Vulnerability of Rural Hospitals to Medicare Outpatient Payment Reform

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Because the Balanced Budget Act (BBA) of 1997 requires implementation of a Medicare prospective payment system (PPS) for hospital outpatient services, the authors evaluated the potential impact of outpatient PPS on rural hospitals. Areas examined include: (1) How dependent are rural hospitals on outpatient revenue? (2) Are they more likely than urban hospitals to be vulnerable to payment reform? (3) What types of rural hospitals will be most vulnerable to reform? Using Medicare cost report data, the authors found that small size and government ownership are more common among rural than urban hospitals and are the most important determinants of vulnerability to payment reform.

INTRODUCTION

Under the BBA, a PPS for Medicare hospital outpatient services was to be implemented in 1999. (However, HCFA has recently announced that updating information systems to be compliant with the year 2000 will delay the implementation of outpatient PPS.) The move from a quasi-retrospective cost-based system to a PPS for outpatient services may constrain the ability of hospitals to generate revenue from these services. Although outpatient services have become an increasingly important source of revenue for acute care hospitals in general, these services may be critical to the survival of some rural hospitals. A major concern is that Medicare outpatient prospective payment reform could further harm rural hospitals that are already struggling to remain financially viable.

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OBJECTIVES

To evaluate the potential impact of Medicare outpatient payment reform on rural hospitals, we address the following research questions:

- How dependent are rural hospitals on revenue from outpatient services in general and on revenue from outpatient services provided to Medicare beneficiaries? How has this changed over time? How does this compare with urban hospitals?
- Are rural hospitals more likely than urban hospitals to be vulnerable to the effects of Medicare outpatient payment reform?
- What types of rural hospitals will be most vulnerable to the effects of Medicare outpatient payment reform?

BACKGROUND

When Congress enacted a PPS for inpatient services, analysts were concerned that rural hospitals would be more adversely affected than urban hospitals (Rosko and Broyles, 1984; Sheingold, 1986). These concerns were partly realized in the years immediately following inpatient PPS. Rural hospitals had

substantially lower margins on Medicare services than urban hospitals, and 10 percent of rural hospitals closed in the 1980s (Congressional Budget Office, 1991).

Although one study showed that greater Medicare involvement was associated with reduced patient profitability in rural hospitals (Rizzo, 1991), others have shown that Medicare payment was not a primary reason for the poor financial condition of rural hospitals during this period (Prospective Payment Assessment Commission, 1990; Guterman et al., 1990). Among other factors, declining rural populations, dramatic reductions in admissions, and disproportionately increased per case costs contributed to declining margins in rural hospitals (Prospective Payment Assessment Commission, 1990; U.S. Department of Health and Human Services, 1989; Hendricks et al., 1989).

Over the years, concerns about access in rural areas has led Congress to design a number of programs to assist financially vulnerable rural hospitals (Buto, 1996). Three of these programs, the Sole Community Hospital (SCH) Program, implemented in 1972, the Essential Access Community Hospital/Rural Primary Care Hospital Program, implemented in 1993, and the Medicare Dependent Small Rural Hospital Program, operating between 1990 and 1993, allow selected rural hospitals to receive cost-based reimbursement. Also introduced was a program that classified large rural hospitals that were providing more complex and diverse services than their rural counterparts as rural referral centers. These hospitals were paid a PPS rate using the standardized amount given to hospitals in "other urban" locations, rather than that paid to rural hospitals, increasing their average payment rate. Until 1995, when HCFA equalized payment rates for these two locations, rural referral centers benefited substantially from this designation. Rural referral centers still qualify for disproportionate-share payments and, potentially, higher wage indexes than other rural facilities.

These programs have played a major role in improving the rural hospital's fiscal condition. By 1991, more than one-half of rural hospitals qualified for one or more of these special payment categories (Congressional Budget Office, 1991). A study conducted by the Prospective Payment Assessment Commission (ProPAC) found that only rural hospitals receiving targeted subsidies had positive PPS margins (Prospective Payment Assessment Commission, 1991).

The BBA continues the Federal tradition of providing assistance to rural facilities. Most significantly, the program for essential access community hospitals and rural primary care hospitals will be replaced by the Rural Hospital Flexibility Program and an expanded program for critical access hospitals (CAHs). To qualify for designation as a CAH, rural hospitals must meet several criteria, including:

- Being a non-profit or public hospital.
- Having no more than 15 acute care inpatient beds (if using swing beds, no more than 25) in use at any one time.
- Providing inpatient care for no more than 96 hours.
- Being located more than a 35-mile drive from another hospital (or 15 miles in areas with mountainous terrain or only secondary roads) or certified by the State as a necessary provider.

Hospitals currently designated as medical assistance facilities in Montana or rural primary care hospitals will be designated as CAHs if they meet the eligibility requirements. CAHs will be paid on the basis of reasonable costs for both inpatient and outpatient services.

Despite the importance of these special payment designations, they offer rural hospitals relief primarily by changing the basis for Medicare inpatient payment. Only CAHs will be exempted from the new PPS for outpatient services.

Medicare payments for outpatient services are an important source of revenue for many rural hospitals, helping to fill the void left by the introduction of inpatient PPS and the relative absence of private payers. The average rural hospital obtains nearly 60 percent of its revenue from the Medicare and Medicaid programs (compared with less than 50 percent for the average urban hospital). In response to inpatient PPS, hospitals (both rural and urban) have allocated large percentages of administrative overhead to outpatient cost centers. This movement represents a cross-subsidization of inpatient services and has occurred to a much greater extent among rural hospitals (Carey, 1994). There is some concern that strategic opportunities to respond to outpatient PPS may be limited for some rural hospitals.

STUDY METHODS

We conducted both a descriptive and a multivariate analysis of Medicare cost report data to address our research questions. The descriptive analysis provides trends in dependence on outpatient revenue and differences in financial performance between non-metropolitan (rural) and metropolitan (urban) hospitals over fiscal years 1990-1995. (Although there are many definitions of urban and rural, the definition we use is one HCFA uses for Medicare hospital payment policy.) We analyze the data for approximately 5,000 short-term hospitals in the United States (excluding U.S. territories).

