

Medicare dependent hospitals: Who depends on whom?

by Brigid Goody

Small rural hospitals with a large proportion of Medicare patients currently receive special treatment as Medicare dependent hospitals (MDHs) under the prospective payment system (PPS). Other high Medicare hospitals (HMHs)—both urban and rural—have sought to have the additional per case payments extended to them. Current utilization patterns, the availability of alternative facilities, and the socioeconomic and demographic characteristics of the service areas were examined to determine whether either

the current MDH or alternative HMH targeting criteria identify hospitals whose closure might impair access to care for Medicare beneficiaries residing in their service areas. Neither MDHs nor HMHs are substantially different from other hospitals in terms of providing access. While some individual MDHs or HMHs might be considered essential access facilities, alternate criteria should be developed to identify these facilities regardless of the proportion of their patients attributable to the Medicare program.

Background

Federal policymakers are increasingly concerned about financially distressed rural hospitals and potential access problems for rural residents should these hospitals close. The visibility of this issue has been enhanced by the increasing number of rural hospital closures. From 1980 through 1989, 232 rural hospitals closed (Adamache and Hurdle, 1991). Among those rural hospitals that remain open, several are reporting large operating deficits, leading to speculation that they will close during the next decade.

Medicare payment policy has been used to target assistance to rural hospitals. For the period 1984-91, Congress enacted numerous changes to PPS to improve the financial performance of rural hospitals. As a result, additional per case payments are made to particular types of rural hospitals assumed to have systematically higher treatment costs or to represent access problems should they close. A recent report by the Prospective Payment Assessment Commission (ProPAC) found that the only groups of rural hospitals with positive PPS margins were those benefiting from targeted subsidies (Prospective Payment Assessment Commission, 1991). Consequently, appropriate targeting criteria may be critical in determining which rural hospitals remain open and which close. Ideally, Medicare payment policy would help to assure that the closures occur in a pattern that minimizes access problems for Medicare beneficiaries.

Representatives of hospitals, both urban and rural, with a high proportion of Medicare patients have repeatedly expressed concern that they are at a disadvantage relative to other hospitals under PPS for two reasons. First, because a high proportion of their revenue is derived from the Medicare program, discrepancies between Medicare costs and payments have a greater effect on their overall financial status.

Second, they have a smaller proportion of non-Medicare patients to make up for any shortfalls in Medicare payments.

As a result of these concerns, (Public Law 101-239) the Omnibus Budget Reconciliation Act of 1989 (OBRA 1989) provided special payments to Medicare-dependent, small rural hospitals for reporting periods ending on or before March 31, 1993. To qualify as a MDH, a hospital must be located in a rural area, have 100 or fewer beds, not be classified as a sole community hospital (SCH), and have had at least 60 percent of its inpatient days or discharges attributable to Medicare beneficiaries. Currently, 541 rural hospitals have applied and received designation as an MDH.

Under the special payment provisions, hospitals that qualify receive the greater of: hospital-specific rate based on 1982 costs trended forward, hospital-specific rate based on 1987 costs trended forward, or PPS Federal payment rate. According to simulations generated by the Health Care Financing Administration (HCFA) for establishing the fiscal year (FY) 1993 PPS Federal payment rates, 1991 Medicare payments to approximately 57 percent of the MDHs were based upon one of the two hospital-specific rates (*Federal Register*, 1992). For those receiving a hospital-specific amount, the U.S. Congressional Budget Office (CBO) has estimated that the average payment is about 17 percent higher than they would receive if they were not designated as an MDH. For those receiving the Federal payment rate, their payments are the same as they would receive if they were not designated as an MDH. Across all designated MDHs, the special payment provisions increase their payment by an average of 8 percent (U.S. Congressional Budget Office, 1991).

Congress focused only on the financial problems of small, rural hospitals in creating the special MDH designation. Congress did, however, request that ProPAC study the appropriateness of adjusting payments to both urban and rural HMHs. ProPAC identified HMHs as those facilities which have over 65 percent of their 1988 inpatient days attributable to Medicare beneficiaries. Their study found that these

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hospitals tend to perform badly financially under PPS but that characteristics other than Medicare share are related to their poor performance. When the effects of such characteristics as low occupancy rates and long average length of stay are accounted for, hospitals with high Medicare share were found to perform as well as other hospitals under PPS (Guterman et al., 1990). ProPAC recommended that no payment adjustment be made to hospitals with a large share of Medicare patients (Prospective Payment Assessment Commission, 1990).

