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Trends in Supply and Utilization of Rural Hospitals with Special Medicare Payments

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DRU-2475-HCFA

December 2000

Prepared for HCFA

Health

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PREFACE

The Health Care Financing Administration (HCFA) contracted with RAND to perform an analysis of Medicare special payments to rural providers and implications for access and costs of care for rural Medicare beneficiaries, with a focus on underserved areas. The payment provisions examined include (1) bonus payments to physicians in rural HPSAs; (2) reimbursements to rural health clinics and federally qualified health centers; (3) special payments for sole community hospitals, Medicare-dependent hospitals, rural referral centers, EACH/RPCH hospital networks, and Medical Assistance Facilities; and (4) capitation payments in rural counties.

This report presents the findings of our analysis of rural hospitals, including the numbers and distributions of rural hospitals and trends in inpatient utilization and spending for rural hospital services. Section 1 provides background on rural issues and Medicare payment methods, and Section 2 describes our analytic methods. In Section 3, we examine the supply of Medicare-certified hospitals in non-metropolitan areas from 1992 through 1998. In Section 4, similar trend information is given by categories of hospitals paid under one of the Medicare special payment provisions. Sections 5 and 6 present trends in hospital inpatient utilization and spending for Medicare beneficiaries from two distinct perspectives: a hospital-based analysis for non-metropolitan hospitals (Section 5), and a beneficiary-based analysis for beneficiaries residing in non-metropolitan counties (Section 6).

This draft report is one of four reports being prepared from our analyses of Medicare special payment policies for rural providers. The other reports address trends during the 1990s in AAPCC rates, bonus payments for rural physicians, and payments for rural health clinics and Federally Qualified Health Centers.

The work presented in this report was performed under Task 11 of Health Care Financing Administration Contract Number HCFA-500-96-0056, Project Officer William Buczko.

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SUMMARY

The Health Care Financing Administration (HCFA) contracted with RAND to perform an analysis of Medicare spending for special payments to rural providers and their implications for access and costs of care for rural Medicare beneficiaries. Our goal was to provide a comprehensive overview of utilization and spending for these services over the last decade. Information from these trend analyses will guide our examination of future Medicare rural payment policy options. The special payment provisions examined include (1) bonus payments to physicians in rural HPSAs; (2) reimbursements to rural health clinics and federally qualified health centers; (3) special payments for sole community hospitals, Medicare-dependent hospitals, rural referral centers, EACH/RPCH hospital networks, and Medical Assistance Facilities; and (4) capitation payments in rural counties, especially in underserved areas.

This report presents the preliminary findings from our analysis of rural hospitals and inpatient utilization by rural Medicare beneficiaries. We examined the numbers and distributions of rural hospitals, looking specifically at hospitals that qualify for Medicare special payments. We also considered trends in inpatient utilization and spending for rural hospital services.

BACKGROUND

Rural communities face challenges in ensuring access to care by protecting the stability of the institutional providers that historically have served their residents. Rural hospitals tend to be small and offer a limited range of services compared to their counterparts in more densely populated regions. In 1996, 72 percent of hospitals outside of Metropolitan Statistical Areas (MSAs) had 100 or fewer beds and 47 percent had fewer than 50 beds. Rural hospitals of this size provide proportionately more outpatient and long-term care services, compared to urban hospitals, and these services have had growing shares of total hospital services during the 1990s.

The Medicare Prospective Payment System (PPS), enacted in the early 1980s, was designed to create efficiency incentives while compensating hospitals for reasonable costs of care for Medicare beneficiaries, using average payments based on Diagnosis-Related Groups. Rural hospitals performed poorly under PPS, relative to urban hospitals, raising concerns about the

adequacy of rural payments. These problems were traced to three main factors: (1) declining patient volume that reduced revenues; (2) lower rural standardized amounts on which PPS payments are based, and (3) low patient volume that increased the relative share of fixed costs.

Congress created several new categories of rural hospitals with more favorable payment provisions to improve financial performance. Sole community hospitals were designated early in the 1980s using criteria to ensure access for Medicare beneficiaries residing in non-metropolitan counties. Rural referral centers are larger rural hospitals that receive patients from other hospitals. Small rural Medicare-dependent hospitals were designated from April 1990 through March 1993, and they were reactivated in 1997 by the BBA. Two demonstrations also were in operation during the 1990s to test alternative models for limited-service rural hospitals that refer to larger, full-service facilities. These were the Montana Medical Assistance Facility demonstration and the Essential Access Community Hospital (EACH) program. By 1997, EACH networks were operating in 6 states with a total of 38 rural primary care hospitals (RPCH) (GAO, 1998).

Each special payment designation responded to a unique set of issues for rural hospitals, with the result that both their eligibility criteria and payment methodologies differ substantially. Two other provisions also increase payments for rural hospitals: reclassifying hospitals so an urban wage index is used to establish PPS payments, and higher disproportionate share payments for certain rural hospitals. These provisions are summarized in Section 1 of this report. Of the 2,173 Medicare-certified, non-metropolitan hospitals existing in the year 2000, only 39.1 percent did not have a special designation, indicating how important Medicare special payment provisions are for these hospitals.

More recently, the Balanced Budget Act of 1997 (BBA, Public Law 105-33) and the Balanced Budget Refinement Act of 1999 (BBRA, Public Law 106-113) contained a number of provisions with implications for the financing and delivery of Medicare-funded services in rural areas. Provisions addressed fee-for-service payments for rural hospitals, skilled nursing facilities, home health agencies, and ambulance services, which are likely to have complex effects for rural hospitals and other providers. They also included reinstatement of Medicare

dependent hospitals, conversion of the EACH/RPCH program to the Rural Hospital Flexibility Program, and several adjustments to payments for rural hospitals with special designations.

For many rural programs and payments, eligibility requires providers to operate in underserved areas that were established by Congress and are designated by the Health Resources and Services Administration (HRSA) through its regulatory process. These areas are Medically Underserved Areas/Populations (MUA/P) and Health Professional Shortage Areas (HPSAs). HRSA re-examines and modifies HPSA designations at least every three years, as required by federal law. HRSA also has added new MUA/P designations periodically through the 1990s, but no existing MUA designations have been deleted.

RESEARCH QUESTIONS

The analyses presented in this report describe trends during the 1990s in the distribution, characteristics, utilization, and spending for services of all non-metropolitan hospitals, hospitals with Medicare special designations, and beneficiaries residing in non-metropolitan counties. The analyses were designed to address the following basic questions:

- How has the supply of Medicare-certified hospitals in rural areas, and the mix of services they offer, changed during the decade of the 1990s?
- How have service volumes and payments for Medicare inpatient services in rural hospitals changed during this time period?
- What are the trends in the levels and mix of service activity for Medicare beneficiaries and associated spending for sole community hospitals, rural referral centers, Medicare dependent hospitals, and EACH/RPCH hospitals?

ANALYSIS PLAN AND DATA

To examine 1992-1998 trends in the supply of rural hospitals and utilization of inpatient services, we used a combination of facility-level data on rural hospitals and Medpar data on inpatient utilization and spending. We identified all Medicare-certified, short-term hospitals located in non-metropolitan counties, and we classified them according to county location, as well as by special status under Medicare payment policies. We then analyzed Medicare hospital

inpatient utilization and expenditures, using Medpar claims for the 100 percent beneficiary sample, taking two distinct approaches. First, we analyzed trends in utilization and Medicare spending for *services by rural hospitals*, by type of special payment status and by hospital location. Second, we analyzed trends in utilization and spending on hospital inpatient services *for Medicare beneficiaries* residing in rural areas, by beneficiary location.

Using the county as the unit of measure, we defined several measures to characterize the locations of rural hospitals or beneficiaries. All counties located outside of a Metropolitan Statistical Area (MSA) were defined as "non-metropolitan" counties and were included in the analyses. For analyses of rural hospitals, we included all hospitals in non-metropolitan counties, and for analyses of utilization and spending for rural beneficiaries, we included inpatient claims for beneficiaries residing in these counties. The non-metropolitan counties were classified into five categories based on levels of the Urban Influence Codes reported in the Area Resource File. Frontier counties were defined as those in the western part of the country that had population densities of 6 or less population per square mile. Finally, we worked with county-level designations for HPSAs and MUAs, identified as either whole- or partial-county designations.

Data Sources

This analyses involved linking data from several sources, which enabled us to bring together data on the numbers and characteristics of hospitals serving non-metropolitan areas, their locations by degree of rurality, the numbers of Medicare beneficiaries in these areas, and their utilization of hospital inpatient services. The data files used included (1) annual Medicare Provider of Service (POS) files for 1992 through 1998, (2) Annual Provider Specific Files for 1992 through 1998, (3) an extract of the Area Resource File (ARF extract) with county-level information, (4) county-level summary files containing counts of Medicare beneficiaries, (5) Medpar claims for short-term inpatient hospital services for the 100 percent sample of Medicare beneficiaries for 1992 through 1998, (6) Files of Medicare DRG code numbers, names, and weights.

Defining the Study Populations

Two populations were of interest for this analysis: the set of hospitals located in non-metropolitan counties (the local supply of hospital inpatient services), and the Medicare beneficiaries residing in these counties (users of inpatient services).

Non-Metropolitan Hospitals. The hospitals included in the analyses were all non-metropolitan, short-term hospitals that were certified by Medicare. We retained hospitals that were Medicare-certified at least part of each year by keeping hospitals that (1) were in the Provider Specific File, which indicated they were being paid by Medicare according to rules of the Prospective Payment System, and (2) had current Medicare certification during the year, as defined by either not having a termination date or having a termination date later than January 5.

Beneficiaries Using Inpatient Services. The Medpar claims for the 100 percent sample identify the Medicare beneficiaries who use hospital inpatient services each year. From these files, we extracted all claims for beneficiaries with counties of residence in the non-metropolitan counties. In addition, we used HCFA files with counts of all beneficiaries residing in each county to establish county-level data on the total beneficiary population for the analysis.

SUMMARY OF FINDINGS

Trends in Hospital Supply

Closure of Rural Hospitals. From early in the decade of the 1990's, there was a gradual decline in the numbers of Medicare-certified hospitals serving non-metropolitan counties. The declining trends varied, however, across geographic areas:

- By region, reductions in non-metropolitan hospitals were greatest in the New York HHS region, and the Kansas City and Denver regions also had larger losses than other regions.
- The most remote rural counties, as well as in frontier counties, also had the greatest losses.
- There was an increase in the number of non-metropolitan counties that had no hospitals, and a decrease in the numbers of hospitals in counties with more than one hospital.

Geographic Access. A chronic issue for beneficiaries living in the more remote areas of the country has been geographic access to hospital services. The most sparse supplies of non-metropolitan hospital services were in the most remote counties, whether measured as certified beds per 1,000 population or certified beds per square mile. Yet frontier counties appeared to fare better, having bed ratios similar to more urbanized counties. The richest supplies were in counties with a city of at least 10,000 population, especially counties adjacent to MSAs.

Viability of Remaining Hospitals. Despite the declining supply of hospitals, those that continued to serve non-metropolitan areas showed encouraging signs of viability:

- Increased staffing levels over time suggest that hospitals were operating at higher levels of census than they were in the earlier years of the decade.
- Growing numbers of hospitals offered home care and hospice services, and had organized psychiatric inpatient units, which should enhance access to care for Medicare beneficiaries.

Ownership. The mix of hospital ownership shifted as the number of hospitals declined:

- Growing percentages of the non-metropolitan hospitals were owned by independent hospital districts or authorities, while ownership by local municipal governments decreased.
- The percentage of hospitals that were for-profit ownership increased in some categories of non-metropolitan counties but decreased in others, with a net effect across all non-metropolitan counties of little overall change in for-profit ownership.

Hospitals with Special Designations. There were changes in the mix of hospitals that were designated for Medicare special payment provisions or were reclassified for wage indexes for higher payments, but it is not obvious what factors contributed to these decreases. The overall percentage of non-metropolitan hospitals with special payment designations decreased from 54.8 percent in 1992 to 38.2 percent in 1998, with a subsequent increase to 60.9 percent in 2000 as BBA provisions went into effect:

- Most of the overall reduction in special designations was due to discontinuation of Medicare dependent hospitals after 1993; numbers increased when the designation was re-activated.
- The number of sole community hospitals increased somewhat; the number of rural referral centers decreased through 1998 and then increased by 2000.
- The percentage of hospitals reclassified for wage index declined from 25.8 percent in 1992 to 12.7 percent in 1998.

Hospitals designated as rural referral centers were much larger, on average, than other non-metropolitan hospitals, and they provided a greater diversity of services. The rural referral centers also were much more likely than the sole community hospitals to elect wage index reclassification.

Medicare Inpatient Utilization and Spending

We looked at changes in utilization and spending from two perspectives: inpatient services provided by non-metropolitan hospitals, and inpatient services utilized by beneficiaries residing in non-metropolitan counties regardless of hospital location.

Non-Metropolitan Hospitals. From 1992 to 1998, the total number of Medicare inpatient stays served by non-metropolitan hospitals increased by 12 percent, even as the number of hospitals declined. Differing trends were found by type of hospital designation:

- The percentages of total inpatient stays increased over time for sole community hospitals and for hospitals with no special payment designation, while percentages decreased for rural referral centers.
- In general, sole community hospitals had the largest shares of the Medicare inpatient stays provided by hospitals located in the more remote counties, whereas rural referral centers had the largest shares of stays among hospitals in counties with a city of 10,000 population or greater (either adjacent to an MSA or remote).
- Rural referral centers had much higher case mixes than other hospitals, as reflected in the average DRG weights for inpatient stays at these hospitals.

These differences in utilization of different types of non-metropolitan hospitals are reflected in the average spending for their inpatient stays. The average Medicare payment per stay for rural referral centers was higher than payments for other types of hospitals. When the payments per stay are standardized to payments for a DRG equal to 1.0, the average payments for rural referral centers and sole community hospitals become more similar. Average standardized payments for all groups of hospitals with special payment designations remained higher than those for other hospitals, reflecting the higher payments provided under these designations.

Non-Metropolitan Beneficiaries. Throughout the decade, urban hospitals have been an important source of inpatient services for rural Medicare beneficiaries. Urban hospitals represented 31 percent of inpatient stays for these beneficiaries and more than 45 percent of total Medicare spending on their inpatient care. The average payment per stay provided by urban hospitals was much greater than payments for stays at non-metropolitan hospitals, reflecting a combination of a higher acuity case mix and higher payment rates for urban facilities.

Beneficiaries residing in the more remote counties tended to have *higher utilization rates* than those in more urbanized non-metropolitan counties, despite the generally longer distances to hospital locations. The *average Medicare payment per inpatient stay*, however, tended to be lower for beneficiaries in remote counties.

Utilization and spending patterns for beneficiaries in frontier counties contrast sharply with those for other remote counties. Beneficiaries in frontier counties had the lowest rates of inpatient utilization per 1,000 beneficiaries, yet the average Medicare spending per inpatient stay was higher than for any of the other remote counties.

Inpatient Services in Under-Served Areas

The most visible differences we found in our analyses for non-metropolitan MUAs and HPSAs were between counties that are whole-county shortage areas (either MUA or HPSA) and other counties. Beneficiaries living in whole-county MUAs utilized inpatient services at higher rates than those in other counties; a similar but weaker difference was found for whole-county HPSAs. Compared with other counties, the average Medicare payment per inpatient stay tended

to be lower for beneficiaries in whole-county MUAs but higher for beneficiaries in whole-county HPSAs.

DISCUSSION

The findings of these descriptive analyses offer some evidence of stability in the supply of Medicare-certified hospitals during most of the 1990s. The hospitals with Medicare special payment designations appeared to play important roles in the delivery of services to beneficiaries in non-metropolitan counties. An underlying policy issue, however, is the extent to which the special payments to these hospitals have contributed to their financial viability and retention as operating institutions. Estimates of the portions of payments attributable to the special payment provisions could shed some light on this issue.

Another general issue highlighted is that of relationships between geographic access to hospital inpatient care, beneficiary health status, and observed utilization of inpatient services. Clearly, beneficiaries residing in the most remote rural counties have to travel longer distances to hospitals, and access to specialty hospital care may be even more difficult. This issue argues for ensuring that rural referral centers remain available in rural areas. We found that beneficiaries in remote locations and in shortage areas (MUAs and HPSAs) had higher rates of inpatient utilization than other rural beneficiaries. This utilization might include some hospital stays or re-hospitalizations that could have been avoided if they had better access to outpatient services. We plan to explore these and other related issues in subsequent analyses of access issues using survey and cost data from the Medicare Current Beneficiary Survey.

Section 1.

INTRODUCTION

The Health Care Financing Administration (HCFA) has contracted with RAND to perform an analysis of Medicare special payments to rural providers and their implications for access and costs of care for rural Medicare beneficiaries. Our goal is to provide a comprehensive overview of Medicare special payments to rural providers over the last decade, through which we will (1) estimate the relative contribution of these special payments to the Medicare capitation rates in rural counties, and (2) help identify and assess alternative approaches to assuring access. One focus of the study is on services in geographic areas designated by the Health Resources and Services Administration (HRSA) as either Health Professional Shortage Areas (HPSAs) or Medically Underserved Areas (MUA/Ps).

During the first phase of the project, we have analyzed historical trends in payments under several Medicare special payment policies. In the remaining project period, we will use this information to analyze implications for future Medicare payment policy. The special payment provisions examined include (1) bonus payments to physicians in rural HPSAs; (2) reimbursements to rural health clinics and federally qualified health centers; (3) special payments for sole community hospitals, Medicare-dependent hospitals, rural referral centers, EACH/RPCH hospital networks, and Medical Assistance Facilities; and (4) capitation payments in rural counties, especially in underserved areas (Farley, et al., 1999).

This report presents the preliminary findings of our analysis of rural hospitals, and inpatient utilization by rural Medicare beneficiaries. We first examine the numbers and distributions of rural hospitals, including hospitals that qualify under one of the Medicare special payment policies established to support rural hospitals that are important to their local communities but are financially vulnerable due to small sizes or low rates of utilization. Then, trends in inpatient utilization and spending for rural hospital services are considered.

BACKGROUND

Rural communities face challenges in protecting the stability of the institutional providers that historically have served their residents. Low patient volumes in sparsely populated areas

with relatively large numbers of uninsured make it difficult for service delivery organizations to be financially stable (ProPAC, 1991). Rural hospitals tend to be small and offer a limited range of services compared to their counterparts in more densely populated regions. In 1996, 72 percent of hospitals outside of Metropolitan Statistical Areas (MSAs) had 100 or fewer beds and 47 percent had fewer than 50 beds.[1] Rural hospitals with less than 100 beds are less likely to offer a range of services considered standard in more densely populated regions. Instead, they provide proportionately more outpatient and long-term care services, compared to urban hospitals, and these services have had growing shares of total hospital services during the 1990s.