The multivariate analysis is cross-sectional and focuses on 4,491 short-term hospitals operating in fiscal year 1995—including 2,066 rural hospitals. The figure of 4,491 includes approximately 87 percent of eligible hospitals. This analysis combines Medicare cost report data with other data files to enhance our understanding of hospital characteristics and features of the local market. We use the 1995 American Hospital Association (AHA) Annual Survey of Hospitals data base to provide supplementary structural and administrative information, such as affiliation with a multihospital system, and the Herfindahl Index to measure the competitiveness of the local hospital market. (The Herfindahl Index is constructed by dividing hospital-specific discharges as a percentage of all hospital discharges in a county. The greater the index, the lower is local market competition.) In addition, the 1995 Area Resource File, a county-level file produced by the Health Resources and Services Administration, is used to construct hospital market-area characteristics, including per capita income and population density. Finally, PPS impact files contain classifications used by HCFA for payment purposes of Medicare-certified providers, such as SCHs, as well as distance to the nearest competitor.

To enrich the measurement of financial performance in our analysis, we include two financial ratios to measure profitability trends over time (total margin and operating margin) and create a proxy for cumulative cash flow from operating activities by summing net profit or loss from operations and depreciation expense. Financial performance is aggregated over the 1992-1995 period. This allows us to smooth sometimes large annual fluctuations in performance attributable to accounting practices and capture the general trend in performance over time.

Financial performance continues to be proxied by a single measure of profitability (total profit margin) in many econometric analyses, however, some research efforts have shown the benefit of using a combination of cash-flow indicators and standard financial ratios for a multiyear period (Kane, 1991; Cleverley and Nilsen, 1980). Ideally, analysis of all three financial statements, the balance sheets, income statement, and cash-flow statement, is needed to obtain a clear picture of financial status. At a minimum, the use of accrual and cash-based financial measures can ensure that a more accurate financial assessment is obtained. Hospitals with healthy accrual-based profit margins that leave the hospital "cash poor" and unable to meet financial requirements are not as financially healthy as the profit margin might suggest. Similarly, hospitals with poor profit margins but large expense accruals that increase cash reserves may be much more financially sound than they appear.

Although additional financial indicators, such as those measuring liquidity and capital structure, would enhance and improve the accuracy of our assessment of hospital financial performance, data constraints as well as the development of a cohesive and empirically sound methodology for combining these measures is beyond the scope of this study. By combining profit margins with a cash-flow indicator and by examining multiple years of data, we improve upon the financial assessments of many other analyses.

Specification of Dependent Variables

Because a hospital's vulnerability to outpatient payment reform depends on financial performance and the overall financial dependence on Medicare outpatient revenue, we develop several composite indicators of vulnerability as our dependent variables. Using State fixed-effect logistic regression models, we estimate the probability of meeting these criteria conditional on independent variables. State fixed-effect models control for geographic variations, such as in hospital regulation. Our specifications of the dependent variables for two of these models that represent the spectrum of our results are:

Stringent Criteria: Hospitals meeting these criteria are uncontested poor financial performers and among the most dependent on Medicare outpatient revenue. These hospitals had negative total and operating margins, on average, for the 1992-1995 period and had negative cumulative cash flow over this period. In addition, these hospitals received at least 11 percent of their total revenue from Medicare outpatient payments, representing the top quartile of all hospitals.

Moderate Criteria: Hospitals in this category had negative operating margins over the 1992-1995 period and negative cumulative cash flow. These hospitals may have had positive total margins due to non-operating revenue but were unable to break even on patient care. Hospitals meeting these criteria also were required to be among the top one-half of all hospitals with respect to their dependence on Medicare outpatient services, deriving 8 percent or more of their total revenue from Medicare outpatient payments.

Definition of Independent Variables

Urban/rural designations for each of the hospitals are based on standard Office of Management and Budget designations of the metropolitan or non-metropolitan status of the county in which the hospital is located. We also classify rural hospitals into finer gradations of urban influence, using the Urban Influence codes (Ghelfi and Parker, 1997). Under this classification system, non-metropolitan (rural)

counties are categorized by their adjacency to urban areas (e.g., adjacent to large metropolitan area, adjacent to small metropolitan area, not adjacent) and the size of the largest city partly or wholly in the county. These categories capture often large differences among rural communities in their access to larger population centers and, hence, connection to a range of health care services. In our analyses, we distinguish between both non-metropolitan counties that contain all or part of a city with at least 10,000 residents and those with smaller or no cities, and non-metropolitan counties that are adjacent or not adjacent to metropolitan counties.

Rural Hospital Characteristics

Because of the importance of special payment status on the financial performance of rural hospitals, we provide separate estimates for three types of rural facilities: SCHs, rural referral centers, and other rural. Given that essential access community hospitals, medical assistance facilities, and Medicare-dependent small rural hospitals are paid as SCHs, in our presentation of the data, we include all of these in the SCH category. These programs have been dynamic, with the number of participants varying from year to year. Because annual data on many of these special payment categories are not available from HCFA, we classify hospitals into these payment groups if they ever participated in the years for which we had data. Thus, hospitals in these categories represent a type of hospital that would qualify, rather than actual participants in the year of analysis.

Because CAHs will be exempted from prospective payment for outpatient services under Medicare and may otherwise differ from other hospitals, we examine separately the financial performance and potential vulnerability of hospitals that may be designated as CAHs. Although the numbers of hospitals that might qualify as CAHs is yet uncertain, we use a broad definition to identify potential CAHs; this definition includes those that are medical assistance facilities or rural primary care hospitals, as well as non-profit or public hospitals that meet the bed-size criteria. That is, for hospitals without any Medicare swing-bed discharges (identified from the HCFA cost report data), we include non-profit or public hospitals with fewer than 15 beds; for hospitals that had some Medicare swing-bed discharges, we increase this maximum to 25 beds. Our definition is broad because it does not impose mileage restrictions for eligibility; however, it does not include larger hospitals that might downsize to become eligible for the program. It should be noted that some of these hospitals already might be classified as SCHs.