Because the MDH designation will expire on March 31, 1993, the issue of whether subsidies to these facilities can be justified remains. In addition, representatives of hospitals with a high proportion of Medicare payments continue to advocate the inclusion of all high Medicare hospitals in the special designation. While previous research suggests that a subsidy may not be justifiable on the basis that either of these groups of hospitals has higher treatment costs, the issue of whether these facilities may provide essential access to inpatient care for Medicare beneficiaries has not been addressed.

Analytical framework

The purpose of this research is to determine whether either the current MDH or alternative HMH targeting criterion identifies hospitals whose closure might impair access to care for Medicare beneficiaries residing in their service areas. This assessment is made by examining three principal factors: current utilization patterns, the availability of alternate facilities, and the socioeconomic and demographic characteristics of the service area. These three factors can be viewed in terms of the traditional framework developed by Aday and Andersen (1975) for analyzing access to health care services: realized access, potential access, and predisposing and enabling factors.

First, current utilization patterns based upon patient flows from residence to hospital can be used to describe realized access to hospital care (Aday and Andersen, 1975). If a community is currently dependent upon an individual hospital for services, that hospital would serve a large proportion of community residents and have a high market share. In addition, very few patients residing in the hospital's market area would seek services from alternate facilities (Goody, 1992b). If a hospital is, in essence, the sole provider of hospital care for a community, its closure might endanger current levels of access to hospital care.

Second, the proximity of neighboring facilities can be used to describe potential access. Structural characteristics of the delivery system identify potential sources of patient care (Aday and Andersen, 1975). Even if neighboring hospitals may not currently serve patients in the market area, their physical proximity suggests that, in the event of closure, patients would be able to travel to them for inpatient care. On the other hand, if a hospital is geographically isolated from other hospitals, its patients may have difficulty getting to another hospital if it closes.

Third, the socioeconomic and demographic characteristics of the service areas can be used to describe predisposing and enabling factors in the population at risk. Predisposing factors describe an individual's propensity to use services. Enabling factors describe the means that individuals have to purchase services (Aday and Andersen, 1975). Needy markets can be defined in terms of a population with a greater propensity to use services (i.e., a high proportion of frail or disabled Medicare beneficiaries) or with fewer resources to purchase care (i.e., low household income or high rates of unemployment). Some hospitals may deserve subsidies under PPS because they serve needy markets and their closure might impair access to care for beneficiaries who reside in areas with substantial low-income and other vulnerable populations (Goody, 1991). Not only are these populations less able to seek and obtain treatment at facilities outside their community, but their local governments are less likely to have sufficient resources to support the hospital.

Research questions

To evaluate the appropriateness of the current MDH and alternative HMH designations, five research questions are posed:

- What are the patient care characteristics of MDHs and HMHs?
- What are the financial conditions of MDHs and HMHs?
- Do these hospitals serve as the sole provider of care for Medicare patients residing in their service area?
- Are alternative sources of inpatient care available to patients of these hospitals?
- What are the socioeconomic and demographic characteristics of the hospitals' market areas?

The answers to the first two questions will provide a broad-based description of these facilities. The last three questions specifically address the three dimensions of access.

Data sources

Two files from HCFA were used for the analysis: the Medicare Provider Analysis and Review File (MEDPAR) for calendar year 1988 and the Hospital Cost Reporting Information System (HCRIS) for FYs 1985 through 1988. The MEDPAR file, which contains information about a beneficiary's stay in a hospital from admission to discharge, was used to build patient origin files containing aggregate counts of discharges by ZIP Code of beneficiary residence for each hospital. HCRIS is the national data base for Medicare Hospital Cost Report data containing specific financial and statistical data from Medicare-certified hospitals. Finally, 1987 socioeconomic and demographic data at the five-digit ZIP Code level were obtained from a file compiled from a variety of sources including the Current Population Survey (U.S. Bureau of Labor Statistics, 1987) and the 1980 U.S. Census of Population and Housing (U.S. Bureau of the Census, 1980).

Variables

Market area

In order to answer the research questions related to access, it is first necessary to define the market. This involves two choices—the choice of the relevant product and the choice of the appropriate market. For purposes of this research, the relevant product is defined as acute inpatient care. The geographic market is defined using a two-stage procedure. During the first stage, a primary service area (i.e., the area in which the hospital sells most of its product) was defined. Patient origin information was used to determine where hospitals get their patients. The baseline area was defined as those ZIP Codes (rank ordered in numerical importance) that contribute at least 75 percent of a hospital's 1988 Medicare discharges. During the second stage, patient origin information was used to determine where patients went to get care. If a hospital was the majority provider (a market share of 50 percent or more) in an area, the ZIP Code was added to the baseline catchment area. While these ZIP Codes may not provide the hospital with a large volume of discharges, they are dependent upon the hospital for inpatient care (Goody, 1992a).

