS. ALOS seems to be stabilizing somewhat in 1985 (148).

Interpretation of the impact of PPS on ALOS is complicated by factors other than the underlying trend. Reported ALOS is influenced by two separate PPS incentives, each with different policy implications. First, if hospitals are able to attract patients with less serious conditions, ALOS will decline. (Conversely, ALOS could rise in some DRGs if all but the most severely ill are treated as outpatients.) Second, reported ALOS will decline if patients are discharged earlier to other settings. During the first year of PPS, 13.7 percent of Medicare patients discharged from hospitals were discharged to some form of continuing care besides self-care (see table 3-2).⁷ No com-

⁷There is reason to believe that some data on hospital discharge status may be unreliable. The General Accounting Office is currently investigating inconsistencies between hospital and utilization and quality peer review organization (PRO) data on discharges to home health services (34).

Table 3-2.—Distribution of PPS Bills by Discharge Status, October 1983 to September 1984

| Discharge destination- ¹ | Percent |
|---|-----------------|
| Home (self-care) | 80.8 % |
| Short-term hospital | 1.7 |
| Skilled nursing facility | 5.4 |
| Intermediate care facility | 2.7 |
| Other facility | 0.9 |
| Home health service | 3.0 |
| Discharged against medical advice | 0.2 |
| Died | 5.3 |
| Total | 100.00/0 |

SOURCE: U.S. Department of Health and Human Services, Health Care Financing Administration, Background Paper, Baltimore, MD, December 1984.

parable data are readily available from a pre-PPS period, though it is probably possible to derive baseline data from the Commission on Professional and Hospital Activities' files (see app. C).

Results from a General Accounting Office study (297) and a congressional survey (303) support the hypothesis that Medicare patients are being dis-

charged from the hospital in a poorer state of health than before PPS and that the demand for posthospital skilled nursing care has increased as a result. Interpretation of these results must proceed cautiously, since they were based on small surveys of professional opinions; they may reflect the anticipation as well as the actual realization of earlier patient discharges. However, they are supported by indications that outpatient and home occupational therapy seem to have increased under PPS (122). They are also supported by widespread anecdotal evidence of early hospital discharges (134,150) and reports of inappropriate discharges identified by utilization and quality control peer review organizations (PROS) (288).

What these apparent discharge patterns mean for the ultimate outcomes of health care is not clear. If patients can receive adequate care outside a hospital, then earlier discharge (even if patients are in a sicker condition) may be acceptable or even beneficial. If these patterns of hospital behavior are accompanied by poorer outcomes of care, on the other hand, they have serious implications for Medicare policy.

Hospital Admissions

Contrary to expectations, Medicare hospital admissions during the first year of PPS actually declined. In the States participating in Medicare's PPS,⁸ Medicare admissions to short-stay hospitals were more than 4 percent lower in fiscal year 1984 (the first year of PPS) than in fiscal year 1983. By contrast, admissions had risen over 2 percent in the previous year (338). Figure 3-3 shows the hospital admission trends in the United States for Medicare patients from 1967 to 1984.

Aggregate admissions are not the only area of change; admissions in specific DRGs also suggest that hospitals may be changing their behavior in response to PPS. Table 3-3 lists the DRGs describing the 25 most frequent causes of hospital admission in fiscal year 1985 and indicates their relative ranking in fiscal year 1984 and calendar year 1981 for the purpose of comparison. Changes in DRG rankings, which are based on the relative

number of admissions in each DRG, do not always show the anticipated effects. As noted in chapter 2, for instance, the DRG for angina pectoris ranked higher as a proportion of total admissions in 1985 than in 1981 and the DRG for atherosclerosis ranked lower, yet a cursory analysis of the financial incentives predicts the opposite situation (152) (see table 2-1 in ch. 2). The extent to which these changes in frequency of admission are due to changes in technology and medical practice, hospital admission practices, coding practices,⁹ or simply changes in disease patterns is unknown.

The fact that admissions declined in the first year of PPS, rather than rising as predicted, suggests three hypotheses: 1) that there maybe strong counteractive forces; 2) that strategies aimed at increasing admissions take time to be developed; or 3) that admissions are difficult for hospital managers to influence directly. It may be easier, at least initially, for hospitals to increase outpatient visits (reimbursed on a cost basis) than to increase inpatient admissions in profitable DRGs. Strategies to admit patients twice (e.g., once for diagnosis and once for treatment) may also take time to develop. No data on hospital readmission under PPS have yet been analyzed, but the decline in overall admissions implies that the readmission rate has probably not increased significantly. Data on readmission before PPS indicate that under cost-based reimbursement, approximately 22 percent of Medicare patients discharged from the hospital were readmitted within 60 days (24).