The Medicare Swing-Bed Program, implemented in the 1980s, provides rural hospitals with greater flexibility in service use, which could improve their financial condition and potentially dampen the impact of outpatient payment reform. Under this program, hospitals may use beds for either acute or long-term care, depending on their patients' needs. Nearly one-half of all rural hospitals participate in this program (Buto, 1996). Swing-bed participants are identified in our model and are defined as those hospitals with any Medicare swing-bed discharges in a given year.

Another indicator of a hospital's vulnerability to outpatient payment reform includes whether the hospital has an affiliation with a multihospital system. Hospitals with strong affiliations to a broader hospital system may have access to additional financial resources that could currently be in relatively better financial shape. Linkages to larger hospitals also could soften the impact of outpatient payment reform. For approximately 350

hospitals, the hospital did not complete the AHA survey, and therefore, data on their affiliation with a multihospital system are not available. Because these hospitals were more often small and urban, we did not want to exclude them from our analysis. Therefore, we impute a value for affiliation with a multihospital chain using a State fixed-effect probit model of the likelihood of being affiliated with a multihospital system.

We also explored alternative measures of the penetration of managed care into a hospital's market. In the end, we determined that the measures available from our data sources were not adequate to capture differences among hospitals in the extent of their involvement with managed care.

Finally, we include a standard array of hospital characteristics that may affect hospital profitability. These include bed size, average length of stay, type of control, teaching status, and Medicare dependence, proxied by Medicare inpatient discharges as a percent of total. Although other studies examining hospital profitability have included occupancy rate and found it to be an important predictor (Guterman et al., 1990; Rizzo, 1991), the direction of causality for this variable is unclear. A low occupancy rate does affect costs per case and thus profitability. However, low occupancy is likely to be an indicator that the hospital is non-competitive for other reasons. From this perspective, occupancy rate more appropriately should be considered as a performance indicator, rather than a factor explaining poor performance. We excluded it from our models after determining that the statistical significance of our parameters was not modified and our conclusions were not altered by omitting this variable.

Market-Area Characteristics

Hospital market-area characteristics can play an important role in determining a hospital's vulnerability to outpatient payment reform. For example, hospitals in highly competitive markets may be less able to increase payment rates in order to cover losses. Also, hospitals serving relatively poor communities will have difficulties increasing their payment rates. We include three county-level measures of market-area characteristics in our multivariate analysis. These include per capita income; population density; and the Herfindahl Index.

RESULTS

Dependence on Outpatient Revenue

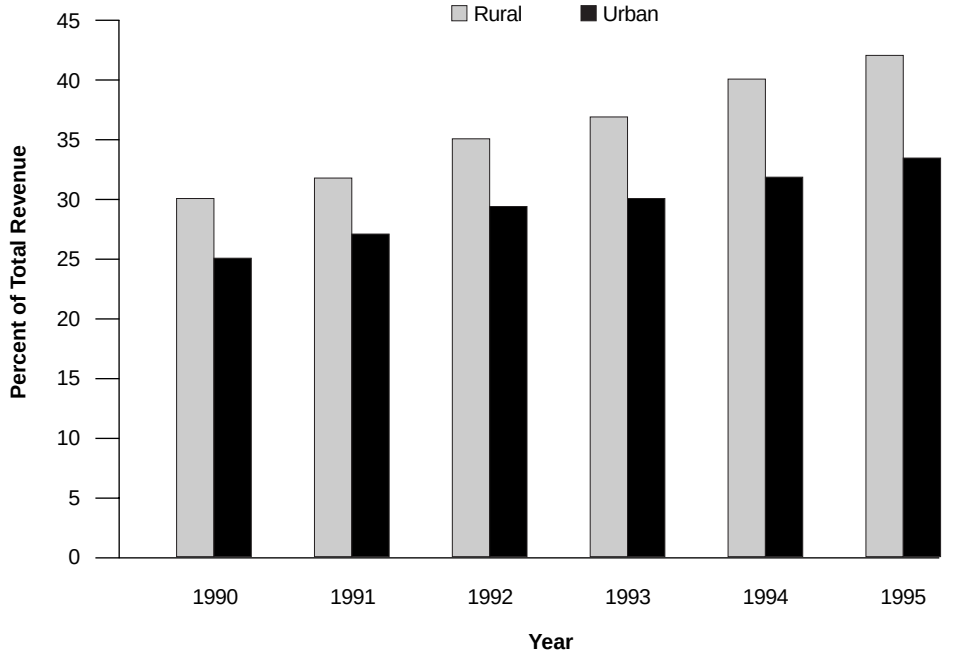
Outpatient services have become a relatively more important source of revenue for rural hospitals than for urban hospitals, and the difference has grown in recent years. By 1995, rural hospitals obtained around 42 percent of total revenue from outpatient services on average (Figure 1). In contrast, the average urban hospital derived only one-third of total revenue from outpatient services. Medicare outpatient revenue comprised approximately 10 percent of total revenue for rural hospitals and around 7 percent for urban hospitals in 1995 (Figure 2).

Urban and Rural Differences

A higher proportion of rural hospitals than urban hospitals met our criteria for being vulnerable to outpatient payment reform; that is, they were experiencing financial difficulties and were highly