During the 1990s, in particular the first half of the decade, many rural hospitals discontinued operation (Office of Inspector General (HHS), 1990, 1993, 1994, 1998; Moscovice et al., 1999). Trends of hospital closures reported by the Office of the HHS Inspector General (OIG) showed that closures of rural hospitals were highest in 1987 through 1989, peaking in 1988. Hospital representatives reported to the OIG that they closed because of a combination of "...lagging revenues, declining occupancy, and rising costs" (OIG, 1993). The annual number of closures declined gradually, ebbing in 1994, and relatively small numbers of closures continued to occur after that year. Rural hospitals that closed were smaller and had lower occupancy, on average, than other rural hospitals. Neither Medicare nor Medicaid utilization for closed hospitals was consistently higher or lower than for the remaining hospitals (OIG, 1990, 1993, 1994, 1998).

Studies of hospital utilization by rural residents found that a substantial share of inpatient stays for rural residents are in urban hospitals. Williamson and associates (1993) found that 44 percent of rural residents in the state of Washington went to urban hospitals when they were hospitalized for surgery. Although the presence of surgical providers increased use of local hospitals, a substantial proportion of patients getting basic surgical procedures bypassed available local services in favor of urban hospitals. Another study of a nationwide sample of rural residents found that they chose to use urban hospitals for an average of one-third of their hospital stays, and residents with higher incomes were more likely to do so. Therefore, low-income rural

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[1] By comparison, Medicare-certified hospitals in MSAs had an average of 265 certified beds in 1998, and an estimated 25 percent have fewer than 100 beds.

residents appear to be more vulnerable to access problems when local hospital closures, mergers and consolidations reduce the level of local service provision (McNamara, 1998). This concern is reinforced by findings that medical admissions decreased significantly in areas with hospital closures, and patients in closure areas were more likely to be admitted to urban teaching hospitals following the closure of their local hospital. Physician services were not found to substitute for inpatient services following a closure (Rosenbach and Dayhoff, 1995).

Medicare Policy Regarding Rural Hospitals during the 1990s

Provisions contained in the Omnibus Reconciliation Acts of 1987 and 1989, and subsequent revisions to hospital and physician payment rules, influenced Medicare payments to rural providers throughout the 1990s. More recently, the Balanced Budget Act of 1997 (BBA, Public Law 105-33) and the Balanced Budget Refinement Act of 1999 (BBRA, Public Law 106-113) contained a number of provisions with implications for the financing and delivery of Medicare-funded services in rural areas. Provisions addressed fee-for-service payments for rural hospitals, skilled nursing facilities (SNFs), home health agencies, and ambulance services, which can be anticipated to have complex effects for rural hospitals and other providers.

The Medicare Prospective Payment System (PPS), enacted in the early 1980s, was designed to create efficiency incentives while compensating hospitals for reasonable costs of care for Medicare beneficiaries. PPS payments are based on the expected cost of care for a patient stay within Diagnosis-Related Groups (DRGs). Poor financial performance of rural hospitals under PPS, relative to their urban counterparts, raised concerns about the adequacy of rural payments. In a 1991 report to Congress, ProPAC traced the poor financial performance of rural hospitals under PPS to three main factors: (1) declining patient volume that reduced revenues; (2) lower rural standardized amounts on which PPS payments are based, and (3) low patient volume that increased the relative share of fixed costs. A number of other technical issues also hurt rural hospitals, such as outlier payment pools, wage indices, and payment policy for transfer cases.

During this decade, Congress enacted a number of payment policy revisions for rural hospitals in response to these issues, as summarized in Table 1.1. Modifications were made to the PPS, and different payment methods were established or revised for specially designated rural

hospitals. PPS modifications include phase-in of larger updates for rural standardized amounts to bring them closer to urban rates; reduction in the rural outlier payment pool, to increase the rural standardized amount; allowances for reclassification of rural hospitals in areas adjacent to urban areas to allow them to be paid using the higher urban standardized amounts and wage indices; and adjustments to disproportionate share (DSH) payments for rural hospitals.

Table 1.1
Chronological History of Medicare Payment Policies for Rural Providers

Year	Program
1984	The implementation of the Medicare prospective payment system (PPS) includes special payment provisions to rural hospitals.
1987	Separate outlier pools established for urban and rural hospitals.
1988	Rural referral centers paid on the basis of standardized amount for urban areas.
	Higher updates for rural hospitals to improve financial performance.
1989	OBRA 89 authorizes Medicare payments for EACH/RPCH demonstrations in seven states for inpatient and outpatient services.
1990	More rural hospitals become eligible for DSH adjustment
	More generous payments to sole community hospitals (SCHs). Special payment rules for Medicare Dependent Hospitals established (MDH) whereby MDHs paid as SCHs.
1991	Rural hospitals again granted higher updates to phase in elimination of the differential in standardized amounts for urban and rural hospitals by 1995.
1992	Initiated program that allows re-classification of rural hospitals adjacent to metropolitan areas to obtain higher urban payments and wage indices.
1993	First RPCH certified by Medicare. By 1997, 38 RPCHs operate in six states.
1997	Balanced Budget Act (BBA) contained a large number of provisions affecting fee-for-service Medicare and Medicare managed care in rural areas. These provisions will be phased in at differing rates over the next several years, beginning in 1998.

Congress created several new categories of rural hospitals with more favorable payment provisions to improve financial performance. Sole community hospitals (SCH) were designated early in the 1980s using criteria to ensure access for Medicare beneficiaries residing in non-metropolitan counties. Rural referral centers (RRC) are larger rural hospitals that receive patients from other hospitals. Small rural Medicare-dependent hospitals (MDH) were designated from April 1990 through March 1993, and they were reactivated in 1997 by the BBA. Eligibility and payment provisions for each of these hospital categories are summarized below.

Two demonstrations were in operation during the 1990s to test alternative models for limited-service rural hospitals that refer to larger, full-service facilities. In 1988, the Montana

Medical Assistance Facility (MAF) demonstration began, which designated small, limited-service hospitals within the state. In 1989 Congress authorized a demonstration for the Essential Access Community Hospital (EACH) program in seven states. Beginning in 1991, this demonstration tested another rural hospital network model, with the purpose of improving the quality and efficiency of underutilized rural hospitals. Each network consisted of an Essential Access Community Hospital as the full-service referral hospital, plus one or more Rural Primary Care Hospitals (RPCH) that provided emergency care, basic inpatient treatment (with a limit of 6 beds), and primary care services on an outpatient basis. More complex cases are referred to a full service EACH hospital in its network. EACHs are paid as sole community hospitals, and RPCHs are reimbursed based on costs. By 1997, networks were operating in 6 states with a total of 38 RPCH hospitals (GAO, 1998).

Health Care Shortage Areas

Eligibility for many of the rural programs and payments being addressed by this project requires service providers to operate in underserved areas, which are designated based on Congressional provisions for Medically Underserved Areas/Populations (MUA/P) and Health Professional Shortage Areas (HPSAs). These areas are designated by the Health Resources and Services Administration (HRSA) through its regulatory process. HRSA re-examines and modifies HPSA designations at least every three years, as required by federal law. HRSA also has added new MUA/P designations periodically through the 1990s, but no existing MUA designations have been deleted.

In response to requirements of the Health Centers Consolidation Act of 1996, HRSA is revising the criteria and procedures for designating MUA/Ps and HPSAs. Earlier proposed changes provided for the HPSAs to be a subset of the MUA/Ps and use of a consistent set of criteria to determine the two designations (HRSA, 1998). In response to extensive comments received on these proposed rules, HRSA is making substantial changes to the methodology, with plans to publish a revised proposed rule in 2001.

Medicare Changes Introduced Since 1997

The BBA of 1997 and BBRA of 1999 are two legislative milestones that will affect rural Medicare providers substantially for the foreseeable future. The BBA contained provisions that changed payment policy in both the fee-for-service and managed care sectors of Medicare. The BBRA modified and extended the BBA provisions. Many of the provisions enacted by the BBA and BBRA are expected to adversely affect rural hospitals because of the heavy reliance of rural hospitals on Medicare patients, the small number of Medicare risk contracts in rural areas, and the importance of outpatient, home health, and skilled nursing care to rural hospitals (Mueller, 1997; Mueller and McBride, 1999).

Selected BBA provisions relevant to rural hospitals were:

- Reinstated and extended the Medicare-dependent small rural hospital (MDH) classification, which expired in 1994, and updated the target amount for inpatient costs;
- Grandfathered rural referral center status for any hospitals designated in 1991;
- Allowed rural referral centers and Medicare dependent hospitals to obtain reclassification to use an urban wage index for PPS payment calculation on the basis of comparisons of average hourly wages of hospitals in the same areas;
- Replaced EACH/RPCH networks and the Montana MAF program to the Rural Hospital Flexibility Program with designations for Critical Assess Hospitals (CAH), bed limit increase to 15 and maximum length of stay to 92 hours, and opening of program to all 50 states;
- Introduced prospective payments for hospital outpatient services and certain Part B services for inpatients with no Part A coverage;
- Introduced prospective payments for skilled nursing facility and home health services, which previously had been cost-based reimbursement.

Selected BBRA provisions relevant to rural hospitals were:

- Permitted reclassification of certain urban hospitals as rural hospitals;
- Made improvements in the critical access hospital (CAH) program;

- Extended the Medicare dependent hospital (MDH) program for five years;
- Allowed rebasing of payments for certain sole community hospitals to their fiscal year 1996 reporting period;
- Provided a one-year increase in sole community hospital payment;
- Eliminated certain restrictions with respect to the hospital swing bed program.

OVERVIEW OF HOSPITALS WITH SPECIAL MEDICARE PAYMENTS

The scope and history of the Medicare special payment policies for inpatient services by rural hospitals reflect the diversity of issues faced by rural hospitals serving Medicare beneficiaries. By 1990, the full set of these special payment policies had been established for the following designated hospitals, although modifications continued throughout the 1990s:

- Sole Community Hospitals (SCH)
- Rural Referral Centers (RRC)
- SCH/Rural Referral Centers
- Medicare Dependent Hospitals (MDH)
- Essential Access Community Hospital (EACH)
- EACH/Rural Referral Center

Because each special payment designation responded to a unique set of issues for rural hospitals, both the eligibility criteria and payment methodologies differ substantially. We summarize these provisions below. In addition, we describe two other provisions that increase payments for rural hospitals: reclassifying hospitals so an urban wage index is used to establish PPS payments, and higher disproportionate share (DSH) payments for certain rural hospitals.

An overview of the hospital supply in counties outside of Metropolitan Statistical Areas for the year 2000 is presented in Table 1.2, including the total number of hospitals, distribution by bed size, and distribution by special designation category. We refer to these hospitals as "non-metropolitan" rather than "rural" because rural location is not the same as location in counties that are not in an MSA. Some hospitals located within an MSA serve rural populations in the less urbanized portions of the MSA. Similarly, some hospitals in non-MSA counties are located in cities and serve urbanized populations.

Of the 2,136 Medicare-certified, non-metropolitan hospitals existing in the year 2000, 57.7 percent had fewer than 50 beds and only 3.2 percent had 200 or more beds. Hospitals with

no special designation were only 39.1 percent of the total, indicating the importance of special Medicare payments for non-metropolitan hospitals. In our trend analysis, we track changes in the total numbers of hospitals during the 1990s, as well as designations for special payments and wage index reclassifications.

Table 1.2
Profile of Non-Metropolitan Hospitals by Size and Special Designation Status, 1999

Hospital Category	Number	Percentage of Total
All non-metropolitan hospitals	2,136	100.0%
Distribution by bed size:		
0-49 beds	1,233	57.7
50-99 beds	535	25.0
100-149 beds	219	10.3
150-199 beds	81	3.8
200 or more beds	68	3.2
Distribution by special designation		
No special designation	835	39.1
Rural referral center (RRC)	150	7.0
Sole Community Hospital (SCH)	661	30.9
Medicare-dependent hospital	352	16.5
SCH and RRC	57	2.7
Reclassified hospitals (2000)	426	19.9

SOURCE: Table II in Final Rule: Medicare Program; Changes to the Hospital Inpatient Prospective Payment Systems and Fiscal Year 2001 Rates, 65 FR 47196, August 1, 2000.

Special Payment Designations

Sole Community Hospitals. This designation provides payment protection for hospitals in isolated locations that are the sole source of inpatient services reasonably available to Medicare beneficiaries. Effective April 1, 1990, hospitals that qualified as sole community hospitals were paid the highest of three rates: (1) the updated hospital-specific rate based on the hospital's 1982 costs per discharge; (2) the updated hospital-specific rate based on its 1987 costs per discharge; or (3) the Federal PPS rate, including any applicable outlier amount. A provision of the BBRA allows a sole community hospital to elect to rebase its special payments on the basis of the hospital's costs per discharge for its fiscal year 1996 reporting period, if the hospital was paid during 1999 on the basis of either its 1982 or 1987 costs per discharges. Sole community hospitals also receive special treatment under criteria for geographic reclassification and the disproportionate share (DSH) payment adjustment (discussed below).

Designation as a sole community hospital remains in effect without need for reapproval unless there is a change in the circumstances under which the designation was approved. Hospitals that were granted exemptions from the hospital cost limits before October 1, 1983, were automatically classified as sole community hospitals. Any other rural hospital seeking designation must meet one of the following criteria:[2]

- Located more than 35 miles from other similar hospitals; or
- Located between 25 and 35 miles from other similar hospitals and
  - ➢ No more than (1) 25 percent of total inpatients or (2) 25 percent of Medicare inpatients admitted to hospitals from the hospital's service area are admitted to similar hospitals located with a 35-mile radius of the hospital or to larger hospitals within the hospital's service area, or
  - ➢ Has fewer than 50 beds and would admit at least 75 percent of the inpatients from its service area except that some patients seek specialized care it does not provide, or
  - ➢ Other similar hospitals are inaccessible for at least 30 days in each 2 out of 3 years because of local topography or prolonged or severe weather conditions;
- Located between 15 and 35 miles from other similar hospitals, but because of local topography or prolonged severe weather conditions, the other similar hospitals are inaccessible for at least 30 days in each 2 out of 3 years; or
- The travel time between the hospital and the nearest similar hospital is at least 45 minutes because of distance, posted speed limits and predictable weather conditions.

Rural Referral Centers. For discharges occurring before October 1, 1994, hospitals that qualified as rural referral centers were paid based on the "other urban" prospective payment standardized amount, rather than the rural amount, adjusted by the DRG weight and the hospital's area wage index. Following that date, the "other urban" and rural standardized amounts were the same. However, rural referral centers continue to receive special treatment

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[2] A hospital not in a rural area may be designated as a sole community provider if it is located more than 35 miles from other similar hospitals.

under the payment adjustment and criteria for geographic reclassification (discussed below). To qualify as a RRC, a hospital must be located in a rural area and meet all of the following criteria:

- Have a case-mix index of at least 1.276 for fiscal year 1991, or that equals the median case-mix index for urban hospitals (excluding hospitals with approved teaching programs) calculated by HCFA for the census region in which the hospital is located;
- For the cost reporting period that began during fiscal year 1991, have at least 5,000 discharges, or discharges equal to the median number of discharges for urban hospitals in its census region, or have at least 3,000 discharges if an osteopathic hospital; and
- Have at least 275 beds or meet one of the following criteria:
  - More than 50 percent of the hospital's active medical staff are specialists,
  - At least 60 percent of its discharges are for inpatients who reside more than 25 miles from the hospital, or
  - At least 40 percent of all inpatients treated are referred from other hospitals or from physicians not on the hospital's medical staff;

HCFA reviews referral center status every three years. Beginning on October 1, 1992, to retain referral center status, a hospital must meet the applicable criteria in the current year or for at least 2 of the last 3 years.

SCH/Rural Referral Centers. Some rural hospitals qualify for designation as both sole community hospitals and rural referral centers. Payments for these hospitals are the greatest allowed under either designation. In addition, special DSH payment adjustments are defined for hospitals with both designations.

Medicare Dependent Hospitals. The designation of Medicare dependent hospitals was first available to rural hospitals for cost reporting periods beginning on or after April 1, 1990 and ending on or before March 31, 1993. The BBA reinstated and extended this designation from October 1, 1997 through October 2001, and the BBRA further extended it another five years through October 2006.

Hospitals that qualify as Medicare dependent hospitals are paid based on the sum of the Federal payment rate applicable to the hospital and the amount by which the Federal rate is exceeded by a specified percentage of the higher of (1) the hospital-specific rate based on the hospital's 1982 costs, or (2) the hospital-specific rate based on its 1987 costs. The applicable percentages for the hospital-specific rates are 100 percent for discharges occurring on or before April 1, 1993 and 50 percent for discharges occurring between April 1993 and October 1994 and occurring from October 1, 1997 through October 2006.

To qualify for this designation, a rural hospital must meet all of the following criteria:

- Has 100 or fewer inpatient beds,
- Is not classified as a sole community hospital, and
- Was dependent on Medicare for at least 60 percent of its inpatient days or discharges for its cost reporting period that began during fiscal year 1987.

Essential Access Community Hospital. Designated by participating states and approved by HCFA, hospitals that qualify as Essential Access Community Hospitals (EACH) are the referral hospitals for rural hospital EACH/RPCH. These hospitals are paid as sole community hospitals. With the introduction of the Medicare Rural Hospital Flexibility Program, effective October 1, 1997, no new EACH designations may be made. Existing EACHs continue to be paid as sole community providers as long as they comply with the requirements under which they were designated as EACHs. A participating state could designate a hospital as an EACH if the hospital:

- Was located in a rural area more than 35 miles from a hospital designated as either an EACH or a rural referral center, or meets other geographic criteria set by the state;
- Had at least 75 inpatient beds or is located more than 35 miles from any other hospital; and
- Had executed agreements with RPCHs participating in the rural health network to provide emergency and medical backup services, accept patients transferred from RPCHs, exchange data with RPCHs, and grant staff privileges to physicians who provide care at the RPCHs.

EACH/Rural Referral Center. Some EACHs also qualify for designation as rural referral centers. Payments for these hospitals are the greatest allowed under either designation.

Rural Hospitals Reclassified for Standardized Amount or Wage Index

The Medicare Geographic Classification Review Board has the responsibility for making determinations of hospital reclassification for purposes of payments under the Prospective Payment System. Hospitals may be reclassified to permit use of a higher standardized payment amount or wage index from another area in the PPS payment calculation. A hospital in a rural county may be reclassified through one of three available mechanisms:

- The hospital is a sole community hospital or rural referral center;
- The hospital demonstrates close proximity to the area to which it seeks reclassification, such that the distance from the hospital to the area is no more than 35 miles, and at least 50 percent of the hospital's employees reside in the area. The hospital also must meet financial criteria for reclassification for an area's standardized amount or wage index:
  - To receive an area's standardized amount, the hospital must demonstrate its incurred costs are more comparable to the amount it would be paid if it were reclassified than its payment under its current classification.
  - To receive an area's wage index, the hospital must demonstrate (1) its incurred wage costs are comparable to hospital wage costs in the area, (2) the hospital average hourly wage is at least 108 percent of the average for hospitals where the hospital is located, and (3) the aggregate average hourly wage for all hospitals in the rural county is at least 84 percent of the average wage in the area, or the average wage weighted for occupational categories is at least 90 percent of the urban area's average wage.
- The hospital is a participant in a group of all hospitals in a rural county applying for reclassification, the rural county is adjacent to an MSA, and the group demonstrates that:
  - the rural county meets the Bureau of Census standards for redesignation to an MSA as an outlying county, and
  - the aggregate average hourly wage for all hospitals in the rural county is at least 85 percent of the average wage in the adjacent urban area, or the average wage weighted for occupational categories is at least 90 percent of the urban area's average wage.