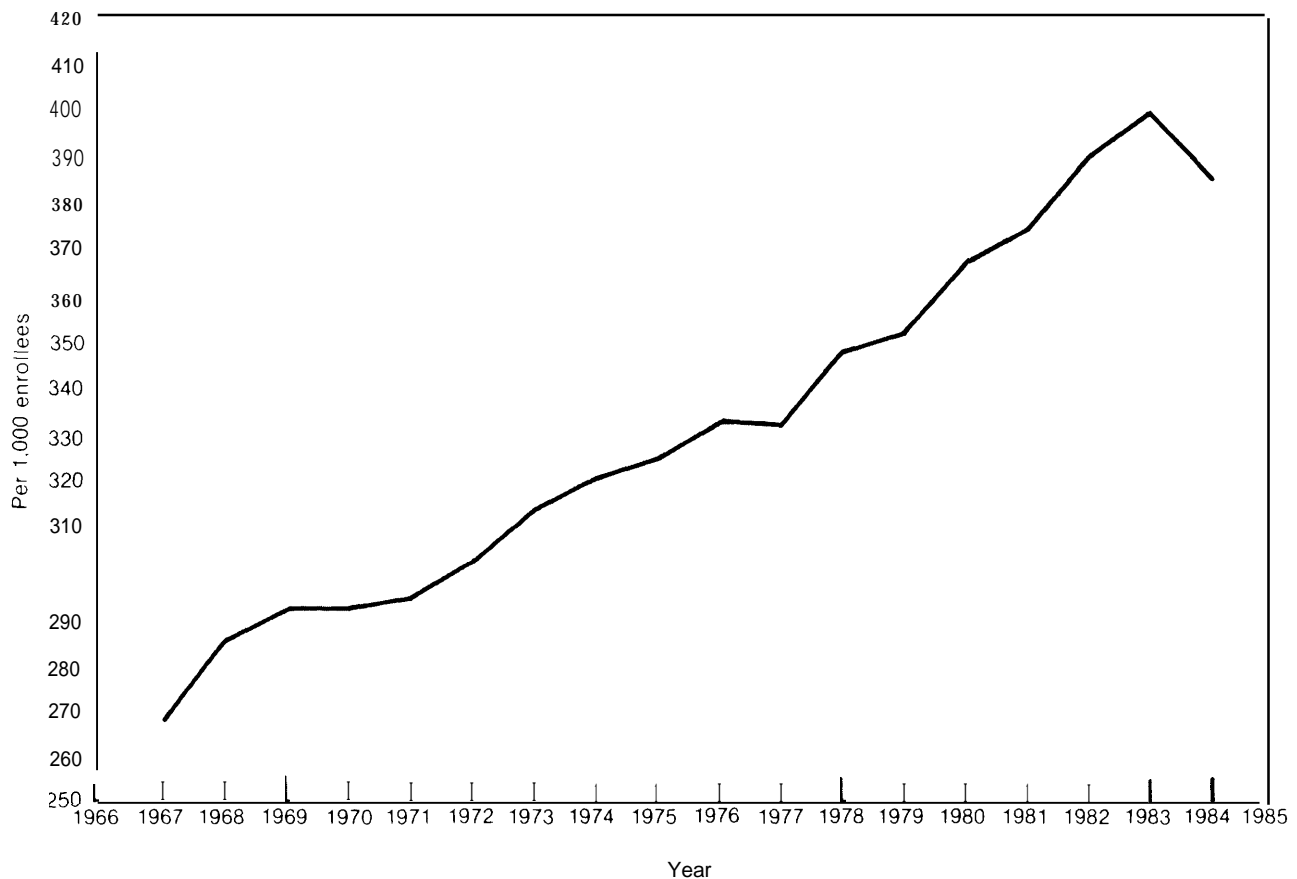
Hospital Staffing, Supplies, and Equipment

A decrease in hospital occupancy frequently corresponds with a decrease in staffing, and there is clear evidence that hospitals have been reduc-

⁸Nonparticipating, or "waivereci," States are Maryland, Massachusetts, New Jersey, and New York.