Figure 1

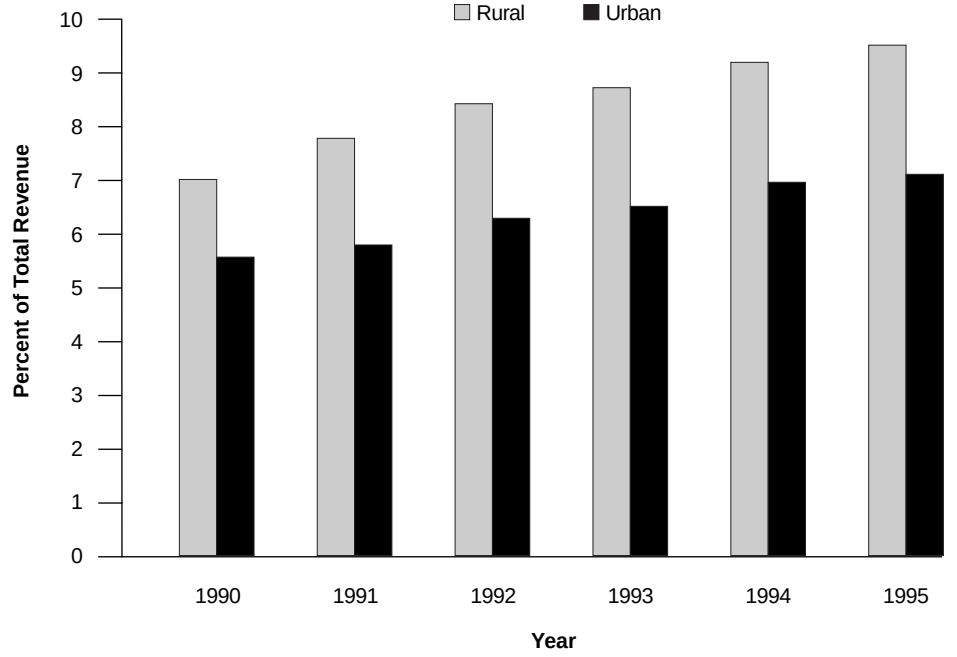
Average Percent of Total Revenue Obtained from Outpatient Services, by Rural and Urban Hospitals: United States, 1990-1995



SOURCE: Hospital Cost Report Information System (Health Care Financing Administration); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

Figure 2

Average Percent of Total Revenue Obtained from Medicare Outpatient Services, by Rural and Urban Hospitals: United States, Fiscal Years 1990-1995



SOURCE: Hospital Cost Report Information System (Health Care Financing Administration); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

Table 1

Multivariate Analysis with Moderate and Stringent Composite Indexes as Dependent Variables: United States, Fiscal Years 1990-1995

Variable	Moderate Criteria		Stringent Criteria	
	Coefficient	*T*-statistic	Coefficient	*T*-statistic
Log Likelihood	-1,013.91	—	-494.06	—
Rural[1]	0.0213	-1.48	0.0057	0.56
Government[2]	*0.0780	*-3.29	-0.0039	-0.24
Non-Profit[2]	0.0290	1.25	-0.0024	-0.15
Non-Teaching[3]	-0.0669	-1.53	0.0104	0.25
Low Teaching[3]	-0.0199	-0.43	0.0454	1.07
Chain[4]	-0.0061	-0.49	-0.0070	-0.84
Swing[4]	0.0193	1.69	0.0099	1.22
Length of Stay	0.0003	0.83	-0.0001	-0.41
Number of Beds per Hundred	*-0.1437	*-10.53	*-0.0914	*-7.93
1993 Per Capita Income per Thousand	0.0024	0.15	0.0060	0.58

* Denotes variable is significant at the 95-percent level.

[1] Reference group is urban.

[2] Reference group is for-profit.

[3] Reference group is high teaching.

[4] Binary variable.

NOTES: Coefficients represent estimates of marginal effect. Moderate criteria include negative operating margin, negative cash flow, and being in the top one-half of dependence on Medicare outpatient revenue. Stringent criteria include negative total margin, negative operating margin, negative cash flow, and being in the top quartile of dependence on Medicare outpatient revenue.

SOURCES: Medicare Cost Report files (Health Care Financing Administration); Area Resource Files (Health Resources and Services Administration); and Annual Survey of Hospitals (American Hospital Association); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

dependent on Medicare outpatient revenue (Figure 3). Roughly 15 percent of rural hospitals are considered vulnerable based on the moderate criteria (poor performance on operating margins and in the top one-half of dependence on Medicare outpatient revenue), compared with only 4 percent of urban hospitals. Approximately 5 percent of rural hospitals are vulnerable based on stringent criteria (poor total and operating performance and in the top quartile of dependence on Medicare outpatient revenue). In contrast, only 1 percent of urban hospitals are considered vulnerable using these more stringent criteria.

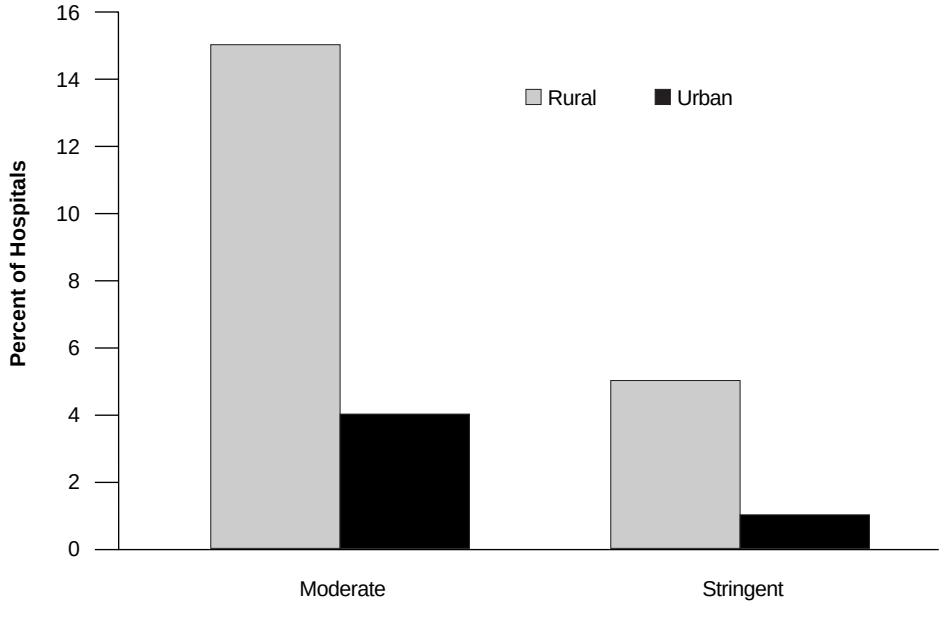
Marked differences in vulnerability between urban and rural hospitals stem from systematic differences in their characteristics. Table 1 presents the results of the logistic regressions for the two composite measures of vulnerability, and Table 2 presents the characteristics of the rural and urban hospitals included in our analysis. These results show the most important predictor of vulnerability is small size (significant for both criteria at the 99-percent confidence level), and bed size is the only statistically significant predictor of vulnerability for our more stringent criteria.