Special Provisions for Disproportionate Share Payments

Adjustments are made to the Federal portion of the operating cost DRG payment to allow additional payments for hospitals serving a disproportionate share of low income patients. A DSH percentage is calculated for each hospital as the sum of (1) the percentage of Medicare Part A patient days attributable to patients who also are SSI recipients, and (2) the percentage of total patient days attributable to patients entitled to Medicaid but not Medicare. A rural hospital qualifies for an operating cost DSH adjustment if it has a DSH percentage of:

- At least 15 percent for a rural hospital with 500 or more beds;
- At least 30 percent for a rural hospital that has more than 100 beds but fewer than 500 beds, or is classified as a sole community hospital; or
- At least 45 percent for a rural hospital with 100 beds or fewer that is not classified as a sole community hospital.

For each rural hospital group that qualify for DSH payments, the adjustments are:

Type of Rural Hospital	DSH Payment Adjustment Factor
With 500 or more beds, and at least 15% DSH percentage	The same as for urban hospitals with 100 or more beds with a DSH percentage of at least 15%.
With 100-499 beds or a sole community hospital, and 30% DSH percentage	a. If rural referral center – 4 percent plus 60 percent of difference between DSH percentage and 30 percent. b. If sole community hospital – 10 percent. c. If SCH/rural referral center – the greater of (1) 10 percent and (2) 4 percent plus 60 percent of difference between DSH percentage and 30 percent.
With 100 beds or fewer, not a SCH, and at least 45% DSH percentage	4 percent.

SCOPE OF ANALYSIS FOR NON-METROPOLITAN HOSPITALS

The analysis presented in this report describes trends during the 1990s in the distribution, characteristics, and utilization of both the total supply of hospitals in non-metropolitan counties and hospitals with special designations for payment purposes. In addition, we describe trends in utilization of inpatient services by Medicare beneficiaries residing in non-metropolitan counties, including examination of the extent to which they use urban versus rural hospitals and

differences in the types of admissions to each type of hospital. The analyses were designed to address the following basic questions:

How has the supply of Medicare-certified hospitals in rural areas, and the mix of services they offer, changed during the decade of the 1990s?

How have service volumes and payments for Medicare inpatient services in rural hospitals changed during this time period?

What are the trends in the levels and mix of service activity for Medicare beneficiaries and associated spending for sole community hospitals, rural referral centers, and Medicare dependent hospitals?

In Section 2, the methods we used for the analyses are summarized, including data preparation, analysis plan, and measurement of key variables. The next four Sections present analytic results for trends in the availability of hospitals and utilization of hospital inpatient care in non-metropolitan counties. In Section 3, we examine the supply of all Medicare-certified short-term hospitals in non-metropolitan areas from 1992 through 1998, including their characteristics and location by type of rural location, as defined by the 1993 Urban Influence Codes. In Section 4, we report similar trend information broken down by categories of hospitals that Medicare pays under one of several special payment provisions designed to help support the hospital infrastructure in rural areas. Sections 5 and 6 present trends in hospital inpatient utilization and spending for Medicare beneficiaries from two distinct perspectives: (1) a hospital-based analysis for non-metropolitan hospitals (Section 5), and (2) a beneficiary-based analysis for beneficiaries residing in non-metropolitan counties (Section 6).

Section 2.

METHODS AND DATA

Medicare policy for the non-special status hospitals was fairly constant through 1997, with a notable exception being the phasing in of a higher hospital standardized amount for rural hospital payments through 1994. Reports by the Prospective Payment Assessment Commission, the HHS Office of Inspector General, the University of Minnesota, and other organizations have documented these trends in the availability of rural hospitals and Medicare payments for inpatient services (ProPAC, 1991; OIG, 1993, 1998; Moscovice et al., 1999). We extend the information from those reports by examining trends in the numbers and characteristics of Medicare-certified hospitals in rural areas, and inpatient utilization and spending over time.

ANALYSIS PLAN

To examine trends from 1992 through 1998 for the supply of rural hospitals and utilization of inpatient services, we used a combination of facility-level data on rural hospitals and Medpar data on inpatient utilization and spending. Using Provider of Service files and Provider Specific files for these years, combined with geographic data from the ARF, we identified all Medicare-certified, short-term hospitals located in non-metropolitan counties, and we classified them according to county location based on Urban Influence Codes, as well as by special status under Medicare payment policies. Characteristics of these hospitals were profiled using data from the Medicare Provider of Service files and Provider Specific Files.

We then analyzed Medicare hospital inpatient utilization and expenditures, using Medpar claims data for the 100 percent beneficiary sample, taking two distinct approaches. First, we analyzed trends in utilization and Medicare spending for *services by rural hospitals*, by type of special payment status and by hospital location. Second, we analyzed trends in utilization and spending on hospital inpatient services *for Medicare beneficiaries* residing in rural areas, by beneficiary location. Overall standardized average payments also were estimated for a standard DRG mix of patients, to decompose payment effects versus case mix effects across hospitals.

The method we used to define rural locations was based on whether or not a hospital was located in a county that is part of a Metropolitan Statistical Area (MSA), as defined by the

Bureau of the Census. All counties outside of an MSA were considered to be rural for purposes of this analysis. This definition is consistent with the geographic boundaries used in Medicare payment schedules for most institutional provider services. However, county boundaries obscure a wide range of local characteristics because each county contains a mix of urbanized and more truly rural locations. Counties that are not in MSAs have fewer and smaller urbanized locations than MSA counties, but they are not uniformly rural in nature. Therefore, we refer to these counties as "non-metropolitan" counties, rather than "rural," We address this further below in our definition of non-metropolitan county categories, as well as in our analysis plan for the full study of which this hospital analysis is a component (Farley, 1999).

DATA SOURCES

This analysis involved drawing together and linking data from several sources, including the following:

1. Annual Medicare Provider of Service (POS) files for 1992 through 1998, which identified the hospitals serving Medicare beneficiaries and provided information on their characteristics and certification status;
2. Annual Provider Specific Files for 1992 through 1998, which provided data used to calculate Medicare payments for the hospitals, including codes for their special payment status;
3. An extract of the Area Resource File (ARF extract), which provided county-level information on Urban Influence Codes, provider supply, population, and other environmental variables;
4. County-level summary files containing counts of Medicare beneficiaries;
5. Medpar claims for short-term inpatient hospital services for the 100 percent sample of Medicare beneficiaries for 1992 through 1998, which we subset to include all claims for beneficiaries residing in non-metropolitan counties or hospitals located in these counties;
6. Files of Medicare DRG code numbers, names, and weights.

We used SSA state and county codes to link provider-level data or Medpar claims to county-level measures (e.g., degree of rurality, HPSA,) in the ARF extract file. County characteristics were appended to hospital data for analyses of hospital supply, and were appended

to claims data for analysis of utilization and spending. We also used the hospitals' Medicare provider numbers to link hospital characteristics to the Medpar inpatient claims for analyses of utilization and expenditures.

The availability of certain county-level data influenced the sets of counties we were able to include in each analysis. The Medicare program recognizes a larger set of counties (or other similar geographic jurisdictions) than those included in the ARF, which is reflected in the set of counties for which AAPCCs have been established historically. The ARF contains only one record for the entire state of Alaska, whereas SSA county codes exist for a number of Alaskan boroughs. A discrepancy also existed for a set of independent cities in Virginia, which the state separates legally from historical county boundaries to form their own jurisdictions and are recognized by Medicare. We added new records for the Alaska boroughs and the Virginia independent cities to our analysis file, for which we obtained data on the 1990 population, UICs, Metropolitan Statistical Areas, and Medicare beneficiary counts.

We could not obtain data for the new Alaska or Virginia independent cities on HPSAs, MUAs, or other county characteristics that were on the ARF. For any analyses that used these variables, we worked with the smaller set of counties for which we had the full set of data. Alaska counties were dropped from these analyses, and the Virginia independent cities were re-combined with the counties from which they were extracted.

DEFINING THE STUDY POPULATIONS

Two populations were of interest for this analysis of inpatient services in rural areas. The first was the set of hospitals located in non-metropolitan counties, which represent the local supply of inpatient services. The second was the Medicare beneficiaries residing in these counties who were users of hospital services in each year. These beneficiaries may choose to use local, rural hospitals or more distant, urban hospitals for the inpatient care they need. We were interested in documenting trends in the mix of hospital services used during the decade of the 1990s.

Identification of Non-Metropolitan Hospitals

The hospitals included in the analytic data base for each year in our study period were all short-term hospitals that were located in counties outside of Metropolitan Statistical Areas and were certified in Medicare in any given year. Using merged data from the POS file and Provider Specific File for each year, we retained all hospitals that (1) were in the Provider Specific File, which indicated they were being paid by Medicare according to the provisions of the Prospective Payment System, and (2) had current Medicare certification during the year, as defined by either not having a termination date or having a termination date later than January 5. These criteria eliminated all hospitals that served Medicare beneficiaries on an emergency basis (e.g., military hospitals or hospitals in Canada or Mexico) as well as hospitals that discontinued Medicare participation (e.g., for loss of certification, closure) before the year of interest.

We note that this approach relied on the certification data in the POS file, and to the extent that terminations are not correctly recorded in the POS, we have included some hospitals that should not be in our study population. This data problem would affect results from our analyses of provider supply, but would not affect the analyses that use the Medpar claims because the claims represent services actually provided by hospitals to Medicare beneficiaries, which presumes Medicare certification or status as emergency or other types of hospitals.

It was necessary to have complete data for the SSA state and county codes that identify hospital location to achieve a good match between the hospital records in the POS and the ARF extract file. We found that codes for the county of location was missing for up to 42 hospitals in each annual POS. Using city names reported in the POS, we identified city-and-county linkages in a Rand McNally index (2000) to link the cities to county names for each of these hospitals. Then we looked up the SSA county codes in the 1997 AAPCC file, and assigned the county codes to the hospitals.

Beneficiaries Using Inpatient Services

The Medpar claims for 100 percent beneficiary sample identify the Medicare beneficiaries who use hospital inpatient services each year, and from these files, we extracted all claims for beneficiaries with counties of residence in the non-metropolitan counties. In addition,

we used HCFA files that provided counts of all beneficiaries residing in each county to establish county-level data on the total beneficiary population for the analysis.

KEY ANALYTIC VARIABLES

The key analytic variables that we derived for our analyses are described here. The report on the AAPCC analysis (Farley, et al., 2000) describes in detail the construction of analytic variables that are being used for all our analyses of Medicare special rural providers or payments, such as degree of rurality, geographic location. We summarize here some key characteristics and limitations of the data that are described in greater detail in the AAPCC report, and we also define other variables we derived specifically for this rural hospital analysis.

Rural Shortage Areas

Location in a Health Professional Shortage Area (HPSA) or a Medically Underserved Area (MUA) has less policy significance for Medicare payment policies for rural hospitals than it does for other types of providers, such as rural health clinics or physician bonus payments. However, it is important to examine access to inpatient care for Medicare beneficiaries residing in shortage areas, including the amount of care they obtain and the mix of rural or urban hospitals they for this care. For each shortage area definition (MUA and HPSA), we identified the non-metropolitan counties with either designation as whole-county shortage areas or containing at least one partial-county shortage area.

HPSA and MUA designations are determined by the federal government using separate sets of criteria. A HPSA designation refers to a geographic area or population having fewer than one primary care physician per 3,500 people.[3] A medically underserved area (MUA) is designated based on primary care ratios as well as community income levels, the infant mortality rate, and other factors. These designations are available for selected years during the study period. For example, HPSA designations are available in the ARF for years 1993, 1995, 1996, and 1997. MUA designations as of the year 1998 were used, which included all designations

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[3] Additional criteria are applied including a national area for delivery of services, high need for primary care services, or insufficient capacity of current providers.

made since the inception of the MUAs (i.e. MUA designations were added over time but no areas had their designation removed).

Measures of Extent of Rurality

Grouping by Urban Influence Codes. Variables were constructed to characterize the degree of rurality for each county in the country, using categories that collapsed nine categories of the Urban Influence Code (UIC) to seven categories (USDA 2000). Based on the method outlined in our analysis plan, (Farley et al., 2000), counties located in Metropolitan Statistical Areas (MSA) were designated as large or small metropolitan counties (UIC codes = 1, central and fringe counties in metropolitan areas of 1 million population or more, and UIC = 2, counties in metropolitan areas of fewer than 1 million population, respectively). Counties located outside of MSAs (non-metropolitan counties) were categorized into the following categories:

1. counties that are adjacent to an MSA and have a city of at least 10,000 population (UIC codes 3 and 5);
2. counties that are adjacent to an MSA and do not have a city of at least 10,000 population (UIC codes 4 and 6);
3. remote counties that are not adjacent to an MSA and have a city of at least 10,000 population (UIC code 7),
4. remote counties that are not adjacent to an MSA and have a town of 2,500 to 9,999 population (UIC codes 8), and
5. remote counties that are not adjacent to an MSA and do not have a town of at least 2,500 population (UIC codes 9).

Urban Influence Codes have not been updated since their publication in 1993. Consequently the stratification of counties using these codes may not reflect the actual rural designation that applied to a county in later years of the study period. To estimate the sensitivity of the categories coded to the use of 1993 designations in later years, we compared the numbers of counties (with clinics) identified in 1998 as being inside or outside a MSA to the numbers found using the 1993 urban influence codes (which distinguish MSA from non-MSA). We found that only a small number of counties would be classified differently if 1998 MSA status

were used. Using 1992 POS facility counts, we found that 4 FQHCs and 8 RHCs would be re-classified to metropolitan.

Frontier Counties. As discussed in the AAPCC report, an important descriptive characteristic of rural facilities is whether they are located in a frontier county. Counties were defined as frontier if they had a population density of 6 persons per square mile or less based on 1990 Census population counts. Counties designated as frontier are largely concentrated in a group of Western states. We included this geographic demarcation in our definition of a frontier county by excluding some counties in Minnesota, the South, and the Northeast that have low population densities that otherwise would qualify them as frontier.

Hospital Characteristics

Ownership Status. The POS file defines eight ownership categories for hospitals based on survey data obtained for the Medicare certification application (HCFA 1991). These categories include for-profit ownership, three categories for non-profit ownership (church, private, other), and four categories for government-owned facilities (federal, state, or local government, or independent hospital authority or district). We collapsed these categories into five: for-profit, non-profit, federal or state government, local government, or hospital district/authority.

Hospital Size and Capacity. The measures used to profile the sizes of hospitals were the bed size and the total staffing. We measured beds as Medicare-certified beds rather than total beds, because this measure is more relevant to utilization by Medicare beneficiaries. We measured staffing as the number of full-time equivalent (FTE) staff for all categories of staff reported by the hospitals on their survey forms and contained in the POS file.

Mix of Services Offered. The POS file offers fairly rich information on specific types of services provided by hospitals, including identification of organized units for specialized inpatient services (e.g., psychiatric or physical rehabilitation), number of beds for specified services, and identification that a hospital offers specified services. We selected three measures of specific services that we used to profile hospitals in our analyses: offers home health services, offers hospice services, and has an organized psychiatric inpatient unit. Hospitals in both urban

and rural locations moved increasingly into providing these services as traditional inpatient census declined during the 1990s, accompanied by substantial growth in utilization of all of these services by Medicare beneficiaries.

Facility type

The Provider Specific Files contain a variable that identifies the status of each hospital according to the Medicare special payment designations for rural hospitals. However, the codes used in this variable changed during the time period for the study, as payment policies were changed by Congress or regulations. We derived a new variable that collapsed the sets of codes used in the original variable into a smaller set of codes that were consistent across all years included in the study (1992 through 1998). We defined our new facility designation codes using the following crosswalk[4]:

RAND Derived Code	Code in Provider Specific File
0 = no special designation	00 or blank = no special designation
1 = sole community hospital	01 = sole community provider
	16 = rebased sole community provider
2 = rural referral center	07 = rural referral center
3 = Indian Health Service hospital	08 = Indian Health Service hospital
4 = SCH/rural referral center	11 = SCH/rural referral center
	17 = rebased SCH/rural referral center
5 = Medicare dependent hospital	14 = Medicare dependent hospital
6 = Medical Assistance Facility (MAF)	18 = Medical assistance facility
7 = Essential access community hospital (EACH)	21 = Essential access community hospital
8 = EACH/rural referral center	22 = EACH/rural referral center
9 = Rural primary care hospital (RPCH)	23 = Rural primary care hospital
10 = Critical access hospital (CAH)	37 = Critical access hospital
20 = other designations for rural hospitals	All other provider type codes
30 = urban hospitals	Located in county in an MSA
40 = emergency hospitals	In the POS file but not Provider Specific File

[4] RPCHs and MAFs are additional categories of rural hospitals with special payment provisions, but we did not analyze them as separate hospital categories because there are few of these facilities (30 to 75 RPCHs and 4 to 12 MAFs) and they account for a very small share of total Medicare inpatient utilization.

Inpatient Utilization and Spending

The variables for hospital inpatient utilization and spending were obtained from the Medpar claims, which provide detail on the reason for hospitalizations and payment amounts.

Utilization. We measured utilization using counts of hospital inpatient admissions and the average length of stay. Length of stay was calculated as the number of days from the "first date" and "last date" variables on the Medpar file. We also used the DRG codes on the claims to measure case mix using the DRG weights on which payments are based.

Spending for Inpatient Stays. The Medpar file provided data on the amounts that Medicare paid for each inpatient stay, as well as payments by other primary payers and amounts to be paid by beneficiaries. We calculated the following two payment amounts using variables on the Medpar claims:

Medicare payment = DRG payment amount + cost pass-through amount

Total payments = Medicare payment + other primary payer payment + beneficiary service deductible + beneficiary blood deductible + beneficiary coinsurance.

Section 3.

SUPPLY AND CHARACTERISTICS OF HOSPITALS IN NON-METROPOLITAN COUNTIES DURING THE 1990s

This section is the first of four Sections presenting analytic results for trends in the availability of hospitals and utilization of hospital inpatient care in rural areas (defined as counties not located in Metropolitan Statistical Areas). We examine here the supply of all Medicare-certified short-term hospitals in non-metropolitan areas from 1992 through 1998, including their characteristics and location by type of rural county, as defined by the 1993 Urban Influence Codes. Detailed trend analyses were performed for all years from 1992 through 1998, but we found that most trends observed were gradual changes over time rather than "abrupt" changes occurring in specific years. Therefore, for ease in reading, we report data only for the years 1992, 1994, 1996, and 1998 unless there are specific reasons to use additional or different years.