⁹Changes in the way hospitals code diseases and procedures can result in the appearance of patients being admitted with more serious illnesses than before PPS, even if there is no real change in case mix. This has apparently taken place (55). It is unknown how much of the coding change is due to hospitals' efforts to maximize reimbursement, since more accurate coding would increase the admissions in higher paying DRGs in any case. Analysis of Medicare data from two States revealed that, while incomplete or inaccurate surgical coding frequently led to classification into a lower paying medical DRG, the reverse virtually never occurred (392).

Figure 3-3.— Medicare Hospital Admissions, 1967-84



NOTES 1967-81 are calendar years 1982-84 are fiscal years 1967-77 are discharges not admissions (1967-81 aged only 1982-84 Includes disabled)
 SOURCE G. Lintzeris Bureau of Data Management and Strategy Health Care Financing Administration U.S. Department of Health and Human Services Baltimore
 MD personal communications Dec 4, 1984 and Jan 11 1985

ing their staffs during the past 2 years. AHA survey data indicate that the level of full-time equivalent (FTE) employees in U.S. community hospitals declined by 2.2 percent between May 1983 and May 1984, primarily because of a decrease in full-time employees (379). The number of part-time workers decreased by only **0.2 percent during the same period. The American Nursing Association reports that there has also been a shift away from licensed practical nurses towards the more highly trained registered nurses (20).**

Data from specific States and regions reinforce this picture of hospital cost containment through staff reductions. In Wisconsin, for example, total hospital employment dropped 4.9 percent be-

tween 1982 and 1984 (398). Major staff layoffs have also been reported in Pennsylvania, California, Florida, Ohio, Michigan, and Washington D.C. (25,109,246,251,379). It is important to note that since strategies for staff reduction include hiring freezes and attrition, the extent of staff reduction activities is probably much higher than the layoff figures alone indicate. On the other hand, the trend toward staff reductions began before many hospitals came under PPS. Thus, although PPS has probably encouraged the trend, it is by no means the only cause.

A reduction in staffing does not necessarily mean less staff time per hospitalized patient. Because of the recent trends towards fewer admis-

Table 3.3.—DRGs Representing the Most Frequent Causes of Hospital Admission in Fiscal Year 1985,^a Fiscal Year 1984, and Calendar Year 1981

| DRG No. | Description | Fiscal year 1985 rank ^a | Fiscal year 1984 rank | Calendar year 1981 rank |
|---------|---|------------------------------------|-----------------------|-------------------------|
| 127 | Heart failure and shock | 1 | 1 | 1 |
| 089 | Simple pneumonia and pleurisy | 2 | 6 | 7 |
| 140 | Angina pectoris | 3 | 5 | 11 |
| 182 | Esophagitis, gastroenteritis, miscellaneous digestive disorders | 4 | 2 | 2 |
| 014 | Specific cerebrovascular disorders | 5 | 4 | 6 |
| 096 | Bronchitis and asthma | 6 | 12 | 16 |
| 138 | Cardiac arrhythmia and conduction disorders | 7 | 8 | 13 |
| 296 | Nutritional and miscellaneous metabolic disorders | 8 | 10 | 21 |
| 039 | Lens procedures | 9 | 3 | 4 |
| 088 | Chronic obstructive pulmonary disease | 10 | 9 | 5 |
| 243 | Medical back problems | 11 | 7 | 12 |
| 015 | Transient ischemic attacks | 12 | 11 | 15 |
| 209 | Major joint procedures | 13 | 14 | 26 |
| 336 | Transurethral prostatectomy | 14 | 13 | 25 |
| 174 | Gastrointestinal hemorrhage | 15 | 15 | 23 |
| 122 | Circulatory disorders with acute myocardial infarction | 16 | 16 | 9 |
| 320 | Kidney and urinary tract infections | 17 | 17 | 19 |
| 210 | Hip and femur procedures | 18 | 20 | 32 |
| 121 | Circulatory disorders with acute myocardial infarction and cardiovascular complications | 19 | 22 | NA ^b |
| 087 | Pulmonary edema and respiratory failure | 20 | 24 | 45 |
| 294 | Diabetes | 21 | 18 | 10 |
| 468 | Unrelated operating room procedure | 22 | 19 | 8 |
| 148 | Major small and large bowel procedures | 23 | 23 | 38 |
| 082 | Respiratory neoplasms | 24 | 21 | 18 |
| 141 | Syncope and collapse | 25 | 30 | 47 |

^aBJIS received through July 1985^bcalendar year 1981 rank not available because previously combined with DRG *122

SOURCE: D. Wood, Bureau of Data Management and Strategy, Health Care Financing Administration, U.S. Department of Health and Human Services, Baltimore, MD; personal communication August 1985.

sions and shorter lengths of stay, the number of FTE employees per 100 patients actually increased between May 1983 and May 1984 (379).