Realized access

Current utilization patterns based upon 1988 Medicare discharges were used to calculate a hospital's market share and to identify competitors—other hospitals that currently serve residents of the market area. First, market share is the proportion of total demand in a geographic market going to an individual hospital. The operational definition used in this research is the proportion of 1988 total Medicare discharges in the market area that are from an individual hospital. Second, if two hospitals had overlapping market areas, they were identified as competitors of one another. For example, hospital X has three ZIP Codes in its market area and hospital Y has five ZIP Codes in its market area. If one or more ZIP Codes are in the market area of both hospitals, then X is a competitor of Y and vice versa.

Potential access

The latitude and longitude of the location of hospitals were used to identify near neighbors—all other hospitals located within a 15-mile radius of each hospital. These near neighbors represent potential sources of hospital care for residents of the market area.

Predisposing and enabling characteristics

To describe market area characteristics, socioeconomic and demographic data of residents were aggregated from the ZIP Code level to the market level. Where necessary, the proportion of a hospital's patients that were contributed by the ZIP Code was the weighting factor. Characteristics that are examined

include socioeconomic characteristics of the general population (average household income and percent employed) and the characteristics of Medicare beneficiaries (percent disabled, percent 85 years of age, and percent eligible for Medicaid buy-in). Unfortunately, a socioeconomic profile of the hospital's Medicare patients is not contained in the data bases used in this study.

Universe of hospitals

In order to answer the research questions for the two categories of hospitals, two different universes of hospitals were defined. The universe for the analysis of MDHs is defined by the qualification criteria specified in OBRA 1989. The universe for the analysis of HMHs is defined by the previous analyses by ProPAC and HCFA (Guterman et al., 1991; *Federal Register*, 1992). Neither group of hospitals is a subset of the other. There are 215 hospitals that are targeted by both the HMH and MDH criteria.

The first phase of the analysis, focusing on MDHs, was limited to 1,538 short-term, acute-care rural hospitals with 100 or fewer beds that are not designated as SCHs and are located in non-waivered States (all States except Maryland and Puerto Rico). As of July 1991, 529 of these facilities were designated as MDHs. Rural hospitals designated as SCHs and larger rural hospitals were excluded from the comparison group because they are not eligible for the current designation.

For the second phase of the analysis, focusing on HMHs, a broader universe was considered. Utilization information from 2 fiscal years (1988 and 1989) was used to identify hospitals in non-waivered States with more than 65 percent of their inpatient days attributable to Medicare beneficiaries in both years. As a result, the universe of hospitals was limited to 4,928 facilities with complete and reliable Medicare Cost Report data for both years. Two years of data were used because many hospitals that have a high Medicare patient load in one year do not sustain that level in the subsequent year. Of the 576 hospitals with more than 65 percent of their 1988 inpatient days attributable to the Medicare beneficiaries, only 455 (79.0 percent) continued that level of activity in 1989.

Urban and rural HMHs were analyzed separately for two reasons. First, previous analyses have demonstrated that the urban HMHs have very different characteristics from rural HMHs (Guterman et al., 1991). Pooling data from urban and rural hospitals may mask important differences between HMHs and other hospitals. Second, Medicare payment policies have traditionally discriminated based upon location in an urban or rural area. If one group of hospitals was identified as providing essential access to inpatient care for Medicare beneficiaries and the other group was not, there would be precedents for establishing different Medicare payment policies. Of the 455 HMHs identified, the vast majority (328 hospitals) are located in rural areas.

Results

Each group of identified hospitals was examined separately. First, the patient care characteristics were examined to determine the types of care provided and the types of services offered. Next, the financial conditions were examined to see whether there was any evidence to suggest that PPS had a differential impact on these facilities. Finally, the characteristics of the hospitals' market areas were analyzed to see whether they were essential to the provision of inpatient care for Medicare beneficiaries residing in their service area.