SUPPLY OF HOSPITALS

The supply of hospitals in non-metropolitan counties declined slightly during the 6 years between 1992 and 1998. As shown in Table 3.1, the number of Medicare-certified hospitals in non-metropolitan counties decreased an estimated 5.5 percent, from 2,357 facilities in 1992 to 2,227 facilities in 1998. These declines followed earlier reductions in the supply of non-metropolitan hospitals during the 1980s, as well as extensive re-engineering of service mix and operations, as the Medicare prospective payment system was introduced and other health system reform activities arose (ProPAC, 1991; OIG, 1993; Moscovice, et al., 1999).

Table 3.1 also shows where hospitals were located during the 1990s according to the set of 5 categories of rurality we derived using the Urban Influence Codes (see methods in Section 2). Both the numbers of hospitals and percentage distributions by county category are presented. The largest reduction in hospital supply during the 1990s was an 8.3 percent decline in the number of hospitals in the most remote rural counties that had no town of at least 2,500 population. Declines for the four other categories of non-metropolitan counties ranged from a 4.3 percent to 5.6 percent decline. As a result of these trends, the most remote counties had a

smaller share of total non-metropolitan hospitals in 1998 than they had in 1992, as shown by the percentage distributions for these two years.

Table 3.1
Distribution of All Short-Term Hospitals Located in Non-Metropolitan Counties, by County Category, 1992-1998

County Category	1992	1994	1996	1998	Percent Change 1992-1998
All non-metropolitan hospitals	2,357	2,303	2,288	2,227	-5.5%
By county category					
Number of hospitals:					
Adjacent, city 10,000+	394	382	381	372	-5.6
Adjacent, no city 10,000+	668	653	650	632	-5.4
Remote, city 10,000+	350	340	335	331	-5.4
Remote, town 2,500-10,000	633	620	616	606	-4.3
Remote, no town	312	308	306	286	-8.3
Percentage of hospitals:					
Adjacent, city 10,000+	16.7%	16.6%	16.7%	16.7%	0.0
Adjacent, no city 10,000+	28.3	28.4	28.4	28.4	0.4
Remote, city 10,000+	14.8	14.8	14.6	14.9	0.7
Remote, town 2,500-10,000	26.9	26.9	26.9	27.2	1.1
Remote, no town	13.2	13.4	13.4	12.8	-3.0
In frontier counties					
Number of hospitals	283	277	276	256	-9.5
Percentage of rural hospitals	12.0%	12.0%	12.1%	11.5%	-4.2

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

A different perspective on hospital supply in non-metropolitan counties is offered in Table 3.2, which shows the distribution of counties according to the number of hospitals located in each county. An estimated 22.3 percent of the non-metropolitan counties had no hospitals in 1992, and the percentage increased slightly to 24.8 percent in 1998. The majority of counties had only one hospital, and these percentages remained stable over the 6-year period (58.0 percent in 1992 and 57.7 percent in 1998). Hospital losses tended to occur in counties with more than one hospital, thus shifting the entire distribution of counties downward to smaller hospital supplies.

These trends are consistent with findings of the HHS Office of Inspector General, which indicated that access to care did not decline substantially due to hospital closures; that other inpatient and emergency services were located within reasonable travel distances for most

people. In many cases, the closed hospital facilities were being used for some other form of health care (OIG, 1993; OIG, 1998).

Table 3.2
Distribution of Non-Metropolitan Counties, by the Number of Hospitals in the County, 1992-1998

Number of Hospitals	1992	1994	1996	1998
0	22.3	23.1	23.4	24.8
1	58.0	58.2	58.0	57.7
2	15.8	15.0	15.1	14.2
3	2.9	2.8	2.8	2.7
4	0.7	0.6	0.4	0.4
5	0.2	0.2	0.2	0.2
6	<0.1	0	0	0

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: These percentages are calculated for 2,300 non-metropolitan counties.

Reductions in non-metropolitan hospital supply varied widely by region of the country, ranging from a small 1.1 percent loss for the San Francisco region to a large 16.3 percent loss for the New York region, as reported in Table 3.3. Other regions with large losses were Denver (9.0 percent decline) and Kansas City (8.2 percent decline). No region experienced an increase in supply of non-metropolitan hospitals.

Table 3.3
Supply of All Short-Term Hospitals Located in Non-Metropolitan Counties, by HHS Region, 1992-1998

HHS Region	1992	1994	1996	1998	Percent Change 1992-1998
All Regions	2,357	2,303	2,288	2,227	-5.5
1. Boston	65	64	64	62	-4.6
2. New York	43	39	39	36	-16.3
3. Philadelphia	132	133	132	125	-5.3
4. Atlanta	508	495	497	489	-3.7
5. Chicago	416	403	396	391	-6.0
6. Dallas	388	382	379	374	-3.6
7. Kansas City	354	348	344	325	-8.2
8. Denver	233	225	223	212	-9.0
9. San Francisco	89	88	88	88	-1.1
10. Seattle	129	126	126	125	-3.1

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

CHARACTERISTICS OF NON-METROPOLITAN HOSPITALS

As the supply of non-metropolitan hospitals declined gradually during the 1990s, the characteristics of the remaining hospitals also would be expected to shift. Such shifts could be the due to differences in characteristics between the hospitals that closed and those that remained in operation, changes in the way the surviving hospitals provided health care, or a combination of these effects. The hospital characteristics we examined in this analysis were ownership, bed size, staffing, and whether a hospital offered each of three selected services.

In Tables 3.4 and 3.5, we present trends in distributions of non-metropolitan hospitals by type of ownership. Table 3.4 compares ownership trends for all hospitals to those located in frontier counties, and Table 3.5 compares trends by county category based on the UIC codes.

Overall, virtually half of non-metropolitan hospitals are not-for-profit institutions, and only about seven percent are for-profit ownership (Table 3.4). The remainder are government-owned, either federal, state, or local government, or independent hospital district. Ownership mix shifted slightly between 1992 and 1998. The percentage of not-for-profit facilities increased 1.4 percent (47 more hospitals), with an accompanying decline in the remaining ownership categories (83 fewer hospitals), while the number of hospitals owned by hospital districts remained stable.

The trend in ownership mix for hospitals located in frontier counties, also shown in Table 3.4, is quite distinct from the overall patterns for non-metropolitan hospitals. An estimated 60 percent of hospitals in frontier counties are government-owned (Federal, State, or local governments or local hospital districts), compared with 46 percent or less for all hospitals. Within government-owned facilities in frontier counties, there was a large increase (23.4 percent) in the percentage owned by hospital districts and a small increase (3.8 percent) in the percentage of facilities owned by federal or state governments. By contrast, there were substantial declines in the percentage of hospitals owned by local governments (-13.4 percent) and for-profit hospitals (-11.1 percent), as well as a slight decline in the percentage of not-for-profit facilities (-4.0 percent). Fewer than 2 percent of the facilities in frontier counties had for-profit ownership in 1992, and this percentage declined slightly over the 6-year period.

Table 3.4
Mix of Ownership for All Short-Term Hospitals Located in Non-Metropolitan Counties, for All Hospitals and Hospitals in Frontier Counties, 1992-1998

	Percentage of Hospitals by Type of Ownership				Percent Change
Ownership Category	1992	1994	1996	1998	1992-1998
All non-metropolitan hospitals	2,357	2,303	2,288	2,227	
Voluntary not-for-profit	48.4%	48.3%	48.6%	49.1%	1.4%
For-profit	7.2	7.3	7.1	7.0	-2.8
Government-federal, state	2.5	2.6	2.4	2.4	-4.0
Government-local	24.0	23.5	23.1	22.4	-6.7
Hospital. district, authority	17.9	18.4	18.8	19.0	6.1
Frontier counties	283	277	276	256	
Voluntary not-for-profit	37.8%	37.2%	37.0%	36.3%	-4.0
For-profit	1.8	1.8	1.8	1.6	-11.1
Government-federal, state	5.3	5.8	5.4	5.5	3.8
Government-local	30.7	28.9	26.8	26.6	-13.4
Hospital. district, authority	24.4	26.4	29.0	30.1	23.4

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Distributions of hospital ownership by county category, given in Table 3.5, reveal some complex but interesting patterns. We list some highlights here:

- For non-metropolitan counties with a city of at least 10,000 population (either adjacent to an MSA or remote), percentages of for-profit and not-for-profit hospitals are greater than those for other categories of non-metropolitan counties, but percentages for facilities owned by local governments are lower.
- The most remote counties have the largest percentage of hospitals owned by local governments, compared with other county categories.
- The percentages of hospitals owned by hospital districts were highest for remote counties with a town of 2,500 to 10,000 (but not the most remote counties) and for counties adjacent to an MSA without a city of 10,000 population higher;
- The most remote counties had the largest shift in hospital ownership mix between 1992 and 1998. The percentage of hospitals in these counties that were owned by hospital districts increased by 36.4 percent, from 15.4 percent in 1992 to 21.0 percent in 1998. The percentage owned by federal or state governments also increased by 10.3 percent, while

the percentage decreased for not-for-profit hospitals (-11.3 percent change) and for-profit hospitals (-7.1 percent change).

- In remote counties that include a city of 10,000 population or more, the percentage of for-profit hospitals increased by 20.5 percent over time, from 8.3 percent of hospitals in 1992 to 10.0 percent in 1998.

Table 3.5
Mix of Ownership for All Short-Term Hospitals Located in Non-Metropolitan Counties, by County Category, 1992-1998

County Category	Percentage of Hospitals by Type of Ownership				Percent Change
	1992	1994	1996	1998	1992-1998
Adjacent, city 10,000+	394	382	381	372	
Voluntary not-for-profit	56.9%	57.3%	58.5%	58.9%	3.5%
For-profit	9.1	9.2	8.4	8.3	-8.8
Government-federal, state	2.5	2.1	2.1	2.2	-12.0
Government-local	14.2	13.9	13.4	12.1	-14.8
Hospital. district, authority	17.3	17.5	17.6	18.6	7.5
Adjacent, no city 10,000+	668	653	650	632	
Voluntary not-for-profit	46.4%	46.9%	47.9%	48.9%	5.4
For-profit	7.5	8.0	7.4	7.3	-2.7
Government-federal, state	1.2	1.4	1.2	1.1	-8.3
Government-local	24.4	23.1	22.9	22.6	-7.4
Hospital. district, authority	20.5	20.7	20.6	20.1	-2.0
Remote, city 10,000+	350	340	335	331	
Voluntary not-for-profit	55.4%	55.9%	55.2%	55.0%	-0.7
For-profit	8.3	8.5	9.9	10.0	20.5
Government-federal, state	5.4	5.0	4.8	4.8	-11.1
Government-local	18.9	18.8	18.2	18.1	-4.2
Hospital. district, authority	12.0	11.8	11.9	12.1	0.8
Remote, town 2,500-10,000	633	620	616	606	
Voluntary not-for-profit	44.1%	44.7%	44.6%	45.5%	3.2
For-profit	6.5	6.1	6.2	5.9	-9.2
Government-federal, state	2.1	2.6	2.6	2.3	9.5
Government-local	27.2	26.1	25.7	25.3	-7.0
Hospital. district, authority	20.2	20.5	20.9	21.0	4.0
Remote, no town	312	308	306	286	
Voluntary not-for-profit	42.6%	39.3%	38.9%	37.8%	-11.3
For-profit	4.2	4.2	3.6	3.9	-7.1
Government-federal, state	2.9	2.9	2.6	3.2	10.3
Government-local	34.9	36.0	35.6	34.3	-1.7
Hospital. district, authority	15.4	17.5	19.3	21.0	36.4

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Another important dimension of hospital supply is the capacity of each hospital to provide inpatient services for the community it serves. Drawing upon data from the Provider of Service files, we analyzed two measures of hospital capacity: the average number of Medicare-certified beds and average full-time equivalents (FTEs) of total staffing. Bed counts are not the most useful measures of operating capacity because hospitals typically report the beds they are authorized to use, but are staffed to operate a much smaller number of beds. The staff FTE measure offers another view of actual service activity. We could not calculate average daily census or occupancy rates because we only had data for Medicare inpatient stays.

Non-metropolitan hospitals certified by Medicare had an average of 75 certified beds, as shown in Table 3.6, and there was no change in the average number of beds between 1992 and 1998. At the same time, however, average total staffing per hospital increased by 19.2 percent from 213 FTEs to 254 FTEs. These trends suggest that hospitals that discontinued operation during this period, on average, were operating at smaller capacities than the surviving hospitals, even though they reported having similar numbers of certified beds.

Both average bed counts and total staffing reflect variations in average hospital size across categories of non-metropolitan counties. The largest hospitals are clustered in the two categories of counties with a city of 10,000 population (adjacent to an MSA or remote). Hospitals in these counties had an average of 122 to 131 certified beds, depending on the county category and year, whereas hospitals in the other county categories had 60 beds or less. They also had average total staffing that was more than twice the staffing levels of hospitals in other county categories. Hospitals in the most remote counties and frontier counties had the smallest number of certified beds and staffing levels. Bed counts averaged 35 beds in the remote counties with no towns and 30 beds for frontier counties.[5]

There was no change in the average number of certified beds between 1992 and 1998 for hospitals in any of the categories of non-metropolitan counties, but rates of increase in average staffing did vary across county categories. Hospitals in the most remote counties had the largest increase in average total staffing, doubling from 66 FTEs in 1992 to 132 FTEs in 1998.

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[5] Within each county category, hospitals' bed sizes vary substantially, and there are some extremely small rural hospitals. Furthermore, average daily census for some of these hospitals is less than 5 patients.

Hospitals located in counties adjacent to an MSA and having a city of 10,000 population had the smallest staffing increase of 11.7 percent.

Table 3.6
Average Certified Bed Size and Staffing for Short-Term Hospitals Located in Non-Metropolitan Counties, by County Category, 1992-1998

County Category	1992	1994	1996	1998	Percent Change 1992-1998
Average number of beds					
All non-metropolitan hospitals	75	76	75	75	0.0%
By county category:					
Adjacent, city 10,000+	122	124	121	122	0.0
Adjacent, no city 10,000+	59	59	58	58	-1.7
Remote, city 10,000+	129	131	131	129	0.0
Remote, town 2,500-10,000	55	56	55	55	0.0
Remote, no town	33	33	32	35	6.1
Frontier counties	29	29	29	30	3.4
Average total staff FTEs					
All non-metropolitan hospitals	213	227	241	254	19.2
By county category:					
Adjacent, city 10,000+	366	380	398	409	11.7
Adjacent, no city 10,000+	153	161	168	176	15.0
Remote, city 10,000+	400	424	437	476	19.0
Remote, town 2,500-10,000	153	162	184	177	15.7
Remote, no town	66	95	98	132	100.0
Frontier counties	69	72	75	81	17.4

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Beds are Medicare-certified beds. FTEs are full-time equivalent staff employed by a hospital, as reported in the Provider of Service files.

In addition to looking at the raw counts of hospital supply for non-metropolitan counties, it was important to standardize the counts to the size of the markets the hospitals served. We examined two standardized measures of hospital bed supply for this analysis. A widely used measure is the ratio of a supply quantity to the size of the population being served (in this case the number of certified hospital beds per 100,000 population). Such a ratio may not perform well for rural areas, however, because a small rural population in the denominator may inflate the ratio. Therefore, in addition to using beds per population, we calculated beds per square mile as an independent measure of geographic access to inpatient services.

The two hospital supply ratios for non-metropolitan counties for the years 1993 and 1997 are summarized in Table 3.7, with comparisons across county category and for frontier counties. The ratios of hospital beds to population varied much less across county categories than the average numbers of hospital beds reported in Table 3.6, reflecting direct (i.e., positive) relationships between the number of beds and population size. The bed-to-population ratios declined between 1993 and 1997 for all county categories and for frontier counties, due to growth in the county populations, closure of some hospitals, and stability in the bed size (on average) of the remaining hospitals. In addition, bed ratios varied more widely across county categories in 1993 than in 1997. This finding is consistent with the OIG findings that the non-metropolitan hospitals that closed in the intervening years were located in areas with richer hospital supplies relative to their populations, such that bed supply ratios declined faster for those areas than ratios for other areas (OIG, 1996).

We found diverse trends in bed supply per population for the different categories of non-metropolitan counties. Counties adjacent to an MSA *with no city* of 10,000 population had the lowest ratios of beds to population of all county categories in both 1993 and 1997. Remote counties *containing a city* of 10,000 population had the highest average ratio of beds per population in 1993 (439 beds per 10,000 population), but these counties also had the largest declines in bed ratios by 1997. The resulting average ratio of 319 beds per 100,000 population for this category of counties was similar to average ratios for the other categories in 1997. Remote counties containing a town of 2,500 to 10,000 population had the second highest average bed-to-population ratio in 1993, but the lowest rate of decline over time. As a result, these counties had 327 beds per 100,000 population in 1997, the highest of all the county categories. By contrast, the most remote counties had the lowest average bed-to-population ratios in both 1993 and 1997, compared to the other categories.

Variations across county categories in the number of certified beds per square mile highlight familiar issues regarding geographic access to hospital care for rural beneficiaries. In areas with lower ratios, patients must travel greater distances to obtain hospital care. The presence of a city of at least 10,000 population in a county appears to be an important factor for geographic access to hospital care. The two categories of non-metropolitan counties that contain at least one city of 10,000 population had much higher ratios of beds per square mile than those

for the other three county categories, although these beds probably are clustered in the city(s). Although frontier counties had fewer beds per square mile than counties with cities, the average ratios for frontier counties were noticeably higher than those for the more remote counties.

Table 3.7
Average Hospital Bed Supply per Population and per Square Mile for Non-Metropolitan Hospitals, by County Category, 1993 and 1997

County Category	Bed Ratios by Year		Percent Change
	1993	1997	1993-1997
Certified beds/100,000 population			
All non-metropolitan hospitals	334	308	-7.8%
By county category:			
Adjacent, city 10,000+	342	313	-8.5
Adjacent, no city 10,000+	252	228	-9.5
Remote, city 10,000+	439	319	-27.3
Remote, town 2,500-10,000	353	327	-7.4
Remote, no town	307	272	-11.4
Frontier counties	340	303	-10.9
Certified beds/100 square miles			
All non-metropolitan hospitals	6.7	6.4	-4.5
By county category:			
Adjacent, city 10,000+	20.6	19.4	-5.8
Adjacent, no city 10,000+	6.5	6.1	-6.2
Remote, city 10,000+	13.9	13.6	-2.2
Remote, town 2,500-10,000	4.4	4.2	-4.5
Remote, no town	1.5	1.3	-13.3
Frontier counties	9.3	9.3	0.0

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Ratios are measured as the number of Medicare-certified hospital beds per 100,000 total population or per 100 square miles in a county. Averages are summarized across county categories, weighting by the county population or size of county in square miles.

In addition to the generalized measures of bed supply and staffing, we measured trends in selected specific services offered by hospitals in non-metropolitan counties. We view information on these services as both (1) contributing to building profiles of hospitals in non-metropolitan counties and (2) serving as indicators of access to specific services for Medicare beneficiaries living in those areas. We chose to track home health care, hospice services, and psychiatric services because they are important services for Medicare beneficiaries and new Medicare payment rules for these services will affect hospitals providing them. In reviewing data

in the Provider of Service files, we found clear trends of growth in the number of non-metropolitan hospitals offering these services.