Notably, small hospitals are a dominant feature of rural areas. For example, urban hospitals average 231 beds; in contrast, rural hospitals average only 74 beds (Table 2). Also, small hospitals (with fewer than 25 beds) comprise 10 percent of rural hospitals, compared with 2 percent of urban hospitals. The importance of size to a hospital's vulnerability is dramatically illustrated in Figure 4. More than one-third of rural hospitals and 15 percent of urban hospitals with fewer than 25 beds met the moderate criteria, compared with 2 percent of rural and urban hospitals with more than 100 beds. A similar, although less pronounced, relationship is observed using the stringent criteria (Figure 5).

For our more moderate criteria, government ownership is also a statistically significant predictor of vulnerability. Government-owned hospitals are 8 percent more likely to

Figure 3

Percent of Hospitals Considered Vulnerable to Outpatient Payment Reform Using Both Moderate and Stringent Criteria: United States, 1995[1]



[1] Most of the evaluation criteria are measured using data for fiscal year 1995, except for financial performance, for which we used a cumulative measure for fiscal years 1992-1995.

NOTES: Moderate criteria include poor performance on operating margins and being in the top one-half of dependence on Medicare outpatient revenue. Stringent criteria include poor total and operating performance and being in the top quartile of dependence on Medicare outpatient revenue.

SOURCE: Hospital Cost Report Information System (Health Care Financing Administration); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

Table 2

Comparison of Urban and Rural Hospitals Sample Size and Mean for Independent Variables United States: Fiscal Years 1990-1995

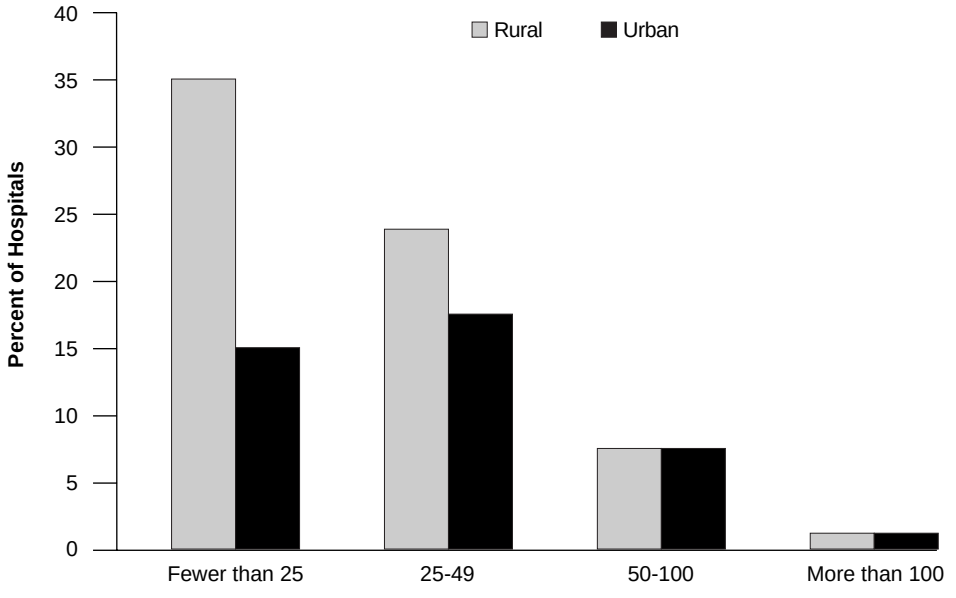
Variable	Urban Hospitals		Rural Hospitals	
	Number	Percent or Mean	Number	Percent or Mean
		Percent		Percent
For-Profit	391	16	144	7
Non-Profit	1,676	69	1,015	49
Government	358	15	907	44
High Teaching	230	9	3	0
Low Teaching	689	28	70	3
Non-Teaching	1,506	62	1,993	96
Member of Chain—Yes	1,606	66	647	31
Member of Chain—No	819	34	1,419	69
Swing-Bed Use—Yes	200	8	838	41
Swing-Bed Use—No	2,225	92	1,228	59
Medicare Discharge to Total	2,425	40	2,066	50
		Mean		Mean
Average Length of Stay in Days	2,425	5.3	2,066	5.4
Bed Size	2,425	231	2,066	74.3
Herfindahl Index	2,425	0.3	2,066	0.7
Per Capita Income	2,425	$21,432	2,066	$16,218
Population per 10,000 Square Miles	2,425	2,007	2,066	47

NOTES: Teaching status is evaluated using a ratio of full-time interns and residents to beds. Non-teaching status indicates the ratio was 0. Low teaching indicates the ratio was between 0 and 25 percent; high teaching means the ratio was greater than 25 percent.

SOURCES: Medicare Cost Report files (Health Care Financing Administration); Area Resource Files (Health Resources and Services Administration); and Annual Survey of Hospitals (American Hospital Association); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

Figure 4

Percent of Hospitals Meeting Moderate Criteria to Determine Vulnerability: United States, 1995[1]



[1] Most of the evaluation criteria are measured using data for fiscal year 1995, except for financial performance, for which we used a cumulative measure for fiscal years 1992-1995.

NOTE: Moderate criteria include poor performance on operating margins and being in the top one-half of dependence on Medicare outpatient revenue.

SOURCE: Hospital Cost Report Information System (Health Care Financing Administration); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

meet these criteria than for-profit hospitals. Again, government ownership is much more common among rural (44 percent) than urban (15 percent) hospitals.