Characteristics of Medicare dependent hospitals

Patient care and financial conditions

The patient care characteristics of MDHs were compared with other non-designated rural hospitals with 100 or fewer beds to determine whether they are treating less complex cases and offering a limited scope of services. As is shown in Table 1, even within this group of smaller rural hospitals, MDHs have significantly fewer beds and total discharges. MDHs appear to treat less complex cases with a lower case-mix index and percentage of surgical cases. The hypothesis that these facilities are providing less complex care is also supported by the availability of intensive care

services and diagnostic and therapeutic technologies. A lower proportion of MDHs offer medical and surgical intensive care services and some of the newer and more sophisticated diagnostic and therapeutic technologies. Finally, while MDHs have, by definition, a high proportion of their inpatient days attributable to Medicare beneficiaries, they have a significantly lower proportion of their inpatient days attributable to Medicaid recipients.

The financial conditions of MDHs were analyzed to determine whether they are financially vulnerable facilities. As is shown in Table 2, the current financial status of MDHs is comparable in many respects to other small rural hospitals. Even before the MDH provisions of OBRA 1989 were implemented, MDHs did not appear to be disadvantaged by Medicare payment policies. Despite lower operating revenue per discharge, there is no significant difference in their 1988 Medicare operating margins. These similarities disappear when examining their overall financial condition. Total margins are higher than Medicare margins for both groups. However, the significantly lower total margins for MDHs implies that MDHs are less successful than other rural hospitals in generating revenue from other sources to make up for shortfalls in revenue from Medicare patients. In addition, MDHs have significantly lower occupancy rates than other small, rural hospitals. This combination of low total margins

Table 1

Rural Medicare dependent hospitals (MDHs), by characteristics: 1988

Characteristic	MDHs	Others
Medicare inpatient		
Bed size	41.4	***51.8
Total discharges	453.4	***556.0
Case-mix index (CMI)	1.039	**1.050
Percent surgical discharges	29.4	***33.0
Average length of stay ¹	5.8	5.8
Charge per discharge ¹	\$3,022.3	***\$3,387.3
Percent Medicaid days	6.8	***10.6
N	527	980
Intensive care capability and availability of selected services		
Intensive care capability:		
Medical and surgical	43.0	***55.6
Cardiac care	5.8	4.8
Selected technologies:		
Computerized tomography scanner	21.5	***36.8
Ultrasound	58.4	***72.5
Diagnostic radiology	22.1	***32.0
Radiation therapy	1.8	*3.4
Hemodialysis	1.8	**3.5
Cardiac catheterization lab	.2	.7
N	498	913

*Statistically significant at the $p < .10$ level.

**Statistically significant at the $p < .05$ level.

***Statistically significant at the $p < .01$ level.

¹These figures are CMI-adjusted.

SOURCES: Health Care Financing Administration, Office of Research and Demonstrations: Based on data from the Medicare Provider Analysis and Review File; and the American Hospital Association, Annual Survey Tapes.

Table 2

Financial conditions and trends in margin of rural Medicare dependent hospitals (MDHs): 1988

Characteristic	MDHs	Others
Financial condition		
Operating cost per discharge ¹	\$2,392.4	\$2,432.4
Operating revenue per discharge ¹	\$2,259.1	*\$2,320.1
Medicare operating margins	-3.9	-2.6
Total margins	-1.1	***.9
Occupancy rate	28.0	***34.7
N	507	937
Trends in margins		
Medicare:		
PPS2	3.9	4.6
PPS3	-3.9	***-.7
PPS4	-5.4	*-3.3
PPS5	-3.9	-2.6
Total:		
PPS2	2.3	2.7
PPS3	-2.0	***.0
PPS4	-1.7	*-.2
PPS5	-1.1	***.9

*Statistically significant at the $p < .10$ level.

**Statistically significant at the $p < .05$ level.

***Statistically significant at the $p < .01$ level.

¹These figures are CMI-adjusted.

NOTES: PPS is prospective payment system. CMI is case-mix index. PPS2, PPS3, PPS4, and PPS5 represent the second, third, fourth, and fifth years of PPS.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Based on data from the Hospital Cost Reporting Information System.

and low occupancy rates suggests that MDHs are financially vulnerable and at increased risk of closure.

Historical trends, also presented in Table 2, show that total margins for MDHs fell sharply between the second and third years of PPS. Once again, these low total margins appear to be a reflection of low Medicare operating margins. While there was no significant difference in total margins between MDHs and non-MDHs at the beginning of PPS, MDHs did have significantly lower total margins by the third year of PPS. Other small, rural hospitals have also suffered from a large decline in their total margins, but a larger proportion of non-Medicare inpatient revenue appears to make this decline less precipitous.