We defined three dichotomous variables that measured whether a hospital offered home health care, offered hospice services, or had an organized inpatient psychiatric unit, and we summarized the percentages of hospitals providing each service in the years 1992 through 1998. As shown in Table 3.8, there was substantial growth between 1992 to 1998 in the percentage of non-metropolitan hospitals that offered each of these services. In 1992, an estimated 46.1 percent of hospitals offered home health care, 23.2 percent offered hospice services, and 12.0 percent had a psychiatric unit. By 1998, the percentages of hospitals had increased to 58.1 percent for home health, 36.1 percent for hospice, and 20.1 percent for psychiatric units.

Portions of these increases may be due to closure of hospitals that did not offer these services, but sizeable portions are related to hospitals' expansion into these services over time. The number of hospitals declined by only 5.5 percent during that time (see Table 3.1), and the percentages of growth for all these services exceed that 5.5 percent by large margins, reflecting the introduction of services between 1992 and 1998.

In 1992, hospitals in non-metropolitan counties containing a city of 10,000 population were considerably more likely to provide home health care, hospice services, or an inpatient psychiatric unit, compared with hospitals in the three county categories without a city. Between 1992 and 1998, however, the percentages of hospitals in the other three categories that offered each service grew at high rates, resulting in a "closing of the gap" between hospitals in counties with cities and those in other categories of counties. Yet some differences still remain, most noticeably for the percentage of hospitals having psychiatric inpatient units.

The hospitals in frontier counties were similar to other non-metropolitan hospitals in the extent to which they offered home health care, but considerably smaller percentages of frontier county hospitals offered hospice services and had inpatient psychiatric units. In particular, only 1.1 percent of hospitals in frontier counties had inpatient psychiatric units in 1992, and the percentage only increased to 1.6 percent by 1998. Only 7.8 percent of frontier county hospitals offered hospice services in 1992, but the percentage increased by 141.0 percent so that, by 1998, an estimated 18.8 percent of hospitals offered hospice services.

Table 3.8
Non-Metropolitan Hospitals Offering Selected Services, by County Category, 1992-1998

County Category	Percentage of Hospitals Providing a Service				Percent Change
	1992	1994	1996	1998	1992-1998
Home health care					
All rural hospitals	46.1%	49.5%	53.9%	58.1%	26.0%
By rural category:					
Adjacent, city 10,000+	53.6	56.8	62.7	66.4	23.9
Adjacent, no city 10,000+	40.6	44.7	48.8	53.5	31.8
Remote, city 10,000+	52.9	56.2	58.5	61.3	15.9
Remote, town 2,500-10,000	45.7	49.5	53.7	57.6	26.0
Remote, no town	42.0	42.9	49.0	54.9	30.7
Frontier counties	41.3	43.0	51.8	57.8	40.0
Hospice services					
All rural hospitals	23.2%	27.4%	33.0%	36.1%	55.6
By rural category:					
Adjacent, city 10,000+	34.8	39.0	42.8	43.8	25.9
Adjacent, no city 10,000+	20.7	26.0	33.4	36.2	74.9
Remote, city 10,000+	32.9	38.2	42.4	43.5	32.2
Remote, town 2,500-10,000	19.9	22.3	28.1	33.0	65.8
Remote, no town	9.9	14.6	19.9	23.4	136.4
Frontier counties	7.8	11.9	15.9	18.8	141.0
Inpatient Psychiatric Unit					
All rural hospitals	12.0%	14.5%	17.4%	20.1%	67.5
By rural category:					
Adjacent, city 10,000+	24.6	30.1	33.1	37.1	50.8
Adjacent, no city 10,000+	7.0	8.9	12.2	13.8	97.1
Remote, city 10,000+	26.6	30.0	33.4	35.7	34.2
Remote, town 2,500-10,000	6.5	8.2	11.4	13.5	107.7
Remote, no town	1.9	2.9	3.6	7.7	305.3
Frontier counties	1.1	1.1	1.1	1.6	45.5

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

HOSPITALS IN RURAL UNDERSERVED AREAS

In this discussion, we examine the distribution of non-metropolitan hospitals, and the services they provide, on the basis of location in areas with shortages of primary care providers, as defined by MUA and HPSA designations. Location in a designated shortage area is not required for hospitals to qualify for any of the Medicare special payment provisions for inpatient services. However, access to care for beneficiaries residing in shortage areas is affected by the extent to which hospitals are located in these areas and the mix of services they offer.

Counts of non-metropolitan hospitals by location in MUA and HPSA counties, reported in Table 3.9, reveal differences in the availability of hospitals in MUAs and HPSAs. In 1997, more than 45 percent of hospitals were located in counties designated as whole county MUAs, whereas only 19 percent of hospitals were located in whole county HPSAs. By comparison, 22 percent of hospitals were in counties with no MUA designation, while close to 40 percent were in counties with no HPSA designation.

Table 3.9
Distribution of All Short-Term Hospitals Located in Non-Metropolitan Counties, by Shortage Area Designation, 1993 and 1997

County Category	1993	1997	Percent Change 1993-1997
All non-metropolitan hospitals	2,319	2,238	-3.5%
By MUA Designation:			
Number of hospitals			
Not MUA	513	499	-2.7
Whole county MUA	1,065	1,020	-4.2
Partial county MUA	741	719	-3.0
Percentage of hospitals			
Not MUA	22.1%	22.3%	0.9
Whole county MUA	45.9	45.6	-0.7
Partial county MUA	32.0	32.1	0.3
By HPSA Designation:			
Number of hospitals			
Not HPSA	976	894	-8.4
Whole county HPSA	462	432	-6.5
Partial county HPSA	881	912	3.5
Percentage of hospitals			
Not HPSA	42.1%	39.9%	-5.2
Whole county HPSA	19.9	19.3	-3.0
Partial county HPSA	38.0	40.8	7.4

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Hospital counts differ from those for county categories because ARF data on MUA and HPSA designations were not available for some counties where hospitals are located, so a small number of hospitals had to be dropped from the analysis.

Differences also are found in trends for the numbers of hospitals between 1993 and 1997. For MUAs, hospital supply in MUAs declined at rates similar to the decline in counties without MUA designation. For HPSAs, hospital supply in partial county HPSAs increased by 3.5 percent while supply in both whole county HPSAs and counties with no HPSA designation decreased (by 6.5 percent and 8.4 percent, respectively). The HPSA designations changed over time, and these

results suggest that counties with partial county HPSAs designated between 1993 and 1997 had more hospitals than counties with previously existing partial-county HPSAs.

For both rural MUAs and HPSAs, hospitals in the whole-county shortage areas had substantially fewer beds, on average, than hospitals in counties with partial-county shortage areas or hospitals in counties with no designation. As shown in Table 3.10, hospitals in whole-county MUAs had an average of 68 Medicare-certified beds in 1993, and they were still bedded at that level in 1997. Bed sizes were yet smaller for whole county HPSAs, where hospitals had an average of 52 certified beds in 1993, which decreased to 49 beds in 1997. Only hospitals in counties with partial county HPSAs diverged from the overall trend of declining bed size between 1993 and 1997, increasing 8 percent from an average of 75 to 81 certified beds.

As discussed above, the average staffing of non-metropolitan hospitals increased visibly over time despite fairly stable levels of certified beds. Within the MUA designations, the highest rate of increase was an 11.1 percent increase in staff FTEs for hospitals in whole-county MUAs. For the HPSA designations, the highest rate was a 15.4 percent staffing increase for hospitals in counties with partial-county HPSAs. Staffing did not increase at hospitals in counties with no HPSA designation, although it increased by 7.5 percent for hospitals in non-MUA counties.

Table 3.10
Average Certified Bed Size and Staffing for Short-Term Hospitals Located in Non-Metropolitan Counties, by Shortage Area Designation, 1993 and 1997

County Category	1993	1997	Percent Change 1993-1997
Average number of beds			
All non-metropolitan hospitals	76	75	-1.3%
By MUA Designation:			
Not MUA	86	81	-5.8
Whole county MUA	68	68	0.0
Partial county MUA	92	90	-2.2
By HPSA Designation:			
Not HPSA	88	82	-6.8
Whole county HPSA	52	49	-5.8
Partial county HPSA	75	81	8.0
Average total staff FTEs			
All non-metropolitan hospitals	224	242	8.0
By MUA Designation:			
Not MUA	254	273	7.5
Whole county MUA	162	180	11.1
Partial county MUA	292	308	5.5
By HPSA Designation:			
Not HPSA	261	262	0.4
Whole county HPSA	115	125	8.7
Partial county HPSA	240	277	15.4

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Beds are Medicare-certified beds. FTEs are full-time equivalent staff employed by a hospital, as reported in the Provider of Service files.

Hospitals in whole county MUAs or whole county HPSAs were less likely than other non-metropolitan hospitals to offer each of the selected services (home health, hospice, and organized inpatient psychiatric units), as shown in Table 3.11. The percentages of hospitals in the whole-county shortage areas that offered these services grew more rapidly from 1993 to 1997, compared to hospitals in counties with partial-county shortage areas or counties with no shortage designations. The growth was so rapid for inpatient psychiatric units that, by 1997, the percentages of hospitals in whole county shortage areas with this service approached percentages in counties with partial-county shortage areas and non-shortage area counties.

Table 3.11
Non-Metropolitan Hospitals Offering Selected Services, by Shortage Area Designation, 1993 and 1997

County Category	Percentage of Hospitals Providing a Service		Percent Change
	1993	1997	1993-1997
Home health care			
All non-metropolitan hospitals	47.5%	56.1%	18.1%
By MUA Designation:			
Not MUA	54.2	63.9	17.9
Whole county MUA	43.0	50.8	18.1
Partial county MUA	49.3	58.3	18.3
By HPSA Designation:			
Not HPSA	52.3	62.8	20.1
Whole county HPSA	41.6	48.1	15.6
Partial county HPSA	45.3	53.4	17.9
Hospice services			
All non-metropolitan hospitals	25.1%	34.9%	39.0%
By MUA Designation:			
Not MUA	32.2	41.7	29.5
Whole county MUA	16.2	25.0	54.3
Partial county MUA	33.1	44.2	33.5
By HPSA Designation:			
Not HPSA	28.9	38.7	33.9
Whole county HPSA	13.6	24.3	78.7
Partial county HPSA	27.0	36.2	34.1
Inpatient Psychiatric Unit			
All non-metropolitan hospitals	13.3%	18.9	42.1%
By MUA Designation:			
Not MUA	16.8	20.2	20.2
Whole county MUA	9.8	17.5	78.6
Partial county MUA	15.9	19.9	25.2
By HPSA Designation:			
Not HPSA	16.1	19.4	20.5
Whole county HPSA	5.2	13.7	163.5
Partial county HPSA	14.4	20.9	45.1

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Section 4.

CHARACTERISTICS OF RURAL HOSPITALS WITH SPECIAL MEDICARE PAYMENT PROVISIONS

Over the years, Federal legislation established a number of special Medicare payment provisions for hospitals located in rural areas, with the goal of helping to retain a supply of viable rural health care hospitals. The special Medicare payment methods reimburse specific types of hospitals more favorably for services to Medicare beneficiaries, where payments under the Prospective Payment System may not be sufficient to cover their costs. Refer to Section 1 for a summary of eligibility requirements and payment methods for these special payment programs.

In this Section, we profile the hospitals in non-metropolitan counties that have qualified for special payments during the 1990s, including the number of hospitals in each payment group, their characteristics, and the types of rural counties in which they are located. Table 4.1 gives basic information on the number of hospitals with each Medicare special payment designation for the years 1992 through 1998, as well as hospitals that are reclassified for an urban wage index for prospective payment calculation. The table also shows the rates of change during this period in the numbers of hospitals with each designation or reclassification. Indian Health Service hospitals are included in this list because the code used to define the special payment designations also identifies these facilities, but we do not focus on them in our comparative analyses. Medicare pays the Indian Health Service hospitals using cost-based reimbursement.

Changes in the number of hospitals with each designation reflect legislative changes regarding each Medicare special payment provision. For example, special payments for Medicare dependent hospitals terminated after March 1993, but was renewed in October 1997. These changes are reflected in counts of these facilities over the 6-year period. In addition, the EACH/PRCH program became operational in the mid-1990s, so hospitals with EACH or EACH/rural referral center designations are found only in 1996 and 1998.[6]

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[6] Refer to footnote #4 regarding RPCHs and MAFs, which are not analyzed separately.

Table 4.1
Number of Hospitals Located in Non-Metropolitan Counties, by Medicare Special Payment Designation, 1992-1998

Hospital Payment Designation	1992	1994	1996	1998	Percent Change 1992-1998
No special designation	1,066	1,485	1,423	1,377	29.2%
Sole community hospital	524	596	621	635	21.2
Rural referral center	189	144	103	95	-49.7
Indian Health Service hospital	33	36	35	35	6.1
SCH/rural referral center	43	36	39	37	-14.0
Medicare dependent hospital	501	4	51	38	-92.4
Essential Access hospital	na	na	4	9	na
EACH/rural referral center	na	na	4	1	na
Other	1	2	8	0	-100.0
Reclassified hospitals	609	691	265	282	-53.7

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Reclassified hospitals are hospitals paid under PPS using wage indices for a nearby MSA.

HOSPITALS WITH SPECIAL PAYMENT DESIGNATIONS

Profiles of the characteristics of non-metropolitan hospitals that received special Medicare payment designations during the 1990s are explored in this analysis. We examine the same characteristics considered for all hospitals in Section 3: ownership, service capacity as measured by bed counts and total staffing, and provision of selected services.

Trends in hospital ownership mix by Medicare payment designation are presented in Table 4.2 for the major groups of special payment hospitals. Within each hospital group, we report the percentages of hospitals by type of ownership, which sum to 100 percent across each row in the table. We excluded EACHs and EACH/rural referral centers because there are few hospitals in these two groups. Indian Health Service hospitals also are excluded because they are federal government facilities that did not vary in ownership over time.

Substantial differences are found among the hospital special payment groups in mix of ownership. Overall, rural referral centers and SCH/rural referral centers have similar ownership mix, which differ in several ways from the ownership of the other hospital groups. Larger percentages of hospitals in these two groups are not-for-profit facilities, and smaller percentages are owned by a local government or a hospital district or authority. Furthermore, these are the

only groups for which the percentage of for-profit ownership increased between 1992 and 1998, accompanied by a marked decline in the percentage of hospitals owned by local governments. For the SCH/rural referral centers, the percentage of not-for-profit hospitals also declined.

As discussed in Section 3, growing percentages of non-metropolitan hospitals were owned by hospital districts or authorities during the 1990s. Based on the information in Table 4.2, this ownership shift appeared to have occurred primarily for the sole community hospitals, SHC/rural referral centers, and Medicare dependent hospitals.

Table 4.2
Distributions of Ownership of Non-Metropolitan Hospitals, by Medicare Special Payment Designation, 1992-1998

Payment Designation and Year	Percentage of Hospitals by Type of Ownership				
	Voluntary not-for-profit	For-profit	Government-federal, state	Government-local	Hospital. district, authority
No special payment hospitals					
1992	46.1	10.1	1.4	23.6	18.8
1995	48.5	9.3	1.1	23.0	18.2
1998	48.3	8.4	0.8	24.2	18.3
Sole community hospitals					
1992	51.9	4.2	1.7	22.0	20.2
1995	48.9	3.5	1.7	22.3	23.6
1998	49.0	3.8	1.3	22.4	23.6
Rural referral centers					
1992	69.8	6.9	0.5	14.3	8.5
1995	68.2	11.5	0.6	13.4	6.4
1998	67.4	12.6	1.1	10.5	8.4
SCH/rural referral centers					
1992	76.7	4.7	0	11.6	7.0
1995	70.9	9.1	0	12.7	7.3
1998	70.3	10.8	0	8.1	10.8
Medicare dependent hospitals					
1992	42.3	4.6	0.2	33.5	19.4
1995	41.4	5.5	0.7	33.0	19.4
1998	47.4	2.6	0	26.3	23.7

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: The percentages sum to 100 percent across each row.

Differences in hospital capacity across the hospital special payment groups, presented in Table 4.3, are consistent with the types of payment designations. Rural referral centers and SCH/rural referral centers have much larger capacities, measured by either the average number of

beds or total staffing, as compared with other non-metropolitan hospitals including hospitals with no special designation (the "no special payment" group). Sole community hospitals, Indian Health Service hospitals, and Medicare dependent hospitals have smaller capacities than hospitals with no special designation. There was little change in average number of beds for any of the hospital groups between 1992 and 1998, but the groups did vary in the size of increases in average total staff FTEs. The SCH/rural referral centers had a 38.5 percent increase in staffing, the largest increase of all the groups. By contrast, staffing at Indian Health Service hospitals increased by only 2.9 percent.

Table 4.3
Average Certified Bed Size and Staffing for Short-Term Hospitals in Non-Metropolitan Counties, by Medicare Special Payment Designation, 1992-1998

Hospital Payment Designation	1992	1994	1996	1998	Percent Change 1992-1998
Average number of beds					
No special designation	71	66	70	71	0.0%
Sole community hospital	54	56	56	58	7.4
Rural referral center	221	226	223	221	0.0
Indian Health Service hospital	42	41	41	41	-2.4
SCH/rural referral center	211	223	210	214	1.4
Medicare dependent hospital	42	65	38	38	-9.5
Essential Access hospital	na	na	115	121	
Average total staff FTEs					
No special designation	184	179	208	215	16.8%
Sole community hospital	159	185	189	204	28.3
Rural referral center	744	772	797	925	24.3
Indian Health Service hospital	136	141	140	140	2.9
SCH/rural referral center	749	851	1,055	1,037	38.5
Medicare dependent hospital	92	179	87	92	0.0
Essential Access hospital	na	na	342	398	

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Beds are certified beds. FTEs are full-time equivalent staff employed by a hospital, as reported in the Provider of Service files.

In addition to having substantial service capacity, the rural referral centers and SCH/rural referral centers were more likely than other non-metropolitan hospitals to offer home health care, hospice services, and inpatient psychiatric units during the 1990s, as reported in Table 4.4. The SCH/rural referral centers introduced home health and hospice services later than the rural referral centers that were not SCHs, as shown by the noticeably higher percentages of rural

referral centers offering these services in 1992. By 1998, the percentages offering the services were similar for the two groups. On the other hand, larger percentages of the SCH/rural referral centers had inpatient psychiatric units in 1992, compared with rural referral centers. Percentages of hospitals with psychiatric units increased for both groups between 1992 and 1998 at similar rates, with the result that differences between them did not change over time.