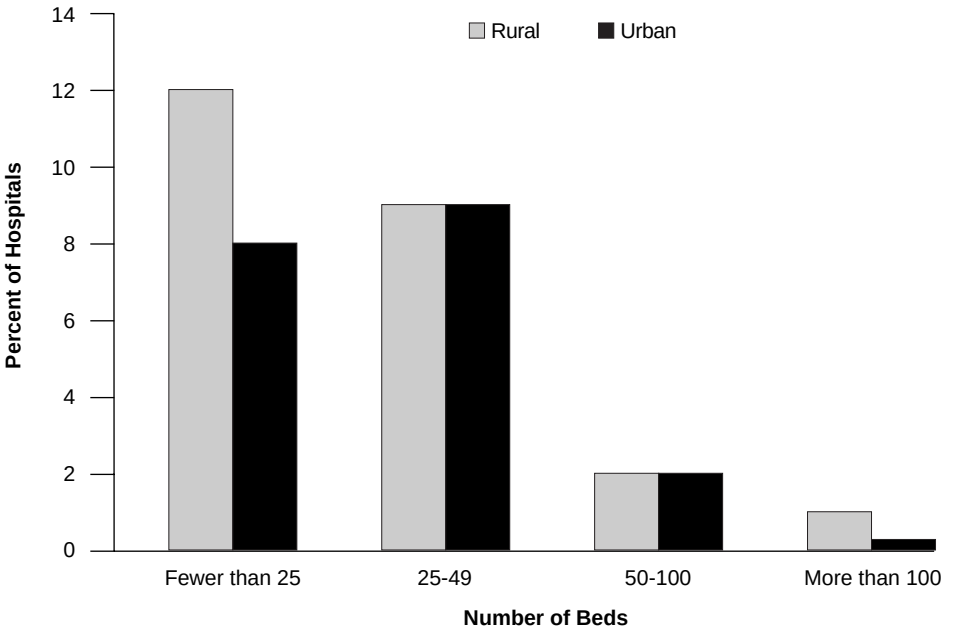
The fact that government ownership is an important predictor for hospitals meeting our moderate criteria but is not an important predictor of our stringent criteria reflects the fact that many government hospitals make losses on patient operations. These hospitals are much more reliant on non-patient revenue, such as local taxes and donations, for their survival. Our moderate criteria require a hospital to have been making losses on patient operations over the last 4-year period but do not impose any restrictions on total profitability. In general, rural hospitals (regardless of ownership) are more reliant on non-patient revenue than are urban hospitals. Close to 55 percent of rural hospitals were not making a profit on patient operations in 1995, compared with 48 percent of urban hospitals; yet about 80 percent of both groups were operating with positive total margins.

Another marked distinction between urban and rural hospitals is their affiliation with multihospital systems. Although not significant in the model, hospitals with strong affiliations to a broader hospital system may have access to additional financial resources, which could soften the impact of the reform. In other words, this may be more an indicator of a hospital's future flexibility to adapt than its current vulnerability to outpatient payment reform. Although two-thirds of urban hospitals are members of a chain, only one-third of rural hospitals are affiliated with a chain.

The fact that small size plays such a predominant role in predicting vulnerability may seem surprising. However, we believe

Figure 5

Percent of Hospitals Meeting Stringent Criteria to Determine Vulnerability: United States, 1995[1]



[1] Most of the evaluation criteria are measured using data for fiscal year 1995, except for financial performance, for which we used a cumulative measure for fiscal years 1992-1995.

NOTE: Stringent criteria include poor total and operating performance and being in the top quartile of dependence on Medicare outpatient revenue.

SOURCE: Hospital Cost Report Information System (Health Care Financing Administration); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

these findings are indicative of strong economies of scale in hospital operations. Small hospitals are substantially more likely to be marginal financial performers, regardless of location, teaching status, or other community or hospital characteristics. Also, small hospitals are more likely to serve a role as community health clinics and be relatively more dependent on outpatient revenue.

In order to examine why other variables, and specifically the rural indicator, were not significant, we ran several other specifications of these models, leaving various independent variables out. In each case, only small size and/or government ownership were statistically significant. We have presented our results only for our more robust model here. Additionally, we interacted rural status with type of ownership and rural status with bed size. The significance of our other dependent variables did not change, but the interaction terms were strongly significant. These findings indicate that rural government hospitals and rural small hospitals are more likely to be vulnerable than urban government or urban small hospitals. These conclusions can also be reached by examining our equation for rural hospitals alone, discussed later in the text.[1]

Features of Vulnerable Rural Hospitals

Using logistic regression, we examined a variety of characteristics of rural hospitals and their markets that might influence

[1] Details of our specifications and results from other models may be obtained from the authors.

their vulnerability to outpatient payment reform. These included special payment status (e.g., SCHs, rural referral centers), designation as a potential CAH, level of urban influence, participation in the Medicare swing-bed program, per capita income, and population density.

The results of our State fixed-effect logistic regressions are presented in Tables 3 and 4. Our findings mirror urban/rural comparisons already presented, although the size of significant parameters generally doubles. The only statistically significant predictor of meeting our stringent criteria was bed size; bed size and government ownership were the only statistically significant variables for our more moderate criteria. Our estimates show that status as a government hospital increased the chance that a rural hospital would be moderately vulnerable by 13 percent, and hospitals with 50 beds were 48 percent more likely to meet these criteria than a hospital with 150 beds (Table 3).

Unexpectedly, hospitals having or potentially meeting special payment designations (e.g., SCHs, CAHs) are not significantly more vulnerable than other rural hospitals. This is because SCHs in general fared better financially than other rural hospitals, while potential CAHs were less dependent on outpatient revenues than other rural hospitals. We were particularly concerned about these two hospital groups because of the implications that closure might have on access to care.

To more explicitly examine access issues, we studied the distance to the nearest competitor for those rural hospitals meeting our vulnerability criteria. Most hospitals meeting our more moderate criteria for vulnerability (more than 80 percent) were within 25 miles of the nearest competitor. Fifty-two hospitals meeting our moderate-vulnerability criteria and 15 hospitals meeting our stringent criteria were 25 miles or more from their nearest competitor. All but three of the vulnerable hospitals located 25 miles or more from another hospital were SCHs. (Note that Medicare-dependent facilities and essential access community hospitals also were designated as SCHs in our study because they receive similar payment concessions from Medicare.) These findings suggest that, although as a group, SCHs may not be more vulnerable than other rural hospitals, some will be, and in these cases, access is likely to be a concern.

Potential CAHs reported significantly poorer financial results than other rural hospitals. These small, government-owned or non-profit hospitals had total margins nearly 3 percentage points lower than other rural hospitals. On average, these types of hospitals were making operating losses of 16 percent in fiscal year 1995, and more than 60 percent had negative cash flow in that year. However, these hospitals also derived a significantly lower portion of their revenue from Medicare outpatient services than did their peers. Given the small size of these hospitals, they may serve more as triage facilities providing only limited outpatient and inpatient services. Because of their lessened reliance on Medicare outpatient services, these hospitals were not significantly more likely than other rural hospitals to meet vulnerability criteria.