There is no objectively measured evidence of PPS impacts on nonstaffing inputs, i.e., supplies and equipment. The general environment is one of cost competition; hospital suppliers are engaging in price wars and diversifying into other markets, while hospitals are forming group purchasing organizations to increase their buying power (14). The extent to which PPS is influencing this competitive environment, however, is unknown.

Cost competition also appears to be affecting the medical equipment market. Anecdotal evidence suggests that manufacturers are pursuing strategies such as developing equipment that is less labor-intensive (260). An analysis of the diagnostic imaging market suggested that government efforts to contain cost, including PPS, are slowing sales (48). Manufacturers are responding to a con-

striction of the market by increasing research and development efforts that will make current equipment obsolete through small incremental improvements; focusing efforts on the few areas of the market that promise to expand; and attempting to reduce the costs of producing those systems that are technologically stable (48).

Hospital Management and Organization

Medicare's PPS appears to be having an unambiguous impact on hospital information systems and their use in management. The use of DRGs as the basis for payment has led to a proliferation of computer packages aimed at helping hospitals estimate their actual costs per case and predict the reimbursement levels per patient (51,106).

The medical records departments of hospitals have also assumed great importance under PPS, since accurate records processing is necessary for

prompt maximum reimbursement (154). One result of this incentive has been an increase in automated medical records processing; one market research survey showed that use of automated processing among sampled hospitals jumped from 28.3 percent in 1981 to 48.1 percent in 1984 (222). Once again, this recent rapid trend toward automation is probably not entirely due to PPS, because increases in computerized information applications have taken place in many industries. Nevertheless, the information requirements and incentives of PPS have certainly been a contributing factor.

Lower hospital occupancy and incentives to increase admissions may be contributing to trends in the hospital industry toward increasing competition for patients, through strategies such as increases in hospital advertising (8,112,290). In the American Medical Association's DRG Monitoring Project, a compilation of physicians' comments on PPS, 73 percent of respondents stated that hospital admission and discharge policies had changed since the introduction of PPS (18).

Along with new discharge policies and the incentive to shorten ALOS comes an incentive un-

der PPS for hospitals to benefit from extending their services to other settings. The evidence suggests that hospitals are doing this, though again the trend began before the inception of PPS. The number of hospitals offering posthospital services (home health care, skilled nursing care, or other long-term care) increased between 1982 and 1983 and has increased even more since; 17 percent more hospitals were offering home health care services in 1984 than in 1983 (382). The number of Medicare-certified hospital-based home health agencies increased by more than 50 percent during 1984 (see table 3-4). Furthermore, three-quarters of hospital administrators responding to one recent survey said they planned to add or expand their home health services, outpatient surgery services, or both (204).¹⁰

¹⁰PPS may be affecting the organization of health care through more than incentives for hospitals to expand to new services. Some have postulated that the present health care environment, of which PPS is a part, encourages for-profit hospital chains that can cut costs through mechanisms such as bulk discounts (94). There is certainly abundant evidence of the activities of such enterprises, and in specific cases there seem to be links to PPS (285). However, there have been no general surveys or studies of PPS-specific effects in this area.

Table 3-4.—Medicare-Certified Home Health Agencies by Type of Agency

| Type of agency | December 1979 | September 1981 | December 1982 | December 1983 | December 1984 |
|--|------------------|-------------------|------------------|------------------|------------------|
| Visiting nurses association | 511 | 513 | 517 | 520 | 525 |
| Combination (government/voluntary) | 50 | 55 | 59 | 58 | 59 |
| Government | 1,274 | 1,23 | 1,211 | 1,230 | 1,226 |
| Rehabilitation center based | NA ^a | 11 | 16 | 19 | 22 |
| Hospital based | 349 | 432 | 507 | 579 | 894 |
| Skilled nursing home based | NA | 10 | 32 | 136 | 175 |
| Proprietary | 165 | 287 | 628 | 997 | 1,569 |
| Private nonprofit | 443 | 547 | 632 | 674 | 756 |
| Other | 66 | 38 | 37 | 45 | 21 |
| Total | 2,858 | 3,127 | 3,639 | 4,258 | 5,247 |

^aNA Not available home agencies in these categories were classified as 'other' in 1979.