Service areas

Service area characteristics were examined to determine whether MDHs provide essential access to Medicare beneficiaries residing in their service area. The results are presented in Table 3. Utilization patterns show that MDHs have a slightly higher level of local market penetration as measured by market share than other rural hospitals. This is true whether one considers all Medicare discharges or the more basic medical (non-surgical) discharges. In addition, MDHs have significantly fewer competitors operating in their

service area, and a smaller proportion of MDHs have any competitors currently serving patients residing in their service area. Nonetheless, as a group, MDHs are difficult to characterize as the sole providers of hospital care in their service areas. On average, over 60 percent of the Medicare patients residing in the service area of an MDH go elsewhere for hospital care.

Residents of the service areas of MDHs have the same potential access to hospital services as residents of the service areas of other rural hospitals. There is no significant difference in the availability of alternate facilities within a 15-mile radius. This should not, however, be interpreted as saying that access problems might not arise in the event of closure. Because less than 50 percent of both MDH and non-MDH hospitals have a neighbor within a 15-mile radius, this appears to be a broader access problem not specifically associated with currently designated facilities.

As shown in Table 3, some of the characteristics of the service areas of MDHs suggest that they serve needy communities while others suggest they do not. Indicators of neediness include a lower median household income and a higher proportion of elderly residents. Not only is a higher percentage of the general population over 65 years of age, but also a higher percentage of Medicare beneficiaries might be classified as frail elderly—over 85 years of age. Characteristics of service areas that do not suggest neediness include a lower unemployment rate, a lower percentage of black residents, and lower percentages of Medicare beneficiaries who are eligible for Medicaid coverage or who are disabled. In order to reconcile the apparent contradiction between a lower household income and a lower unemployment rate, these differences were re-examined controlling for the proportion of the general population over 65 years of age. While the service areas of MDHs continue to have a lower median household income, there is no significant difference in the unemployment rate standardized by the proportion of the population that is elderly.

As previously discussed, only 57 percent of MDHs actually benefit from their designation by receiving a hospital-specific payment. In a parallel analysis not presented in this article, the service area characteristics of the MDHs receiving the hospital-specific payment were compared with those of the MDHs receiving the Federal payment. The purpose of that analysis was to determine whether the hospitals that benefited from the MDH subsidy were more likely to provide essential access to inpatient services for Medicare beneficiaries than other MDHs. There were very few differences in the characteristics of the service areas of the two sets of MDHs. The MDH designation appears to financially benefit facilities with a lower market share and more competitors operating in their market area. In terms of utilization patterns, these MDHs are less likely to provide essential access. There were no differences between the two sets of MDHs in the number of near neighbors or in any of the socioeconomic and demographic characteristics of the service area.

Table 3

Rural Medicare dependent hospitals (MDHs), by service area characteristics: 1988

Characteristic	MDHs	Others
Hospital market		
Market share:		
Total discharges	39.6	*38.1
Medical discharges (non-surgical)	55.0	**52.1
Number of competitors	1.38	**1.61
Percent with competitor	61.1	***67.3
Number of near neighbors	.65	.73
Percent with near neighbor	43.9	47.1
<i>N</i>	528	985
General population		
Median household income	19,519	***20,647
Percent unemployed	6.1	***7.1
Percent black	6.0	**9.8
Percent over 65 years of age	18.6	***15.1
<i>N</i>	527	980
Beneficiary population		
Percent white	91.8	***88.1
Percent Medicaid-eligible	10.3	***12.3
Percent over 75 years of age	40.7	***37.4
Percent over 85 years of age	10.6	***9.4
Percent disabled	12.9	***15.2
<i>N</i>	528	985

*Statistically significant at the $p < .10$ level.

**Statistically significant at the $p < .05$ level.

***Statistically significant at the $p < .01$ level.

SOURCES: Health Care Financing Administration, Office of Research and Demonstrations: Based on data from the Medicare Provider Analysis and Review File and the Health Insurance Skeleton Eligibility Write-Off File.

Characteristics of high Medicare hospitals

Patient care and financial conditions

The patient care characteristics of rural HMMs suggest that they are treating less complex cases and offering a limited scope of services. As shown in Table 4, rural HMMs have significantly fewer beds and total discharges as well as a lower case-mix index and percentage of surgical cases, compared with other rural hospitals. In addition, a lower percentage of rural HMMs offer medical and surgical intensive care services and all categories of diagnostic and therapeutic technologies. Despite treating less complex cases, these facilities have a longer average length of stay. This suggests that they might be providing custodial care to Medicare beneficiaries in areas where post-acute care is not readily available. Finally, rural HMMs have a significantly lower proportion of their inpatient days attributable to Medicaid recipients than do other rural hospitals.