DISCUSSION

As we anticipated, outpatient services have become relatively more important for rural hospitals than for urban hospitals. By 1995, rural hospitals obtained more than two-fifths of total revenue from outpatient services. By comparison, outpatient revenue comprised one-third of urban hospitals' total revenue. Although Medicare outpatient revenue still contributes less than

Table 3

Multivariate Analysis Using Moderate Vulnerability Composite Indicator, Rural Hospitals Only: United States, Fiscal Years 1990-1995

Variable[1]	Model 1		Model 2		Model 3		Model 4	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Log Likelihood	-670.80	—	-671.12	—	-670.39	—	-670.99	—
Rural Adjacent County[2]	0.0186	0.94	—	—	—	—	—	—
Sole Community Hospital[3]	—	—	0.0101	0.49	—	—	—	—
Potential Critical Access Hospital[4]	—	—	—	—	0.0393	1.30	—	—
Rural County Without a City[5]	—	—	—	—	—	—	0.0198	0.71
Government[6]	*0.1334	*2.29	*0.1312	*2.26	*0.1289	*2.22	*0.1300	*2.23
Not for Profit[6]	0.0614	1.05	0.0614	1.05	0.0595	1.02	0.0607	1.04
Non-Teaching[7]	1.5342	0.00	1.5366	0.00	1.5901	0.00	1.5394	0.00
Low Teaching[7]	1.3721	0.00	1.3763	0.00	1.4274	0.00	1.3781	0.00
Chain[8]	-0.0103	-0.41	-0.0097	-0.39	-0.0117	-0.47	-0.0101	-0.40
Swing[8]	-0.0000	-0.00	-0.0012	-0.05	-0.0048	-0.22	-0.0008	-0.03
Length of Stay	0.0015	1.52	0.0015	1.50	0.0015	1.48	0.0016	1.61
Beds	*-0.4838	*-9.88	*-0.4800	*-9.81	*-0.4537	*-8.71	*-0.4717	*-9.28
1993 Per Capita Income (10,000)	-0.0028	-0.07	-0.0032	-0.09	-0.0090	-0.25	-0.0032	-0.09

* Denotes variable is significant at the 95-percent level.

[1] Dependent variables are negative operating margin, negative cash flow, and being in the top 50 percent of Medicare outpatient dependence with State fixed effect.

[2] Reference is rural-non-adjacent county.

[3] Reference is rural, non-sole community hospital.

[4] Reference is rural, non-potential critical access hospital.

[5] Reference is rural with a city of 10,000 or more.

[6] Reference group is for-profit.

[7] Reference group is high teaching.

[8] Binary variable.

SOURCES: Hospital Cost Report Information System (Health Care Financing Administration); Area Resource Files (Health Resources and Services Administration); and Annual Survey of Hospitals (American Hospital Association); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

Table 4

Multivariate Analysis Using Stringent Vulnerability Composite Indicator, Rural Hospitals Only: United States, Fiscal Years 1990-1995

Variable[1]	Model 1		Model 2		Model 3		Model 4	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Log Likelihood	-342.43	—	-342.53	—	-342.61	—	-342.61	—
Rural Adjacent County[2]	0.0087	0.60	—	—	—	—	—	—
Sole Community Hospital[3]	—	—	0.0061	0.41	—	—	—	—
Potential Critical Access Hospital[4]	—	—	—	—	-0.0003	-0.01	—	—
Rural County Without a City[5]	—	—	—	—	—	—	0.0019	0.09
Government[6]	-0.0027	-0.07	-0.0045	-0.11	-0.0032	-0.08	-0.0036	-0.09
Not-for-Profit[6]	0.0014	0.03	0.0007	0.02	0.0017	0.04	0.0014	0.03
Non-Teaching[7]	0.7478	0.00	0.7484	0.00	0.7476	0.00	0.7472	0.00
Low Teaching[7]	0.7449	0.00	0.7473	0.00	0.7455	0.00	0.7451	0.00
Chain[8]	-0.0151	-0.83	-0.0150	-0.83	-0.0149	-0.82	-0.0150	-0.82
Swing[8]	0.0107	0.66	0.0100	0.62	0.0104	0.64	0.0104	0.64
Length of Stay	-0.0000	-0.10	-0.0001	-0.13	-0.0000	-0.10	-0.0000	-0.08
Beds	*-0.2433	*-6.41	*-0.2418	*-6.35	*-0.2430	*-5.73	*-0.2418	*-6.19
1993 Per Capita Income (10,000)	-0.0149	-0.55	-0.0148	-0.55	-0.0159	-0.59	-0.0158	-0.59

* Denotes variable is significant at the 95-percent level.

[1] Dependent variables are negative total margin, negative cash flow, and being in the top 25 percent of Medicare outpatient dependence with State fixed effect.

[2] Reference is rural-non-adjacent county.

[3] Reference is rural, non-sole communitiy hospital.

[4] Reference is rural, non-potential critical access hospital.

[5] Reference is rural with a city of 10,000 or more.

[6] Reference group is for-profit.

[7] Reference group is high teaching.

[8] Binary variable.

SOURCES: Hospital Cost Report Information System (Health Care Financing Administration); Area Resource Files (Health Resources and Services Administration); and Annual Survey of Hospitals (American Hospital Association); data analysis by the Project HOPE Walsh Center for Rural Health Analysis, 1999.

10 percent of total revenue for rural hospitals (compared with 7 percent of urban hospitals' total revenue), its relative importance to rural hospitals has increased in recent years.

Specializing in the provision of outpatient services, in general, has been one of the more successful survival strategies employed by rural hospitals. Other strategic options, such as offering newer, specialized facilities or investing in cutting-edge technology, have been utilized in the past by some hospitals to remain in operation, but these options often require large capital investments that may be elusive to often cash-poor rural facilities. Although mergers and acquisitions have been an important route for survival of threatened urban hospitals, a relatively small proportion of rural hospitals have merged or been assimilated into multihospital systems.