Table 4.4
Non-Metropolitan Hospitals Offering Selected Services, by Medicare Special Payment Designation, 1992-1998

	Percentage of Hospitals Providing a Service				Percent Change
Hospital Payment Designation	1992	1994	1996	1998	1992-1998
Home health care					
No special designation	42.3%	46.1%	50.6%	55.3%	30.7%
Sole community hospital	49.4	53.3	58.4	62.8	27.1
Rural referral center	67.2	66.7	70.9	73.7	9.7
Indian Health Service hospital	39.4	36.1	37.1	37.1	-5.8
SCH/rural referral center	48.8	69.4	74.4	70.3	44.1
Medicare dependent hospital	43.1	50.0	49.0	47.4	10.0
Essential Access hospital	na	na	75.0	66.7	
Hospice services					
No special designation	22.9%	25.8%	32.9%	35.7%	55.9%
Sole community hospital	20.2	24.8	30.6	35.0	73.3
Rural referral center	49.2	53.5	51.5	57.9	17.7
Indian Health Service hospital	6.1	11.1	11.4	11.4	86.9
SCH/rural referral center	39.5	52.8	59.0	56.8	43.8
Medicare dependent hospital	17.0	25.0	21.6	15.8	-7.1
Essential Access hospital	na	na	0.0	33.3	
Psychiatric Unit					
No special designation	9.9%	11.4%	16.0%	19.2%	93.9%
Sole community hospital	8.4	10.2	12.1	13.9	65.5
Rural referral center	48.1	52.8	59.2	63.2	31.4
Indian Health Service hospital	0.0	0.0	0.0	0.0	0.0
SCH/rural referral center	55.8	75.0	69.2	73.0	30.8
Medicare dependent hospital	3.8	25.0	7.8	15.8	315.8
Essential Access hospital	na	na	25.0	11.1	

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

For hospitals with no special payments, sole community hospitals, and Medicare dependent hospitals, there was rapid growth in the percentage of hospitals providing home health care, hospice services, and inpatient psychiatric units between 1992 and 1998. However, this growth only partially closed the gap with the percentages of rural referral centers that offered

these services. In particular, very small percentages of hospitals in these three groups had psychiatric units in 1992, so that even after rapid rates of increase, the percentages with psychiatric units in 1998 were still modest.

HOSPITALS RECLASSIFIED FOR URBAN WAGE INDEX

Reclassification of non-metropolitan hospitals to allow them to be paid on the basis of an urban wage index is another important special payment provision for these facilities.[7] According to data in the Provider Specific Files, 25.8 percent of all non-metropolitan hospitals were reclassified in 1992, and the percentages declined to 12.2 percent in 1995 and 12.7 percent in 1998, as shown in Table 4.5. By 2000, 21.1 percent of hospitals had wage index reclassifications (refer to Table 1.2), a substantial increase from the intervening years. The reason(s) for declines in reclassifications are not clear.

Table 4.5
Non-Metropolitan Hospitals Reclassified for Urban Wage Index, by County Category, 1992-1998

	Number of Reclassified Hospitals			Percent of Hospitals in Category		
County Category	1992	1995	1998	1992	1995	1998
All non-metropolitan hospitals	609	280	282	25.8%	12.2%	12.7%
By county category:						
Adjacent, city 10,000+	192	105	105	48.7	27.3	28.2
Adjacent, no city 10,000+	193	71	59	28.9	10.9	9.3
Remote, city 10,000+	118	64	73	33.7	18.9	22.1
Remote, town 2,500-10,000	87	33	37	13.7	5.3	6.1
Remote, no town	19	7	8	6.1	2.3	2.8
Frontier counties	29	12	7	10.3	4.3	2.7

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Reclassified hospitals are hospitals paid under PPS using wage indices for a nearby MSA. These do not include hospitals that were reclassified for standardized amount.

[7] We did not perform a similar analysis for hospitals reclassified for standardized amount because, as of FY1995, rural hospitals and "other urban" hospitals were paid on the basis of the same standardized amount. This reduced the need for special classification to obtain a more favorable payment, although according to HCFA records (65 FR, August 1, 2000), some hospitals continue to be reclassified to obtain the higher urban standardized amount. Wage index reclassifications remain an important policy issue for non-metropolitan hospitals.

Rates of wage index reclassifications vary by category of non-metropolitan county. As expected, given the design of the reclassification policy, the largest percentages of reclassified hospitals are in counties adjacent to MSAs and remote counties containing a city of 10,000 population. Only small percentages of hospitals in the more remote counties or frontier counties are reclassified.

The number and percentages of non-metropolitan hospitals with wage index reclassifications are reported in Table 4.6, listed by special payment designation. Declines in reclassification rates between 1992 and 1995 are found for all hospital groups. Rural referral centers and SCH/rural referral centers had the largest percentages of reclassifications in 1992, 1995, and 1998. An estimated 70.9 percent of rural referral centers were reclassified in 1992, decreasing to 46.3 percent in 1998. Somewhat smaller percentages are found for the SCH/rural referral centers. For hospitals with no special designation, 25.4 percent had wage index reclassifications in 1992, declining to 12.4 percent in 1998. Sole community hospitals had a similar reclassification rate of 22.0 percent in 1992, but the percentage declined more sharply to 8.7 percent by 1998.

Regional differences in wage index reclassifications for non-metropolitan hospitals were moderate, as shown in Table 4.7. In 1992, reclassification rates ranged from 15.9 percent (Denver region) to 38.0 percent (Chicago region). Similar ranges in rates occurred in 1995 and 1998, although at substantially lower percentages of reclassification. The Boston and New York regions experienced the sharpest decline in reclassification rates between 1992 and 1998. By contrast, only the Denver region saw little decline in reclassification rates during that period.

Table 4.6
Non-Metropolitan Hospitals Reclassified for Urban Wage Index, by Medicare Special Payment Designation, 1992-1998

	Number of Reclassified Hospitals			Percentage of Hospitals in Group		
Hospital Payment Designation	1992	1995	1998	1992	1995	1998
No special designation	271	139	170	25.4%	13.4%	12.4%
Sole community hospital	115	46	55	22.0	7.6	8.7
Rural referral center	134	60	44	70.9	38.2	46.3
Indian Health Service hospital	0	0	0	0	0	0
SCH/rural referral center	27	18	11	62.8	32.7	29.7
Medicare dependent hospital	61	17	0	12.2	4.2	0

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Reclassified hospitals are hospitals paid under PPS using wage indices for a nearby MSA. Reclassifications for EACHs and EACH/rural referral centers are not reported because the number of hospitals in each group is small.

Table 4.7
Non-Metropolitan Hospitals Reclassified for Urban Wage Index, by HHS Region, 1992-1998

	Number of Reclassified Hospitals			Percentage of Hospitals in Group		
HHS Region	1992	1995	1998	1992	1995	1998
1. Boston	18	4	4	27.7%	6.3%	6.5%
2. New York	16	5	3	37.2	12.8	8.3
3. Philadelphia	38	15	18	28.8	11.4	14.4
4. Atlanta	132	69	77	26.0	14.0	15.8
5. Chicago	158	64	63	38.0	16.0	16.1
6. Dallas	94	51	47	24.2	13.3	12.6
7. Kansas City	60	29	21	17.0	8.4	6.5
8. Denver	37	26	29	15.9	11.6	13.7
9. San Francisco	21	8	11	23.6	8.9	12.5
10. Seattle	35	9	9	27.1	7.1	7.2

SOURCE: Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Reclassified hospitals are hospitals paid under PPS using wage indices for a nearby MSA.

Section 5.

INPATIENT UTILIZATION AND SPENDING FOR NON-METROPOLITAN HOSPITALS

This section presents trends in Medicare fee-for-service inpatient stays for non-metropolitan hospitals, using Medicare Part A claims data. We describe utilization and spending trends during the 1990s for inpatient hospital stays in non-metropolitan facilities, to gain an understanding of how Medicare utilization and spending for these facilities may have changed over time. The number of inpatient stays, lengths of stay, total spending, and Medicare spending are tracked for selected calendar years. Distributions of inpatient stays for non-metropolitan hospitals also are provided by the most common DRGs, Medicare eligibility status, source of admission, and discharge destination. In Section 6, we describe inpatient utilization for rural Medicare beneficiaries residing in non-metropolitan counties, and associated spending, including examination of use of rural and urban facilities and rural hospitals with special designations.

TOTAL INPATIENT STAYS

We begin by reporting the total Medicare inpatient stays for non-metropolitan hospitals and examining how those hospital stays are distributed by county category, by Medicare payment designation, and by payment designation with county category. As shown in Table 5.1, non-metropolitan hospitals provided services for more than 2.1 million Medicare inpatient stays in 1992, which increased to 2.4 million stays in 1998. Approximately half of these stays were provided by hospitals in the two county categories adjacent to MSAs. Another quarter of the stays were provided by hospitals in remote counties that contained a city of 10,000 population. These distributions remained steady from 1992 to 1998.

From Table 5.2, we find that the distributions of Medicare inpatient stays at non-metropolitan hospitals shifted over time across hospital categories by special Medicare payment designation. Between 1992 and 1998, inpatient stays at hospitals without special payment designation increased from 41.1 percent to 56.5 percent of total stays. At the same time, the share of inpatient stays served by rural referral centers increased from 15.0 percent to 20.6 percent of total stays, while the share for sole community providers declined from 26.8 percent to

15.0 percent. Hospitals that were designated as both sole community hospitals and rural referral centers accounted for only 5.7 percent of the stays provided by non-metropolitan hospitals, a percentage that remained steady from 1992 to 1998.

Table 5.1
Percentage Distribution of Inpatient Stays for Non-Metropolitan Hospitals, by County Categories, 1992-1998

	1992	1994	1996	1998
All Inpatient Stays	2,139,863	2,246,213	2,346,815	2,397,450
By county category:				
Adjacent, city 10,000+	28.5%	28.3%	28.4%	28.2%
Adjacent, no city 10,000+	21.7	21.7	21.7	21.4
Remote, city 10,000+	26.6	26.7	26.8	27.1
Remote, town 2,500-10,000	18.7	18.7	18.6	18.7
Remote, no town	4.5	4.5	4.5	4.6
Frontier counties	2.8	2.9	2.8	2.8

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Table 5.2
Inpatient Stays for Non-Metropolitan Hospitals, by Medicare Payment Designation, 1992-1998

	1992	1994	1996	1998
All Inpatient Stays	2,139,863	2,246,213	2,346,815	2,397,450
By hospital payment designation:				
No special designation	41.1%	54.6%	57.2%	56.5%
Sole Community Hospital	15.0	18.3	19.2	20.6
Rural referral center	26.8	21.6	15.9	15.0
Indian Health Service	0.2	0.3	0.28	0.3
SCH and RRC	5.7	5.0	5.5	5.7
Medicare-dependent hospital	11.0	0.1	0.9	0.7
EACH	n/a	n/a	0.3	0.7
EACH/Referral center	n/a	n/a	0.5	0.3

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

The mix of types of non-metropolitan hospitals utilized by Medicare beneficiaries for inpatient services varied widely across categories of hospital county locations. Percentage distributions of inpatient stays by hospital payment designation and county category are reported in Table 5.3, presenting a separate distribution for each of the five county categories and for frontier counties. The strongest result is observed for frontier counties, where in 1992, sole

community hospitals accounted for 68.3 percent of inpatient stays provided by hospitals located in frontier counties, and only 16.3 percent of stays were provided by hospitals with no special designation. Percentages for 1998 were similar.

Table 5.3
Percentage Distribution of Inpatient Stays for Non-Metropolitan Hospitals, by Hospital Location and Medicare Payment Designation, 1992 & 1998

	Non-Metro Category for Hospital County Location					
Hospital Payment Designation	Adjacent, city	Adjacent, no city	Remote, city	Remote, town	Remote, no town	Frontier County
1992						
Non-special designation	42.8%	52.2%	25.4%	49.8%	32.6%	16.3%
Sole Community Hospital	8.6	14.1	12.1	25.0	34.9	68.3
Rural referral center	37.0	12.0	47.0	6.2	0	0
Indian Health Service	0.2	0.1	0.3	0.3	1.0	2.7
SCH and RRC	6.5	1.9	11.6	1.6	0	2.5
Medicare-dependent hospital	4.8	18.6	3.5	17.1	30.6	9.8
1998						
Non-special designation	63.4%	69.2%	37.5%	59.5%	55.4%	15.7%
Sole Community Hospital	12.9	19.7	18.9	31.3	39.1	74.2
Rural referral center	17.7	9.3	26.9	3.7	0.0	0.0
Indian Health Service	0.2	0.1	0.4	0.5	0.9	4.3
SCH and RRC	5.0	1.1	13.6	1.8	0.0	0.0
Medicare-dependent hospital	0.4	0.1	0.7	1.1	3.7	4.3

SOURCE: MEDPAR data for the 100 percent beneficiary population Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Columns sum to 100 percent for each rural geographic designation and for frontier counties.

Within the different categories of non-metropolitan counties, shifts in shares of inpatient stays between sole community providers and rural referral centers occurred between 1992 and 1998. In 1992, sole community hospitals accounted for important percentages of total inpatient stays for hospitals in the more remote counties, but for much smaller shares of stays for hospitals in counties with cities or adjacent to an MSA. By contrast, rural referral centers had larger shares of inpatient stays among hospitals in counties that contained at least one city of 10,000 population. By 1998, use of sole community hospitals had increased, relative to other types of hospitals, in all of the five county categories, as measured by the percentages of total inpatient stays provided by sole community hospitals. At the same time, percentages declined for rural referral centers.

Individuals are eligible for Medicare benefits not only if they are age 65 or older, but also if they are younger than 65 and permanently disabled or have end stage renal disease (ESRD). We examined the extent to which each of these groups is represented in the inpatient stays provided by non-metropolitan hospitals, the results of which are given in Table 5.4. Overall, for all non-metropolitan hospitals, the percentage of inpatient stays attributable to disabled beneficiaries increased from 9.8 percent in 1992 to 12.2 percent in 1998, and the percentage for ESRD beneficiaries went from 1.1 percent in 1992 to 1.3 percent in 1998. Slightly larger percentages of inpatient stays at rural referral centers are for both disabled and ESRD beneficiaries, whereas percentages are slightly smaller for sole community hospitals. These differences occur for all three years reported in the table.

Table 5.4
Inpatient Utilization of Non-Metropolitan Hospitals by Disabled and ESRD Medicare Beneficiaries, by Medicare Payment Designation, 1992, 1995 & 1998

	Stays for Disabled or ESRD Beneficiaries As a Percentage of Total					
	1992		1995		1998	
Hospital Payment Designation	Disabled	ESRD	Disabled	ESRD	Disabled	ESRD
All inpatient stays	9.8%	1.1%	11.3%	1.3%	12.2%	1.3%
By hospital payment designation						
No special designation	10.3%	0.8%	11.9	1.0	12.4	1.0
Sole Community Hospital	8.5	0.8	9.9	0.8	10.9	1.0
Rural referral center	10.8	2.0	12.2	2.4	13.0	2.4
Indian Health Service	11.4	5.3	15.6	6.3	16.2	5.2
SCH and RRC	10.0	1.9	11.8	1.9	13.2	2.0
Medicare-dependent hospital	7.1	0.3	8.4	0.3	7.4	0.2
EACH	na	na	na	na	12.1	0.4
EACH/Referral center	na	na	na	Na	12.5	2.1

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: ESRD category includes all ESRD beneficiaries, including those who also are aged or disabled.

UTILIZATION BY TYPE OF INPATIENT STAY

In the following tables, we explore how non-metropolitan hospitals with special Medicare payment designations may differ according to several measures of the delivery of inpatient services. First we compare the hospital groups according to source of admission, type of

admission, and discharge destination.[8] Then we look at differences in case mix, as measured by the DRGs used to establish PPS payments for the inpatient services provided.

Percentage distributions of Medicare inpatient stays by source of admission for 1992 and 1998 are presented in Table 5.5, comparing hospitals with no special designation, sole community hospitals, rural referral centers, SCH/RRCs, and Medicare dependent hospitals. Although some obvious differences in trends are observed for the different types of hospitals, we are cautious in interpreting these trends because they may be due to data accuracy and coding changes as much as (or more than) to actual changes in practices.

Table 5.5
Distributions of Inpatient Stays for Non-Metropolitan Hospitals, by Source of Admission and Medicare Payment Designation, 1992 and 1998

Source of Admission	No Special Designation	Sole Community Hospital	Rural Referral Center	SCH and RRC	Medicare Dependent Hospital
1992					
Physician referral	47.1%	44.4%	47.0%	46.7%	49.0%
Clinic referral	1.1	1.6	2.0	2.4	3.1
Transfer from another hospital	0.4	0.4	2.0	2.4	0.4
Emergency room	48.8	52.0	45.7	46.5	43.8
Other	2.2	1.5	2.8	1.4	3.6
Information not available	0.3	0.1	0.6	0.7	0.1
1998					
Physician referral	45.1%	20.1%	15.1%	41.2%	53.6%
Clinic referral	1.5	14.5	22.0	1.5	2.3
Transfer from another hospital	1.0	13.0	31.1	3.2	0.3
Emergency room	50.6	53.2	47.2	51.9	40.1
Other	1.7	1.5	2.5	2.2	3.8
Information not available	0.1	<0.0	0.1	<0.0	<0.1

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

In 1992, physician referrals and the emergency room were the most important sources of admissions for all hospital designations, together accounting for greater than 95 percent of hospital stays. By 1998, however, the percentage of referrals from physicians appeared to decline

[8] HCFA staff caution that data for the sources and types of admissions on the Medpar claims are not as accurate as other data elements on these records, especially during the early 1990s. In addition, coding changes have been made for these data elements during the time period of this study.

for sole community hospitals and rural referral centers, accompanied by increases for clinic referrals and transfers from other hospitals. In particular, for rural referral centers, reported transfers from other hospitals rose from 2.0 percent of total stays in 1992 to 31.1 percent of stays in 1998. It is not clear whether these differences are real or the result of changes in coding on the inpatient claims. Some of the change may be due to increased referrals to EACHs from RPCHs.

Modest differences are found in the mix of inpatient stays by type of admission for non-metropolitan hospitals with different payment designations, according to percentage distributions given in Table 5.6. Medicare dependent hospitals differed from the other hospital designations, where urgent admissions were larger percentages of their total inpatient stays and emergency and elective admissions were lower percentages. These differences were found in both 1992 and 1998, even though this designation was discontinued and re-introduced in the intervening years. Within each payment designation category, there was little change in distributions of stays by type of admission between 1992 and 1998.

Table 5.6
Distributions of Inpatient Stays for Non-Metropolitan Hospitals, by Type of Admission and Medicare Payment Designation, 1992 and 1998

Type of Admission	No Special Designation	Sole Community Hospital	Rural Referral Center	SCH and RRC	Medicare Dependent Hospital
1992					
Emergency	45.1%	43.8%	44.4%	45.2%	34.8%
Urgent	41.5	41.8	35.4	35.2	53.1
Elective	13.2	14.3	20.1	19.3	11.9
Not known	0.2	0.1	0.1	0.0	0.2
1998					
Emergency	45.1%	43.9%	42.0%	44.9	20.4%
Urgent	36.9	37.9	33.7	32.4	51.8
Elective	17.8	17.9	23.5	22.7	22.9
Not known	0.2	0.2	0.8	<0.1	5.0

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

In Table 5.7, we present distributions of inpatient stays for non-metropolitan hospitals according to discharge destination, again comparing distributions for hospitals with different payment designations. The majority of discharges from hospitals with all designations in both 1992 and 1998 were to home or self care. However, a shift occurred between 1992 and 1998

toward larger percentages of inpatient stays discharged to a skilled nursing facility, and a similar but smaller shift was found for discharges to a home health agency. These changes cut across all hospital groups. Medicare dependent hospitals differed from hospitals with other payment designations, in that relatively more of their discharges went to skilled nursing or intermediate care facilities.