A similar but less consistent story emerges when looking at urban HMMs. For example, while urban HMMs have significantly fewer beds than other urban hospitals, they do not have significantly fewer total discharges. Urban HMMs also treat less complex cases with lower case mix and percentage of surgical cases. In general, these facilities are less likely to offer specialized diagnostic and treatment services. There are, however,

a few exceptions. There is no significant difference in the availability of medical and surgical intensive care, ultrasound, and diagnostic radiology services at urban HMMs. Like their rural counterparts, they may also be providing custodial care to Medicare beneficiaries. In addition, urban HMMs also have a significantly lower proportion of their inpatient days attributable to Medicaid recipients.

The overall financial characteristics of both urban and rural HMMs presented in Table 5 is comparable. In comparison with their non-HMM counterparts, HMMs have lower Medicare operating margins and lower occupancy rates. The lower Medicare margins appear to be attributable to lower operating revenue per discharge. In an analysis not presented here, the components of the operating revenue were disaggregated to determine which aspects of the PPS methodology caused this differential. Consistent with their patient care characteristics, both urban and rural HMMs receive smaller additional per-case payments for outlier cases and indirect teaching activity. In addition, HMMs receive lower disproportionate share adjustments for treating low-income patients.

For rural HMMs, there have been sizable and very significant differences from other rural hospitals in Medicare operating margins in all years since the implementation of PPS. Surprisingly, these differences have not consistently resulted in lower total margins.

Table 4
Rural and urban high Medicare hospitals (HMMs), by characteristic: 1988

Characteristic	Rural		Urban	
	HMMs	Others	HMMs	Others
Medicare inpatient				
Bed size	47.1	***77.2	157.4	***235.3
Total discharges	577.0	***896.7	2,527.3	2,658.8
Case-mix index (CMI)	1.044	***1.080	1.197	***1.251
Percent surgical discharges	30.8	***37.1	53.2	***61.9
Average length of stay ¹	5.9	**5.7	6.9	**6.6
Charge per discharge ¹	\$3,125.0	***\$3,553.6	\$5,550.8	*\$5,838.3
Percent Medicaid days	5.5	***9.8	4.0	***9.5
<i>N</i>	328	2,011	127	2,461
Intensive care capability and availability of selected services				
Intensive care capability:				
Medical and surgical	44.6	***65.4	89.3	90.6
Cardiac care	5.1	**8.3	25.7	**36.5
Selected technologies:				
Computerized tomography scanner	23.2	***47.8	75.2	**85.3
Ultrasound	60.5	***78.3	90.3	94.9
Diagnostic radiology	23.2	***44.4	76.1	82.4
Radiation therapy	4.8	***11.3	29.2	***49.6
Hemodialysis	3.8	**9.2	34.5	**44.4
Cardiac catheterization lab	2.2	*4.1	16.8	***43.1
Open heart	.3	***1.7	9.7	***28.4
<i>N</i>	314	914	113	2,280

* Statistically significant at the $p < .10$ level.

** Statistically significant at the $p < .05$ level.

*** Statistically significant at the $p < .01$ level.

¹These figures are CMI-adjusted.

SOURCES: Health Care Financing Administration, Office of Research and Demonstrations: Based on data from the Medicare Provider Analysis and Review File and the American Hospital Association, Annual Survey Tapes.

Table 5
Financial conditions and trends in margin of high Medicare hospitals (HMHs): 1988

Characteristic	Rural		Urban	
	HMHs	Others	HMHs	Others
Financial condition				
Operating cost per discharge ¹	\$2,480.7	\$2,529.7	\$3,496.5	\$3,620.1
Operating revenue per discharge ¹	\$2,283.0	***\$2,436.4	\$3,398.8	***\$3,742.3
Medicare operating margins	-7.7	*** -2.3	-1.8	***3.4
Total margins	.3	1.7	1.3	2.1
Occupancy rate	28.0	**37.3	53.6	**57.7
N	328	2,011	127	2,461
Trends in margins				
Medicare:				
PPS2	2.3	***6.0	11.1	12.7
PPS3	-5.7	***.3	6.4	8.8
PPS4	-7.3	*** -2.2	3.2	**5.9
PPS5	-7.7	*** -2.3	-1.8	***3.4
Total:				
PPS2	2.4	3.4	6.5	5.8
PPS3	-1.2	**1.2	4.1	3.6
PPS4	-.6	.9	2.5	2.9
PPS5	.3	1.7	1.3	2.1

*Statistically significant at the $p < .10$ level.