SOURCE: D. Milstead, Health Care Financing Administration, U.S. Department of Health and Human Services, Baltimore, MD, March 1985.

EVIDENCE OF THE EFFECTS OF OTHER PROSPECTIVE PAYMENT PROGRAMS

State Ratesetting Programs

Over the past decade, a number of States have instituted some form of prospective payment as a means of controlling hospital costs. All of these State programs are characterized by payment rates that are set before services are actually rendered and that need not be a mere reflection of the costs actually incurred in serving patients (88). **In other respects, the programs differ greatly. The most important differences are whether hospital participation is mandatory or voluntary; whether compliance is mandatory or voluntary; whether all payers are covered or only a few; how rates are set; and the basis of payment.** Payment rates may be set, for instance, through the application of a formula or through review of a hospital's budget, which, once approved, is translated into rates sufficient to generate enough revenue to cover it (89). The unit of payment may be per stay, per day, per specific service, or based on the allocation of the approved hospital budget among third-party payers according to their anticipated share (89).

The State programs whose experience is most relevant to PPS are those in which hospital participation and compliance are mandated by law. These include programs in the four States currently holding Medicare waivers from PPS (New Jersey, Massachusetts, New York, " and Maryland) and in a few States without waivers (notably Washington, Connecticut, and western Pennsylvania). Two of these States—New Jersey and Maryland—have had some experience with both per-case payment and a case-mix classification method similar to Medicare's DRG system. However, only New Jersey has required that all hospitals use the same classification system; Maryland has allowed hospitals to choose from a number of systems.

The one finding common to nearly all studies of State prospective payment programs is that programs with mandatory participation and compliance have controlled rates of increase in hos-

pital costs. States with such mandatory programs have succeeded in keeping their increases in hospital costs and expenditures below increases of other States. The findings with regard to whether State programs with voluntary participation have controlled costs are inconclusive (35,60,268,269),

The finding that mandatory State ratesetting programs have helped control increases in hospital costs must be interpreted carefully. First, with the exception of Washington, the States with strict prospective payment programs had much higher costs than the national average; only the **increases** in cost were lower than States without such programs (385). Rather than being the cause of all observed differences, State ratesetting programs may have been implemented because of preexisting differences between State health care systems. Second, in most cases, these effects on cost became apparent only after the programs had been in place for a few years (35,269). Third, the comparability between State ratesetting programs and Medicare's PPS is debatable. Experience with the State program that is perhaps the most comparable to PPS, New Jersey's DRG-based program, is discussed further below.

Cost containment may come at the expense of efficiently run hospitals as well as inefficient ones. One study found that hospitals with particularly high expenditures before ratesetting were likely to remain high (22). It was not clear whether this occurred because hospitals with high expenditures convinced regulators that in fact they were efficient, because the State did not find it cost-effective to pursue them, or because the hospitals could not reduce the inefficiencies despite financial pressure.

Worthington and Piro, analyzing the effects of State ratesetting programs from 1969 to 1978 on hospital utilization, found that occupancy levels were generally higher (and increased faster) in ratesetting States than in other States (401). **States that regulated per diem rates had the most predictable outcomes; as hypothesized, length of stay was significantly increased in all three such States.**

¹¹ New York's waiver expires at the end of 1985.

A more surprising finding was that in three States in which rate regulation decreased the cost per admission it nevertheless increased the ALOS. One explanation for this finding is that in the early years of rate regulation, hospitals tended to control costs by reducing service intensity rather than by reducing ALOS even where they were not paid per diem (401). For example, much of the cost savings per admission in the New Jersey program has been achieved through inpatient ancillary service savings, with possible coincidental cost-shifting to nonregulated outpatients (250).