Because of their small size, rural hospitals are more likely to be vulnerable than urban hospitals to Medicare outpatient payment reform. Nearly one-half of rural hospitals are small, having 50 or fewer beds. Small hospitals are relatively more dependent on outpatient revenue and are more likely to be experiencing financial difficulties. Notably, small hospitals also experienced the most adverse impact of inpatient PPS. Smaller hospitals with lower volume have a harder time spreading fixed operating costs, resulting in higher costs per case.

Rural hospitals have faced many threats to their survival in recent years. Some rural areas have experienced continual outmigration, which has been exacerbated by rural residents choosing to bypass local facilities in favor of urban facilities. Resulting reductions in service volume have led to increased costs per case for hospital services (Congressional Budget Office, 1991). More than one-half of rural hospitals were not making a profit on patient operations in 1995. For these hospitals, non-operating revenue sources such as investment income, transfers from affiliates, philanthropic donations, and government appropriations have been crucial for covering these operating losses.

Because rural hospitals perform a crucial role in the community as the cornerstone providing a wide spectrum of health care services, there is a strong incentive for ensuring their survival. Rural hospitals are also major employers and are critical to attracting health care professionals and other industry to the area (Congressional Budget Office, 1991). As other researchers have noted, rural communities have often subsidized shortfalls in patient revenue with taxes (Moscovice, 1989). Although such a strategy may be viable in the short term, it may be unsustainable in the long term. Unlike operating results that are volume-driven, non-operating revenue is usually more static and may not be elastic enough to increase with each new external policy change. Rural community resources to support profound and lasting financial losses are also likely to be marginal (Wellever and Radcliffe, 1998).

Reductions in Medicare outpatient payments are likely to become a public policy issue. As this article was being completed, the parameters for a hospital outpatient payment system had just been released by HCFA (*Federal Register*, 1998). According to simulations done by HCFA, low-volume hospitals (fewer than 5,000 visits per year) are projected to experience Medicare payment reductions of 17 percent under the new system, compared with 4 percent payment reductions for hospitals in general. More than 75 percent of low-volume hospitals in HCFA's analysis were rural. Based on these findings, HCFA has proposed phasing in the payment system for low-volume Medicare-dependent or SCHs to lessen the short-term impact of outpatient

reform. HCFA also proposed to further limit the phase-in to low-volume Medicare-dependent hospitals or SCHs that had negative operating margins.

Although HCFA's simulations suggest the net effect may be small (based on our calculations, less than a 2-percent reduction in total revenue for small rural hospitals), this reduction in revenue should be considered in the context of the already poor financial condition of many small rural hospitals. In our descriptive analysis, rural hospitals of 25 beds or fewer experienced operating losses of nearly 16 percent in 1995, on average. There are other scheduled Medicare payment changes that may also negatively impact rural hospitals. These include the correction of the outpatient formula-driven overpayment, physician fee-schedule changes, changes in payment rules for rural health clinics, and the proposed skilled nursing facility and home health prospective payment systems. Given the dependence of small rural hospitals on local subsidies and the fact that HCFA's simulated impact for low-volume hospitals represents an average, this small but sustained reduction in outpatient revenue could make a difference in community decisions to continue high levels of subsidy.

We should emphasize that our findings indicate that access may be impaired in only a small number of cases (2.5 percent of rural hospitals). However, we believe our conclusions are conservative. We used strict criteria to measure potential vulnerability to outpatient payment reform. Hospitals meeting these criteria were required to have had total or operating losses over a 4-year period. Some hospitals with a better financial history may also be vulnerable. For example, hospitals that are highly dependent on Medicare outpatient revenue and are currently operating with margins close to zero may be poised to experience financial losses under Medicare outpatient payment reform. In addition, we have not identified hospitals that have experienced a recent but likely-to-be-lasting threat to survival (e.g., decline in the local economic base). Finally, our cash-flow proxy, because of data limitations, did not allow us to identify all hospitals experiencing cash-flow problems. For these reasons, our results should be considered conservative estimates of the magnitude of potential vulnerability.

Ultimately, the impact of Medicare outpatient payment reform will depend on the extent to which non-Medicare payers follow suit and on the final design of the payment system. There may be some spillover effects, as private payers adopt similar cost-savings measures. After inpatient PPS was introduced, for example, private sector payments and rates of hospitalization for non-Medicare patients declined as well (Muller, 1993; Scheffler et al., 1994). Because rural hospitals are more dependent on outpatient revenue in general than are urban hospitals, these secondary impacts could magnify the rural consequences of outpatient payment reform.

As previously noted, HCFA still had not released a final rule when we completed this study. HCFA proposed a phase-in period for low-volume SCH or Medicare-dependent hospitals but did not propose a permanent payment adjustment or exemption for these hospitals. Setting a payment differential for small hospitals per se could encourage inefficiencies to continue. Also, exempting SCHs across the board does not appear to be warranted, based on our findings. However, an exemption from an outpatient PPS for small SCHs may be desirable. These facilities have already been designated as being essential for community access to hospital services and will continue to be exempted from inpatient PPS.

In the future, small rural hospitals facing revenue reductions under Medicare outpa-

tient PPS may find it beneficial to convert to a CAH. This legislation not only offers these hospitals relief from outpatient PPS but relaxes other requirements, such as the need to provide 24-hour onsite physician staffing. Reduced staffing requirements should enable CAHs to lower their operating costs and improve their chances for survival (Blanchfield, Franco, and Mohr, to be published). The breadth of this potential safety net will depend, in part, on how many States will be willing to participate in Medicare's Rural Hospital Flexibility Program, the program under which CAHs are designated.

The legislative intent is that Medicare prospective payment for hospital outpatient services encourage efficiency. Regardless of the payment system, those hospitals that are able to provide outpatient services at a cost below Medicare payment levels, on average, will do relatively well. Inpatient PPS and the recent pressures from managed care have brought about unprecedented reductions in the cost of hospital services. Nevertheless, the initial parameters for inpatient prospective payment did have some unintended repercussions for rural hospitals. Outpatient payment reform may have similar unintended consequences. Scrutiny of the impact of outpatient payment reform is warranted, not only to ensure payment equity between urban and rural locations, but also to ensure that rural health care systems not be further weakened.

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