**Statistically significant at the $p < .05$ level.

***Statistically significant at the $p < .01$ level.

¹These figures are CMI-adjusted.

NOTES: PPS is prospective payment system. CMI is case-mix index. PPS2, PPS3, PPS4, and PPS5 represent the second, third, fourth, and fifth years of PPS.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Based on data from the Hospital Cost Reporting Information System.

For urban HMHs, the differences in Medicare operating margins have increased in magnitude and significance since the implementation of PPS. There are, however, no significant differences in total margins between these facilities and other urban hospitals. It would appear that these urban HMHs have been able to compensate for low Medicare margins, perhaps, by providing care in the outpatient setting.

Service areas

The characteristics of the service areas of HMHs are presented in Table 6. For rural HMHs, utilization patterns show no evidence that these facilities are more likely to serve as the sole provider of hospital care than other rural hospitals. There is no significant difference in local market penetration for rural HMHs, and almost 60 percent of the Medicare patients residing in their service area go elsewhere for hospital care. There are, however, significant differences in potential access to alternate facilities should a rural HMH close. Only 35 percent of rural HMHs have another hospital located within a 15-mile radius.

A somewhat different story emerges when analyzing the service areas of urban HMHs. These facilities have significantly higher local market penetration than other urban hospitals. The difference is greatest for the more basic medical discharges. There are, however, many alternative sources of hospital care available in urban areas. On average, more than 4 other hospitals currently serve the residents of their service areas, and more than 11 hospitals are available within a 15-mile radius. In the event of closure, patients of urban HMHs would face the same availability of alternate facilities as

other urban hospitals. In addition, they would also be able to choose from many different facilities, some of which already serve patients residing in the service area.

As was the case with MDHs, the socioeconomic and demographic characteristics of the service areas of both rural and urban HMHs present an inconsistent story. Once again, some characteristics suggest that they serve needy communities, while others do not. Indicators of neediness include a lower household income and a higher proportion of elderly residents. Characteristics of service areas which do not suggest neediness include a lower unemployment rate, a lower percentage of black residents, and a lower percentage of Medicare beneficiaries who are eligible for Medicaid coverage or who are disabled. Controlling for the proportion of the population that is elderly, there are no significant differences in the median household income of the service areas of urban HMHs and the unemployment rate in the service areas of both urban and rural HMHs.

Discussion

In creating the special designation for MDHs, Congress focused on policymakers' concerns for small, rural hospitals. The designation criteria identify a set of small facilities that treat less complex cases and offer fewer and less technologically intensive services. Presubsidy financial data suggest that these hospitals are financially vulnerable with negative Medicare and total margins and low occupancy rates.

Simulations generated by CBO found that, while the dollar value of these subsidies is relatively small (less than 1 percent of all PPS payments to rural hospitals),

Table 6
High Medicare hospitals (HMHs), by service area characteristics: 1988

Characteristic	Rural		Urban	
	HMHs	Others	HMHs	Others
Hospital market				
Market share:				
Total discharges	41.5	43.2	28.5	**25.0
Medical discharges (non-surgical)	56.8	56.4	35.7	***27.9
Number of competitors	1.38	***1.89	4.67	***7.00
Percent with competitor	61.9	67.5	85.0	89.1
Number of near neighbors	.51	***.67	11.81	12.78
Percent with near neighbor	35.1	**41.7	81.1	88.8
<i>N</i>	327	2,011	127	2,461
General population				
Median household income	\$19,278	***\$20,860	\$24,485	***\$26,995
Percent unemployed	6.1	***7.1	6.8	8.8
Percent black	4.2	***8.0	6.9	***12.0
Percent over 65 years of age	19.6	***14.9	19.8	***12.8
<i>N</i>	327	2,011	127	2,461
Beneficiary population				
Percent white	93.1	***88.9	90.3	***85.5
Percent Medicaid-eligible	9.4	***11.2	6.7	***9.5
Percent over 75 years of age	40.7	***37.3	37.3	***35.4
Percent over 85 years of age	10.5	***9.3	8.7	8.7
Percent disabled	12.5	***14.9	12.9	***15.2
<i>N</i>	327	2,011	127	2,461

*Statistically significant at the $p < .10$ level.