Prospective payment programs do seem to affect health care employment. States under prospective payment tend to reduce the number of FTE employees per inpatient day (166). In New York, Maryland, and Massachusetts, prospective payment lowered the demand for licensed practical nurses and, to a lesser degree, for registered nurses as well (113). Average net physician incomes have also grown more slowly in States with strict hospital regulatory programs than in those without (406).

There is evidence of State prospective payment effects on the diffusion of medical technologies, but the evidence is often inconsistent. The observed changes may be due to specific characteristics of the individual States rather than to the existence of ratesetting programs. One analysis found that State ratesetting programs generally discouraged computed tomography scanning in hospitals, leading in a shift in the location of scanners from hospitals to physicians' offices (157). But other analyses have found very State-specific effects on technology adoption and use. One study found that New York's program appeared to depress the availability of all types of services; New Jersey's tended to reduce the availability of most complex services; and other States' programs showed no consistent impact on service adoption at all (70). Another study of the impact of prospective payment on capital equipment adoption in five States found that New York hospitals tended to adopt more cost-saving and less cost-raising equipment, but programs in Maryland and Indiana showed no such consistent effects on hospitals' adoption behavior (249). A third study found that ratesetting had no effect on the diffusion of most surgical technologies but did slow

the adoption of the expensive coronary bypass procedure (270). However, about half of the ratesetting hospitals analyzed for this study were in New York, and the conclusion may be simply that New York has characteristics that sometimes slow technological diffusion.

New Jersey's DRG-Based Hospital Payment System

New Jersey is the only State to have implemented a prospective hospital payment system, uniform across all hospitals and all payers, in which the unit of payment is per-case and patients are classified according to DRG. New Jersey's program was first implemented in a small number of hospitals in 1978 and then was expanded to the entire State in 1980. The design of the program differs in several important details from Medicare's PPS. Nevertheless, New Jersey's hospital payment system is closer to Medicare's PPS than any other State system, and because of that, it has received quite a bit of attention.

An evaluation of New Jersey's DRG-based hospital payment system was completed by the Health Research and Education Trust of New Jersey in 1982. The study's findings regarding the organizational impact of the DRG-based system were as follows (130):

- Hospitals under New Jersey's DRG-based payment system expanded the type and quantity of management information gathered. Clinical data improved in accuracy but also took more time to produce.
- Decisionmaking was more decentralized in hospitals under the DRG-based payment system than in non-DRG hospitals.
- The importance of medical records departments increased dramatically in hospitals using DRGs.
- The medical staffs in hospitals using DRGs became much more involved in managerial decisions than they had been before the DRG-based payment system was implemented.
- Hospitals under DRG-based payment tended to be more output-oriented than non-DRG hospitals.

The Health Research and Educational Trust also found a number of financial and economic impacts of DRGs that have implications for PPS:

- The direct costs of implementing DRG-based payment was high because of the need to improve hospital data collection and billing (131).
- In the initial year of DRG implementation, hospitals under DRG-based payment actually received more revenue than they would have under the previous ratesetting scheme. Most hospitals benefited financially from the case-mix classification system (131).
- The evaluators estimated that it would be several years, if ever, before the overall cost containment objective could be attained (192).

Finally, the 1982 evaluation of New Jersey's system noted that the ALOS seemed to be affected very little by the use of DRGs; it dropped only 0.03 percent between 1979 and 1980 (131).

Some of the effects of New Jersey's hospital payment system are likely to be artifacts of its specific design. Each DRG price is computed as a blend of the hospital's own costs and the average cost of treating patients in specific hospitals (123). Hospitals are cushioned by this system from incurring severe losses in any DRG. Also, New Jersey's program apportions payment for uncompensated care among the payers. This approach reduces financial problems for hospitals at high risk for bad debts.

Thus, the lessons from New Jersey for Medicare's PPS are limited. They do suggest, however, that hospitals will respond to per-case payment in ways that are predicted by theory.