Table 5.7
Distributions of Inpatient Stays for Non-Metropolitan Hospitals, by Discharge Destination and Medicare Payment Designation, 1992 & 1998

Discharge Destination	No Special Designation	Sole Community Hospital	Rural Referral Center	SCH and RRC	Medicare Dependent Hospital
1992					
Home/self care	62.3%	63.3%	66.9%	66.6%	57.2%
Other short term hospital	6.1	6.4	3.5	3.8	7.1
Skilled nursing facility	10.1	10.6	8.4	8.8	11.7
Intermediate care facility	5.4	5.5	4.5	3.4	9.9
Another institution	1.8	1.5	2.4	2.5	1.5
Home health agency	8.1	6.5	8.1	8.8	6.3
Died	5.6	5.5	5.8	5.5	5.7
Other	0.6	0.6	0.6	0.6	0.5
1998					
Home/self care	56.9%	57.5%	58.8%	60.4%	53.3%
Other short term hospital	6.4	6.9	3.5	4.3	6.9
Skilled nursing facility	15.8	15.3	14.8	13.5	23.6
Intermediate care facility	5.1	4.9	3.5	3.0	9.8
Another institution	2.9	2.3	3.7	4.1	0.9
Home health agency	8.2	8.3	10.7	9.7	1.7
Died	4.4	4.3	4.6	4.4	3.7
Other	0.5	0.4	0.4	0.5	0.3

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

In the next two tables, we summarize the average case mix for inpatient stays at non-metropolitan hospitals. Table 5.8 gives average DRG weights for hospitals grouped by non-metropolitan county category. Hospitals in the two county categories with a city of 10,000 population have the highest case mix, with average DRG weights exceeding 1.20. Case mix is more moderate for hospitals in counties adjacent to an MSA without a city (1.13 in 1992) and in remote counties with a town (1.11 in 1992). Hospitals in the more remote counties and frontier

counties have the lowest DRG weights (1.01 and 1.04 in 1992, respectively). Although case mix for non-metropolitan hospitals rose between 1992 and 1998, the size of increase was small.

Overall case mix for non-metropolitan hospitals remained steady from 1992 to 1998 at an average DRG weight close to 1.20, as shown in Table 5.8. However, case mix varied across hospitals with different Medicare payment designations, as shown in Table 5.9. Rural referral centers had the highest case mix, with average DRG weights of 1.32 in 1992 and 1.41 in 1998. Hospitals that were both SCHs and rural referral centers had similarly high average DRG weights Sole community hospitals had average DRG weights similar to those for hospitals for no special designation. Medicare dependent hospitals and Indian Health Service hospitals had the lowest average case mix. Average DRG weights increased over time only for the rural referral centers and SCH/rural referral centers.

Table 5.8
Average DRG Weights for Non-Metropolitan Hospitals, by County Category and Frontier County Status, 1992-1998

County Category	1992	1994	1996	1998
All non-metropolitan hospitals	1.19	1.20	1.23	1.21
By county category				
Adjacent, city 10,000+	1.23	1.24	1.27	1.25
Adjacent, no city 10,000+	1.13	1.14	1.17	1.15
Remote, city 10,000+	1.27	1.29	1.33	1.32
Remote, town 2,500-10,000	1.11	1.11	1.15	1.12
Remote, no town	1.01	1.02	1.03	1.05
Frontier counties	1.04	1.05	1.07	1.05

SOURCE: MEDPAR data for the 100 percent beneficiary population and Medicare DRG weight files, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Table 5.9
Average DRG Weights for Non-Metropolitan Hospitals, by Medicare Payment Designation, 1992-1998

Medicare Payment Designation	1992	1994	1996	1998
No special designation	1.14	1.15	1.19	1.17
Sole Community Hospital	1.14	1.15	1.18	1.16
Rural referral center	1.32	1.35	1.42	1.41
Indian Health Service	0.98	0.96	0.98	0.99
SCH and RRC	1.31	1.33	1.34	1.34
Medicare-dependent hospital	1.07	1.16	1.09	1.05
EACH	na	na	1.14	1.13
EACH/Referral center	na	na	1.31	1.26

SOURCE: MEDPAR data for the 100 percent beneficiary population and Medicare DRG weight files, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

SPENDING ON INPATIENT CARE AT NON-METROPOLITAN HOSPITALS

The utilization data discussed above translate into total spending and Medicare spending for inpatient care provided by non-metropolitan hospitals to Medicare beneficiaries. Total spending we report here is the amount received by a hospital, which is the sum of the amounts paid by Medicare, any primary payer, and the beneficiary for a hospital inpatient stay. The Medicare amount includes only the portion of the total payment for which Medicare was liable.

In Table 5.10, we report the average total spending and Medicare spending per inpatient stay for hospitals located in non-metropolitan counties, comparing average payments across categories of counties. Overall, total spending increased from $4,624 per stay in 1992 to $5,097 per stay in 1998, a 10 percent increase. Medicare spending also increased over time, remaining close to 87 percent of total spending in each year. Of note, there was a discrete shift upward in average payments between 1994 and 1996, reflecting the final phase-out of a separate, lower standardized payment amount for hospitals in non-metropolitan counties.

Table 5.10
Average Total Spending and Medicare Spending per Inpatient Stay for Beneficiaries at Non-Metropolitan Hospitals, by County Category, 1992-1998

County Category	1992	1994	1996	1998
Total Spending per Stay				
All non-metropolitan hospitals	$4,624	$4,674	$5,040	$5,087
By county category				
Adjacent, city 10,000+	$4,989	$5,056	$5,364	5,341
Adjacent, no city 10,000+	4,387	4,441	4,678	4,678
Remote, city 10,000+	5,044	5,124	5,604	5,714
Remote, town 2,500-10,000	4,023	4,013	4,438	4,434
Remote, no town	3,503	3,466	3,866	4,409
Frontier counties	4,060	4,124	4,417	4,542
Medicare Spending per Stay				
All non-metropolitan hospitals	$4,034	$4,065	$4,415	$4,436
By county category				
Adjacent, city 10,000+	4,384	4,429	4,720	4,675
Adjacent, no city 10,000+	3,825	3,855	4,077	4,068
Remote, city 10,000+	4,419	4,489	4,951	5,022
Remote, town 2,500-10,000	3,455	3,430	3,839	3,805
Remote, no town	2,980	2,919	3,306	3,809
Frontier counties	3,522	3,570	3,838	3,949

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Average Medicare spending per inpatient stay can be expected to vary across hospitals with different special payment designations because each type of hospital serves a unique role in delivering health care for rural areas. Medicare spending per stay, reported in Table 5.11, is higher than average for rural referral centers and SCH/rural referral centers, and lower than average for sole community hospitals and Medicare dependent hospitals. We also report estimates of average standardized spending per inpatient stay, based on a DRG weight equal to 1.0. The overall standardized spending was lower than actual average spending, reflecting the downward adjustment from an average DRG weight of 1.20 to 1.00. Case mix was an important source of spending variation across hospital groups with special Medicare designations, as shown by the much smaller variation in standardized spending per stay compared to actual spending, as well as by the ratios in average spending relative to hospitals with no special designation.

Table 5.11
Average Medicare Spending per Inpatient Stay for Non-Metropolitan Hospitals, Actual and Standardized for DRG weight=1, by Medicare Payment Designation, 1992-1998

Medicare Payment Designation	Average Medicare Spending per Stay				Spending Ratios*
	1992	1994	1996	1998	
Actual Spending per Stay					
No special designation	$3,649	$3,663	$4,109	$4,130	1.00
Sole Community Hospital	3,887	3,966	4,303	4,358	1.06
Rural referral center	4,811	4,904	5,366	5,379	1.30
Indian Health Service hospital	3,861	4,210	4,441	4,582	1.11
SCH and RRC	5,034	5,216	5,383	5,439	1.32
Medicare-dependent hospital	3,258	4,371	3,327	3,623	0.88
Standardized Spending per Stay (DRG weight=1)					
No special designation	$3,201	$3,185	$3,453	$3,530	1.00
Sole Community Hospital	3,410	3,449	3,647	3,757	1.06
Rural referral center	3,645	3,633	3,779	3,815	1.08
Indian Health Service hospital	3,940	4,385	4,532	4,628	1.31
SCH and RRC	3,843	3,922	4,017	4,059	1.15
Medicare-dependent hospital	3,045	3,768	3,052	3,450	0.98
All non-metropolitan hospitals	3,390	3,388	3,589	3,666	1.04

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File.

NOTE: Standardized Medicare spending per stay was calculated as a weighted average, where the weight was the inverse of the DRG weight for each stay.

* Ratio of average payment per stay for each hospital designation to "no special designation" hospitals

Section 6.

INPATIENT UTILIZATION AND SPENDING FOR MEDICARE BENEFICIARIES IN NON-METROPOLITAN COUNTIES

The perspective taken for analyses presented in this section is that of the Medicare beneficiaries. All measures are calculated on the basis of the state and county of residence for beneficiaries who lived in non-metropolitan counties. This population-based approach is intended to gain a better understanding of the extent to which rural beneficiaries utilize inpatient services, where they obtain those services (hospital type, urban versus rural), and how utilization and spending vary across beneficiaries living in counties with differing levels of hospital supply in the county or in near proximity.

Average rates of hospitalization and lengths of stay for beneficiaries in non-metropolitan counties are summarized in Table 6.1. Overall, there were 333 inpatient stays per 1,000 beneficiaries in 1992, which increased to 348 inpatient stays in 1998. On the other hand, average length of stay declined from 7.3 days to 5.6 days during this period.

Table 6.1
Hospitalization Rate and Average Length of Stay for Medicare Beneficiaries Residing in Non-Metropolitan Counties, by County Category, 1992-1998

	1992		1994		1996		1998	
	Hospital Rate	LOS	Hospital Rate	LOS	Hospital Rate	LOS	Hospital Rate	LOS
All Non-Metropolitan Beneficiaries	333	7.3	343	6.6	345	5.9	348	5.6
By county category:								
Adjacent, city 10,000+	323	7.6	331	6.8	335	6.0	335	5.7
Adjacent, no city 10,000+	335	7.4	341	6.7	344	5.9	345	5.6
Remote, city 10,000+	322	7.5	332	6.8	333	6.1	340	5.7
Remote, town 2,500-10,000	343	7.0	360	6.3	359	5.7	367	5.4
Remote, no town	352	6.9	367	6.2	370	5.6	374	5.3
Frontier counties	316	6.3	319	5.7	319	5.2	324	4.9

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Hospitalization rates are measured as number of inpatient stays per 1,000 Medicare beneficiaries residing in non-metropolitan counties. LOS is the length of stay in days.

Hospitalization rates did not vary much across counties of differing degrees of rurality. For example, rates ranged from 322 to 352 stays per 1,000 beneficiaries in 1992 (a difference that

is 9 percent of the average), and similar differences occurred in later years. Of note, beneficiaries living in the two categories of non-metropolitan counties with a city of 10,000 have somewhat lower inpatient utilization rates than those living in less urbanized counties.

The average total per capita spending for inpatient stays by beneficiaries in non-metropolitan counties, summarized in Table 6.2, increased from $1,881 per beneficiary in 1992 to $2,234 per beneficiary. Medicare spending per capita was a stable 89 percent of total spending for all years during the time period we examined. Differences in per capita spending for inpatient care across county categories were not large, nor were they consistent on the basis of their degree of rurality. For example, per capita spending for beneficiaries in the most remote non-metropolitan counties was lower than spending for beneficiaries in more urbanized counties in 1992, but it was higher in 1998.

Table 6.2
Total and Medicare Spending per Capita on Inpatient Hospital Services for Beneficiaries Residing in Non-Metropolitan Counties, by County Category, 1992-1998

	1992	1994	1996	1998
Total Spending per Stay				
All Beneficiaries	$1,881	$1,993	$2,180	$2,234
By county category:				
Adjacent, city 10,000+	1,931	2,047	2,210	2,224
Adjacent, no city 10,000+	1,919	2,017	2,209	2,255
Remote, city 10,000+	1,807	1,910	2,103	2,189
Remote, town 2,500-10,000	1,843	1,980	2,167	2,243
Remote, no town	1,842	1,956	2,190	2,265
Frontier counties	1,782	1,869	2,038	2,106
Medicare Spending per Stay				
All Beneficiaries	$1,667	$1,766	$1,948	$1,989
By county category:				
Adjacent, city 10,000+	1,718	1,820	1,979	1,986
Adjacent, no city 10,000+	1,704	1,791	1,979	2,014
Remote, city 10,000+	1,596	1,686	1,871	1,944
Remote, town 2,500-10,000	1,626	1,745	1,933	1,989
Remote, no town	1,629	1,727	1,952	2,015
Frontier counties	1,585	1,663	1,822	1,887

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Spending is measured as total spending or Medicare spending per Medicare beneficiary residing in the relevant non-metropolitan counties.

Estimated spending per inpatient stay for beneficiaries in non-metropolitan counties is summarized in Table 6.3, including total spending and Medicare spending. Overall, total spending in 1992 for inpatient services to non-metropolitan beneficiaries was $5,657 per stay, which increased to $6,424 per stay in 1998. These amounts are larger than the average total spending per stay for services provided by non-metropolitan hospitals, which was $4,624 per stay in 1992 and $5,087 in 1998 (refer to Table 5.11). Thus, beneficiaries in non-metropolitan counties appear to be obtaining inpatient services from urban hospitals that are more costly than those provided by the local hospitals.

Table 6.3
Average Total and Medicare Spending per Inpatient Stay for Beneficiaries Residing in Non-Metropolitan Counties, by County Category, 1992-1998

	1992	1994	1996	1998
Total Spending per Stay				
All Beneficiaries	$5,657	$5,817	$6,324	$6,424
By county category:				
Adjacent, city 10,000+	5,977	6,176	6,598	6,644
Adjacent, no city 10,000+	5,735	5,918	6,415	6,534
Remote, city 10,000+	5,614	5,747	6,309	6,443
Remote, town 2,500-10,000	5,368	5,496	6,038	6,135
Remote, no town	5,233	5,324	5,924	6,052
Frontier counties	5,637	5,863	6,394	6,493
Medicare Spending per Stay				
All Beneficiaries	$5,015	$5,153	$5,651	$5,721
By county category:				
Adjacent, city 10,000+	5,320	5,493	5,907	5,933
Adjacent, no city 10,000+	5,096	5,257	5,747	5,836
Remote, city 10,000+	4,957	5,071	5,614	5,722
Remote, town 2,500-10,000	4,736	4,842	5,386	5,440
Remote, no town	4,628	4,700	5,280	5,382
Frontier counties	5,012	5,218	5,717	5,816

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Unlike the per capita spending for inpatient services, the average spending per stay was noticeably higher for beneficiaries living in counties adjacent to an MSA or containing a city of at least 10,000 population, compared with those in the more remote counties. However, total spending for beneficiaries in frontier counties was $5,637 per stay in 1992 and $6,493 in 1998, both of which are close to the overall average spending for all non-metropolitan beneficiaries.

The Medicare spending per stay for non-metropolitan beneficiaries mirrors the total spending, at levels of 89 percent of total spending. Medicare spent $5,015 per stay for these beneficiaries in 1992, which increased to $5,721 per stay in 1998.

In Table 6.4, we decompose the total hospitalization rates for non-metropolitan beneficiaries into the components attributable to hospitals with the various types of special Medicare payment designations. For example, of the 333 inpatient stays per 1,000 beneficiaries for 1992, 105 stays occurred in urban hospitals, 93 stays occurred in non-metropolitan hospitals with no special payment designation, and 61 stays occurred in rural referral centers. Thus, in 1992, approximately 30 percent of hospital stays for non-metropolitan beneficiaries are in urban hospitals, and 28 percent are in non-metropolitan hospitals with no special payment designation. The remaining 42 percent of stays were in hospitals with one or more special payment designations.

The share of inpatient stays for beneficiaries in non-metropolitan areas that occurred in urban hospitals did not change much between 1992 and 1998 (rising to 31 percent in 1998). However, with the discontinuation of the designation of Medicare dependent hospitals by 1994, the percentage of inpatient stays in non-metropolitan hospitals with no special designations increased to greater than 38 percent and remained at that level through 1998.

The average length of stay for non-metropolitan beneficiaries who were hospitalized varied by the type of hospital in which the stays took place. Inpatient stays in urban hospitals were longer than those in hospitals located in non-metropolitan counties. In addition, stays in rural referral centers were 1.5 days longer than those in other non-metropolitan hospitals. The inpatient stays shortened considerably between 1992 and 1998, a trend that affected all types of urban and rural hospitals.

Table 6.4
Hospitalization Rates and Average Length of Stay for Medicare Beneficiaries Residing in Non-Metropolitan Counties, by Hospital Payment Designation, 1992-1998

Medicare Payment Designation	1992	1994	1996	1998
Inpatient Stays per 1,000				
All Beneficiaries	333	343	345	348
By hospital designation				
No special designation	93	129	135	134
Sole Community Hospital	34	44	46	50
Rural referral center	61	51	38	36
Indian Health Service hospital	1	1	1	1
SCH and RRC	13	12	13	14
Medicare-dependent hospital	25	<1	2	2
EACH	na	na	1	2
EACH/Referral center	na	na	1	1
Non-certified rural hospital *	<1	<1	<1	1
Urban hospital	105	106	108	109
Average Length of Stay (days)				
All Beneficiaries	7.3	6.6	5.9	5.6
By hospital designation				
No special designation	6.5	5.9	5.4	5.1
Sole Community Hospital	6.2	5.7	5.2	4.9
Rural referral center	7.7	7.0	6.2	5.8
Indian Health Service hospital	6.2	5.9	5.2	5.0
SCH and RRC	7.8	7.3	6.2	5.9
Medicare-dependent hospital	5.9	6.7	4.8	4.8
EACH	na	na	5.4	5.2
EACH/Referral center	na	na	6.4	6.5
Non-certified rural hospital *	12.2	6.6	5.0	4.7
Urban hospital	8.5	7.6	6.7	6.3

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Hospitalization rate is the number of inpatient stays per 1,000 Medicare beneficiaries residing in non-metropolitan counties. LOS is the average number of days per stay.

* The non-certified rural hospitals are not Medicare certified but are used in emergency situations.