**Statistically significant at the $p < .05$ level.

***Statistically significant at the $p < .01$ level.

SOURCES: Health Care Financing Administration, Office of Research and Demonstrations: Based on data from the Medicare Provider Analysis and Review File and the Health Insurance Skeleton Eligibility Write-Off File.

they substantially improve the financial status of the targeted facilities. CBO simulations using 1991 payment rules estimate that the average Medicare operating margins of MDHs will increase to 10.5 percent with the subsidy. Because the Medicare program is such a large proportion of their revenue, CBO estimates that these subsidies will also improve the total margins to an average of 5.9 percent (U.S. Congressional Budget Office, 1991).

While these subsidies may be very successful in increasing the financial viability of MDHs, this analysis has shown that they are hard to justify on the basis that these facilities represent essential access hospitals. Neither actual utilization patterns nor structural characteristics of the delivery system provide evidence that MDHs are more important to beneficiary access to care than other small, rural hospitals.

Broadening the definition to include all hospitals—both urban and rural of any size—continues to identify a set of small facilities that treat less complex cases and offer fewer and less technologically intensive services. While these facilities may not have significantly lower total margins, their patient care characteristics and low occupancy rates suggest that, like MDHs, they are financially vulnerable. Measures of realized and potential access do not point to any specific access problems. Certainly, in urban areas, there appears to be a plethora of alternate facilities available to beneficiaries served by MDHs.

The socioeconomic characteristics of the service areas of MDHs and HMHs suggest one area of concern that deserves further analysis. Controlling for the proportion of population that is elderly, MDHs and rural HMHs have service areas with lower median household income than other rural hospitals. While the concern that these hospitals may serve financially vulnerable populations is mitigated by the fact that a significantly lower proportion of their inpatient days are attributable to the Medicaid program, it would be helpful to understand more about the socioeconomic characteristics of the Medicare patients served at these hospitals. The prospect that these facilities may serve lower income Medicare beneficiaries should be investigated. Unfortunately, these data are not readily available because files maintained by the Medicare program do not contain the socioeconomic characteristics of beneficiaries.

While it may be the case that some individual MDHs and HMHs could be considered essential access facilities, alternate criteria should be developed to identify these facilities regardless of the proportion of their patients attributable to the Medicare program. This may be especially important in rural areas where the geographic distribution of hospitals may limit the availability of alternative hospital facilities. MDHs and HMHs undoubtedly depend upon the Medicare program for their financial well-being, but it does not appear that the Medicare program depends on these facilities to maintain access to care for its beneficiaries.

References

Adamache, K.W., and Hurdle, S.: *Medicare PPS and Hospital Closures, 1980-1988*. Working paper prepared for the Health Care Financing Administration. Health Economics Research, Needham, MA. June 1991.

Aday, L.A., and Andersen, R.: *Access to Medical Care*. Ann Arbor, MI. Health Administration Press, 1975.

Federal Register: Changes to Hospital Inpatient Prospective Payment Systems and Fiscal Year 1993 Rates. Final Rule. Vol. 57, No. 170, 39818-39824. Office of the Federal Register, National Archives and Records Administration, Washington. U.S. Government Printing Office, Sept. 1, 1992.

Goody, B.: *Preserving Access to Hospital Care in Poor Rural Areas*. Working Paper. Office of Research and Demonstrations, Health Care Financing Administration. Baltimore, MD. Nov. 1991.

Goody, B.: *Defining Rural Hospital Markets*. Working Paper. Office of Research and Demonstrations. Health Care Financing Administration. Baltimore, MD. Aug. 1992a.

Goody, B.: *Sole Providers of Hospital Care in Rural Areas*. Working Paper. Office of Research and Demonstrations, Health Care Financing Administration. Baltimore, MD. Aug. 1992b.

Guterman, S., Carter, C., Garcia, D.D., and Pettengill, J.: *Medicare Dependent Hospitals Under PPS*. Technical Report I-90-01. Prospective Payment Assessment Commission. Washington. June 1991.

Prospective Payment Assessment Commission: *Medicare Prospective Payment and the American Health Care System*: Report to Congress. Washington. U.S. Government Printing Office, June 1990.

Prospective Payment Assessment Commission: *Rural Hospitals Under Medicare's Prospective Payment System*. Congressional Report C-91-03. Washington. U.S. Government Printing Office, Oct. 1991.

U.S. Bureau of the Census: *Census of Population and Housing*. Unpublished. Washington, DC. 1980.

U.S. Bureau of Labor Statistics: *Current Population Survey*. Unpublished. U.S. Department of Labor. Washington, DC. 1987.

U.S. Congressional Budget Office: *Rural Hospitals and Medicare's Prospective Payment System*. Washington. Congress of the United States, Dec. 1991.