Medicare's End-Stage Renal Disease Program

Since 1973, Medicare has covered approximately 93 percent of the people in the United States suffering from end-stage renal disease (46). From July 1973 until August 1983, Medicare reimbursed for hemodialysis¹² services and supplies

¹²Hemodialysis is a process that substitutes for normal kidney function. Blood is pumped from the patient's body into a dialyzer, cleansed of waste products, and returned to the body.

to these patients at a rate of 80 percent of the average cost to a hospital-based dialysis facility (up to a specified limit); 80 percent of reasonable charges for a freestanding facility (also up to a limit); and 80 percent of allowed costs for supplies and equipment for home dialysis (100 percent after 1978) (248). By 1982, nearly all freestanding facilities were being paid at the limit of \$138 per treatment. "Most hospital-based facilities, on the other hand, had been granted exceptions to the specified payment limit, and the average payment to hospitals by 1980 was about \$159 per treatment. Since 1974, then providers of dialysis services have faced prospectively set rate limits. Hospital-based providers had few incentives to keep costs below the payment rates because they could not retain surpluses. Freestanding facilities, in contrast, were able to keep any profits. Under these conditions, providers of dialysis services and supplies proliferated, and costs multiplied, though most of the increase in costs was due to an increase in the eligible population (96,115,245).

The End Stage Renal Disease Amendments of 1978 (Public Law 95-292) established a new prospective payment method for dialysis facilities. Under this new program, effective August 1, 1983, hospital facilities are paid an average of \$131 per dialysis session, and freestanding facilities are paid an average of \$127, regardless of whether dialysis occurs in the center or at home (48 FR 21254). Hospitals may keep payment surpluses but must absorb losses when costs exceed price.

The prospective payment method does seem to have stimulated some cost competition in the supply market. Since its implementation, there has been little increase in the price of dialysis, supplies. Prices for at least one key product, dialyzers, have actually fallen (248). Reuse of dialyzers, one way of lowering costs, ¹⁴ has increased rapidly in re-

¹³Payment for dialysis from 1974 until mid-1983 was limited to a maximum of \$133 per treatment. "If routine laboratory services were included in the facility's costs, the screen [limit] was raised by \$5; if the supervisory services of a physician were included in the facility's costs, the screen was increased by \$12 more to \$150" (248).

¹⁴The extent to which this apparent cost savings comes at the expense of safety has not been resolved, although reuse seems to be safe most of the time if the dialyzer is properly reprocessed and not overused (248).

cent years, suggesting that this trend is encouraged (though not necessarily caused) by prospective payment. It is expected that the prospective pay-

ment program will also continue the trend to home dialysis and encourage the proliferation of dialyzing devices used in that setting (248).

CONCLUSIONS

An overview of the evidence on the impacts of Medicare's PPS during its first year of implementation indicates the breadth and depth of evaluation necessary, helps identify evaluation resource needs, and supports the formulation of critical questions.

The evidence presented here is sparse and demonstrates how little we know at present about the ultimate effects of PPS on the health care system. Its weakness is due in part to the fact that hospitals moved to PPS at the beginning of their own fiscal years, so the first year in which all Medicare participating hospitals are under PPS began October 1, 1984. Also, in the first year of the program, the portion of payments based on regional and national average DRG costs was small (25 percent) compared to the historical hospital-based portion (75 percent). The evidence is further weakened by the fact that there are few causal links that can be demonstrated between observed changes in the health care system and PPS. *The greatest deficiency in the evidence, however, is that most of it is not conceptually linked to the ultimate outcomes of health care.* It is simply not possible to assess, for example, whether the observed changes in length of stay have had any impact—for good or bad—on the quality of care given to Medicare beneficiaries. To answer that question, more refined analyses, using better indicators of quality, will be required.

What little evidence is available from the first year under PPS tends to confirm some predictions

based on analysis of financial incentives and contradict others. For instance, contrary to expectations, admission rates in PPS hospitals decreased slightly since the payment system was instituted. There is evidence in line with predictions, however, that PPS is influencing the already decreasing ALOS for Medicare patients. Staffing trends also have followed expectations; the number of FTE personnel has declined. Because admissions have decreased, the number of FTE employees per 100 patients has increased, but those employees may be treating sicker patients than they were treating before PPS.

The only compelling evidence of significant behavioral changes in the first year of PPS is the drop in ALOS, which is probably only partly due to PPS; and extensive hospital investment in information systems, which is probably due primarily to PPS.

Many of the predictions about the impacts of Medicare's PPS are based on evidence from other prospective payment programs. Analyses of these programs yield three general conclusions relevant to PPS. First, many of the impacts of prospective payment systems take time to develop. Second, the impacts may vary considerably according to the specific characteristics of each program. And, third, while many effects can be predicted by theory, some important impacts may be unexpected and some expected impacts may never materialize. A successful evaluation strategy for PPS must reflect these lessons.