The decomposition of Medicare spending per beneficiary for beneficiaries in non-metropolitan counties is presented in Table 6.5, reported in terms of both dollar amounts and percentages, aggregated for all non-metropolitan beneficiaries. Although only 30 percent of inpatient stays took place in urban hospitals, these stays accounted for 45.3 percent of Medicare spending for these beneficiaries in 1992 and 47.2 percent in 1998. These findings are consistent

with other studies finding that rural residents use urban hospitals for a substantial share of their inpatient care, as discussed in Section 1 (Williamson, et al., 1993; Rosehbach and Dayhoff, 1995; McNamara, 1998). Spending for stays in non-metropolitan hospitals with no special designation also increased during the decade. Thus, Medicare per capita spending declined for inpatient stays in hospitals with special payment designations, moving from $570 per beneficiary in 1992 to $496 per beneficiary in 1998.

Table 6.5
Average Medicare Spending per Capita on Inpatient Stays for Medicare Beneficiaries Residing in Non-Metropolitan Counties, and Share of Spending, by Hospital Payment Designation, 1992-1998

Medicare Payment Designation	1992		1994		1996		1998	
	Spending	%	Spending	%	Spending	%	Spending	%
All Beneficiaries	$1,667	100.0	$1,766	100.0	$1,948	100.0	$1,989	100.0
By hospital designation								
No special designation	337	20.2	468	26.5	550	28.2	549	27.6
Sole Community Hospital	134	8.0	173	9.8	197	10.1	215	10.8
Rural referral center	290	17.4	247	14.0	201	10.3	191	9.6
Indian Health Service	2	0.1	3	0.2	3	0.2	4	0.2
SCH and RRC	64	3.8	61	3.5	70	3.6	73	3.7
Medicare dep. hospital	82	4.9	2	0.1	7	0.4	6	0.3
EACH	na	na	na	na	3	0.2	7	0.4
EACH/Referral center	na	na	na	na	6	0.3	4	0.2
Other designation	2	0.1	<1	0.0	2	0.1	n/a	n/a
Non-certified rural	2	0.1	1	0.1	1	0.1	2	0.1
Urban hospital	755	45.3	812	46.0	908	46.6	939	47.2

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: The non-certified rural hospitals are not Medicare certified but used in emergency situations.

When we compare Medicare spending per inpatient stay versus spending per capita for beneficiaries in non-metropolitan areas, we observe quite distinct patterns of variations across types of hospital. Care provided by urban hospitals clearly has increased the overall average spending per stay. As shown in Table 6.6, the average Medicare spending for inpatient stays in metropolitan hospitals is twice that of stays in non-metropolitan hospitals, reflecting the higher acuity services provided by these hospitals. Similarly, Medicare spending per stay at rural referral centers is higher than for other non-metropolitan hospitals. These patterns exist for each year between 1992 and 1998.

Table 6.6
Average Medicare Spending per Inpatient Stay for Medicare Beneficiaries Residing in Non-Metropolitan Counties, by Hospital Payment Designation, 1992-1998

Medicare Payment Designation	1992	1994	1996	1998
All Beneficiaries	$5,015	$5,153	$5,651	$5,721
By hospital designation				
No special designation	3,622	3,627	4,083	4,092
Sole Community Hospital	3,877	3,965	4,311	4,343
Rural referral center	4,755	4,837	5,339	5,348
Indian Health Service	3,804	4,155	4,382	4,476
SCH and RRC	5,007	5,188	5,365	5,416
Medicare-dependent hospital	3,241	4,376	3,324	3,614
EACH	na	na	3,679	3,945
EACH/Referral center	na	na	5,267	5,260
Other designation	4,690	3,404	3,674	n/a
Non-certified rural hospital	3,665	3,281	3,497	3,573
Urban hospital	7,221	7,651	8,401	8,585

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

INPATIENT CARE FOR BENEFICIARIES IN UNDERSERVED AREAS

According to the results presented in Section 3, the supply of hospitals and related services differed for whole county MUAs and whole county HPSAs. Whole county MUAs had the largest supply of hospitals, but these hospitals were smaller and offered fewer services than hospitals in other counties. Whole county HPSAs had fewer and smaller hospitals. We examine here population-based measures of utilization of hospital inpatient services by Medicare beneficiaries residing in counties with shortages of primary care providers, identifying separately counties designated as either MUAs or HPSAs. Where differences in inpatient utilization or spending are observed for beneficiaries residing in shortage areas compared to beneficiaries in other non-metropolitan counties, such differences may be indicators of access issues. We examine trends in utilization first, followed by trends in spending per capita and spending per inpatient stay.

Some consistent variations in hospitalization rates are found for beneficiaries residing in shortage areas, and these differences are similar for MUAs and HPSAs. At the same time, average lengths of stay did not vary by category of shortage areas. As shown in Table 6.7, the 1993 hospitalization rates were 311 stays per 1,000 beneficiaries for beneficiaries in counties

with no MUA designation, compared to 353 stays for those in whole county MUAs and 318 stays for those in partial county MUAs. Similar contrasts are found for HPSAs, although with somewhat different actual rates. Hospitalization rates increased for all beneficiaries between 1993 and 1997, regardless of shortage area designation, while average lengths of stay declined.

Table 6.7
Hospitalization Rate and Average Length of Stay for Medicare Beneficiaries Residing in Non-Metropolitan Counties, by Shortage Areas, 1993, 1995 and 1997

	1993		1995		1997	
	Hospital Rate	LOS	Hospital Rate	LOS	Hospital Rate	LOS
All Beneficiaries	332	7.0	343	6.2	351	5.7
By MUA Designation:						
Not MUA	311	6.8	316	6.0	321	5.5
Whole county MUA	353	7.0	372	6.3	383	5.8
Partial county MUA	318	7.0	324	6.2	329	5.7
By HPSA Designation:						
Not HPSA	336	7.0	344	6.2	359	5.7
Whole county HPSA	354	7.0	372	6.3	378	5.8
Partial county HPSA	316	7.0	329	6.2	333	5.7

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

NOTE: Hospitalization rates are measured as number of inpatient stays per 1,000 Medicare beneficiaries residing in non-metropolitan counties. LOS is the average number of days per stay.

Trends in average total spending and Medicare spending per inpatient stay are reported in Table 6.8, with comparisons for beneficiaries residing in counties with shortage area designations and those in counties without such designation. For MUAs, spending per stay was lowest for beneficiaries in whole county MUAs, and it was highest for those in counties without MUA designation. For HPSAs, spending also was lowest for beneficiaries in whole county HPSAs, but spending for those in partial county HPSAs was similar to that for beneficiaries in counties without HPSA designation. Lower spending per stay may be attributable to lower case mix, lower area wage index, fewer outlier cases, lower disproportionate share payments, fewer hospital with special Medicare payments, or combinations of these factors.

Per capita spending for inpatient services used by Medicare beneficiaries reflects the combined effects of hospitalization rates and spending per inpatient stay. Non-metropolitan

counties designated as whole county shortage areas had higher hospitalization rates than counties not designated as shortage areas, yet they also had lower spending per inpatient stay. These balancing effects are reflected in the average total spending and Medicare spending per beneficiary reported in Table 6.9, with shortage area comparisons. Compared with the higher hospitalization rates in whole county MUAs and HPSAs, the differences in average per capita spending are smaller. Spending for beneficiaries in partial county MUAs is virtually the same as that for beneficiaries in counties without MUA designation. The same is not true for partial county HPSAs, however, where spending per beneficiary tends to be slightly lower than spending in counties without HPSA designation.

Table 6.8
Average Total and Medicare Spending per Inpatient Stay for Beneficiaries Residing in Non-Metropolitan Counties, by Shortage Areas, 1993, 1995 and 1997

	1993		1995		1997	
	Total	Medicare	Total	Medicare	Total	Medicare
All Beneficiaries	$5,736	$5,074	$5,999	$5,330	$6,461	$5,782
By MUA Designation:						
Not MUA	5,938	5,261	6,254	5,572	6,754	6,052
Whole county MUA	5,502	4,854	5,827	5,173	6,299	5,634
Partial county MUA	5,938	5,266	6,093	5,412	6,523	5,837
By HPSA Designation:						
Not HPSA	5,718	5,055	5,957	5,290	6,398	5,715
Whole county HPSA	5,520	4,872	5,832	5,179	6,379	5,720
Partial county HPSA	5,879	5,211	6,125	5,446	6,554	5,869

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Table 6.9
Average Total and Medicare Spending per Capita on Inpatient Services for Beneficiaries Residing in Non-Metropolitan Counties, by Shortage Areas, 1993, 1995 and 1997

	1993		1995		1997	
	Total	Medicare	Total	Medicare	Total	Medicare
All Beneficiaries	$1,904	$1,683	$2,058	$1,828	$2,267	$2,028
By MUA Designation:						
Not MUA	1,845	1,635	1,976	1,761	2,167	1,943
Whole county MUA	1,944	1,715	2,166	1,922	2,411	2,156
Partial county MUA	1,889	1,675	1,973	1,753	2,148	1,922
By HPSA Designation:						
Not HPSA	1,920	1,697	2,052	1,822	2,298	2,053
Whole county HPSA	1,956	1,727	2,167	1,924	2,409	2,160
Partial county HPSA	1,859	1,648	2,013	1,790	2,183	1,955

SOURCE: MEDPAR data for the 100 percent beneficiary population, Medicare Provider of Service Files, Medicare Provider Specific Files, Area Resource File

Section 7.

POLICY IMPLICATIONS AND ISSUES

The information in this report covers a broad range of topics and issues regarding hospital inpatient services for Medicare beneficiaries in rural settings. Yet within the voluminous details, some key trends are identified that have implications for future Medicare payment policy for rural providers. These involve issues of both hospital supply and patterns of inpatient utilization by Medicare beneficiaries who reside in the less populated areas of our country. In this section, we consider some of these issues to set the stage for further analyses in this project that will address issues of access to care for beneficiaries and the contribution of Medicare special payment provisions to per capita costs for rural beneficiaries.

TRENDS IN HOSPITAL SUPPLY

From early years in the decade of the 1990's, there was a gradual decline in the numbers of Medicare-certified hospitals serving counties that are outside of MSAs. The declining trends varied, however, across geographic areas. Losses of non-metropolitan hospitals were greatest in the New York HHS region, and the Kansas City and Denver regions also had larger losses than other regions. The greatest losses also occurred in the most remote rural counties (those that are not adjacent to an MSA and did not have a town of at least 2,500 population), as well as in frontier counties (western counties with population densities equal to or less than 6 persons per square mile). As a result of these trends, there was in increase in the number of non-metropolitan counties that had no hospitals, as well as a decrease in the numbers of hospitals in counties with more than one hospital.

Despite the declining supply of non-metropolitan hospitals, the hospitals that continued to serve these areas showed signs of viability that are encouraging for the future. For example, increased staffing levels over time suggest that hospitals were operating at higher levels of census than they were in the earlier years of the decade. In addition, growing numbers of hospitals are offering home care and hospice services, and have established organized psychiatric inpatient units, which should enhance access to these services for Medicare beneficiaries.

Geographic access to hospital services has been a chronic issue for beneficiaries living in the more remote areas of the country, and this issue is likely to continue into the future. Our analysis documented that the sparsest supplies of non-metropolitan hospital services, whether measured as certified beds per 1,000 population or certified beds per square mile, were in the most remote counties (per the UIC categories). Yet frontier counties appeared to fare better, having bed ratios similar to more urbanized counties. The richest supplies were in counties with a city of at least 10,000 population, especially counties adjacent to MSAs.

Of interest, the mix of hospital ownership shifted as the number of hospitals declined. Growing percentages of the non-metropolitan hospitals were owned by independent hospital districts or authorities, while ownership by local municipal governments decreased. This shift suggests that local governments were using hospital districts as a vehicle to protect them from financial risk, and to offer greater flexibility for hospital management and financing. Trends in for-profit hospitals differed by county categories, where the percentage of hospitals that were for-profit ownership increased in some categories of non-metropolitan counties but decreased in others. The net effect across all non-metropolitan counties was little overall change in for-profit ownership. These location-specific changes may reflect strategic choices by the for-profit owners for rural locations that appeared to be most viable for hospital operation.

As the overall supply of hospitals changed during the 1990's, there also were changes in the mix of hospitals that obtained designations for Medicare special payment provisions or were reclassified for wage indexes for higher payments. The percentage of non-metropolitan hospitals with special payment designations decreased from 54.8 percent in 1992 to 38.2 percent in 1998. Most of this reduction occurred when the Medicare dependent hospital designation was discontinued after 1993. At the same time, the percentage of hospitals reclassified for wage index declined from 25.8 percent to 12.7 percent. It is not obvious what factors contributed to these decreases.

Hospitals designated as rural referral centers were much larger, on average, than other non-metropolitan hospitals, and they provided a greater diversity of services. The rural referral centers also were much more likely than the sole community hospitals to elect wage index reclassification. The sole community hospitals were more similar to hospitals that did not have a

special designation, although they were in more isolated locations, as specified in the eligibility criteria.

MEDICARE INPATIENT UTILIZATION AND SPENDING

Given these trends in supplies of non-metropolitan hospitals, what changes occurred in utilization of these hospitals and in total usage of hospital inpatient services by Medicare beneficiaries residing in non-metropolitan counties? We looked at this question from two perspectives: inpatient services provided by non-metropolitan hospitals, and inpatient services utilized by beneficiaries residing in non-metropolitan counties regardless of hospital location.

From 1992 to 1998, the total number of Medicare inpatient stays served by non-metropolitan hospitals increased by 12 percent, even as the number of hospitals declined. No apparent change was found in the distribution of total stays across county categories (degrees of rurality), but there were changes in the shares provided by hospitals with Medicare special payment designations. The percentages of total inpatient stays increased over time for sole community hospitals and for hospitals with no special payment designation, while percentages decreased for rural referral centers.

In general, sole community hospitals had the largest shares of the Medicare inpatient stays provided by hospitals located in the more remote counties (i.e., remote counties with a town of 2,500 population or without any town), whereas rural referral centers had the largest shares of stays among hospitals in counties with a city of 10,000 population or greater (either adjacent to an MSA or remote). Rural referral centers had much higher case mixes than other hospitals, as reflected in the average DRG weights for inpatient stays at these hospitals. By 1998, referrals from clinics and transfers from other hospitals were the sources for 53 percent of admissions to rural referral centers, which was much higher than for other non-metropolitan hospitals. Although coding errors may be inflating these estimates, high rates of referrals are consistent with the nature of rural referral centers.

These differences in utilization of different types of non-metropolitan hospitals are reflected in the average spending for their inpatient stays. The average Medicare payment per stay for rural referral centers was higher than payments for other hospitals with special payment designation (with the exception of Indian Health Service hospitals that are cost-reimbursed) or

for hospitals with no special designation. When the payments per stay are standardized to payments for a DRG equal to 1.0, however, the average payments for rural referral centers and sole community hospitals become more similar. Average standardized payments for all groups of hospitals with special payment designations remain higher than those for hospitals with no special designation, reflecting the increased payments provided under these designations.

From a population perspective, inpatient services by non-metropolitan hospitals are an important component of inpatient care obtained by beneficiaries living in those non-metropolitan counties, but they are by no means the dominant sources of care. Throughout the decade, urban hospitals served 31 percent of the inpatient stays utilized by beneficiaries in non-metropolitan counties, which represented more than 45 percent of total Medicare spending on inpatient care for these beneficiaries. The average payment per stay provided by urban hospitals was much greater than payments for stays at non-metropolitan hospitals, reflecting a combination of a higher acuity case mix and higher payment rates for urban facilities.

Beneficiaries residing in the more remote counties, as classified based on the UICs, tended to have higher utilization rates than those in more urbanized non-metropolitan counties, despite the generally longer distances to hospital locations. The average Medicare payment per inpatient stay, however, tended to be lower for beneficiaries in remote counties. As a result, the average Medicare payments per beneficiary were similar across the five categories of non-metropolitan counties.

Utilization and spending patterns for beneficiaries in frontier counties contrast sharply with those for other remote counties based on the UICs, suggesting that unique factors were influencing demand for inpatient care in these very sparsely populated counties. Beneficiaries in frontier counties had the lowest rates of inpatient utilization per 1,000 beneficiaries, yet the average Medicare spending per inpatient stay was higher than for any of the other remote counties. The resulting average payment per beneficiary for frontier counties was the lowest of all categories of non-metropolitan counties.

INPATIENT SERVICES IN UNDER-SERVED AREAS

Our analyses of hospital supply and utilization for non-metropolitan MUAs and HPSAs allow us to focus on access issues for locations that have been identified as underserved based on

provider supply and other criteria. The information from these analyses complement our findings regarding overall utilization and spending trends for inpatient care to offer some additional insights regarding implications for access to care. Not surprisingly, the most visible differences we find are between counties that are whole-county shortage areas (either MUA or HPSA) and other counties, either non-shortage areas or counties containing partial-county shortage areas. Pervasive provider shortages across an entire county would be more likely to affect access and utilization than shortages in more localized areas or for specific population groups.

There were more hospitals in whole-county MUAs than other counties, whereas there were fewer hospitals in whole-county HPSAs, which reflects the larger number of counties designated as MUAs. Beneficiaries living in whole-county MUAs utilized inpatient services at higher rates than those in other counties; a similar but weaker difference was found for whole-county HPSAs. Compared with other counties, the average Medicare payment per inpatient stay tended to be lower for beneficiaries in whole-county MUAs but higher for beneficiaries in whole-county HPSAs. Average per capita payments (i.e., per beneficiary) are a net effect of use rates and payment per stay. For whole-county shortage areas, these per capita payments were higher for whole-county shortage areas than for other counties.

DISCUSSION

Despite continuing concerns regarding the viability of the hospital infrastructure in rural areas, the findings of these descriptive analyses offer some evidence of stability in the supply of Medicare-certified hospitals during the 1990s. The hospitals with Medicare special payment designations appeared to play important roles in the delivery of services to beneficiaries in non-metropolitan counties, as shown by their shares of both inpatient stays and Medicare payments. An underlying policy issue, however, is the extent to which the special payments to these hospitals have contributed to their financial viability and retention as operating institutions. Although this issue cannot be assessed fully without detailed data from the facilities themselves, estimates of the portions of payments attributable to the special payment provisions can shed some light on this issue.

Another general issue highlighted by the utilization analysis is that of the relationships between geographic access to hospital inpatient care, beneficiary health status, and observed

utilization of inpatient services. Clearly, beneficiaries residing in the most remote rural counties, including the frontier counties, have to travel longer distances to hospitals, and access to hospitals with specialty capability may be even more difficult. This issue argues for the special payment provisions for rural referral centers to help ensure that such facilities remain available in rural areas. Despite apparent access challenges, we found that beneficiaries in remote locations and in shortage areas (MUAs and HPSAs) had higher rates of inpatient utilization than other rural beneficiaries. Could this utilization include some hospital stays or re-hospitalizations that could have been avoided if they had better access to outpatient services? We also found lower average payments per beneficiary for these beneficiaries, suggesting that their hospital stays were for less intensive, procedures, or that they were less likely to travel to urban hospitals for care. We plan to explore these and other related issues in subsequent analyses of access issues using survey and cost data from the Medicare Current Beneficiary Survey.

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