

CHAPTER

5

**Serving rural
Medicare beneficiaries**

Serving rural Medicare beneficiaries

Chapter summary

In the Patient Protection and Affordable Care Act of 2010, the Congress required that the Commission report on:

- rural Medicare beneficiaries' access to care,
- rural providers' quality of care,
- special rural Medicare payments, and
- the adequacy of Medicare payments to rural providers.

In addition to the findings presented on each of the four topics, this report presents a set of principles designed to guide expectations and policies with respect to rural access, quality, and payments for all sectors. By consistently following this set of principles, Medicare policy can be refined to more efficiently provide access to high-quality care for rural beneficiaries.

In brief, with respect to access, we find large differences in health care service use across regions but little difference between rural and urban beneficiaries' service use within regions. Rural service use is high in regions where urban use is high, and it is low in regions where urban use is low. Beneficiary satisfaction with access is also similar in rural and urban areas. With respect to quality of care, quality is similar for most types of providers in rural and urban areas; however, rural hospitals tend to have below average rankings on mortality and some process measures. Beneficiaries' satisfaction with quality of care is similar in rural and urban areas. With respect to payment,

In this chapter

- Background information on rural Medicare beneficiaries
- Access to health services by rural Medicare beneficiaries
- Rural volumes of care are similar to urban volumes of care, but large regional differences exist
- Quality of care in rural areas
- Payment adequacy and special rural payment adjustments

rural Medicare payments are adequate, in part due to implementation of certain increases in rural hospital payments that followed from recommendations in the Commission's 2001 report on rural health care. Because of higher prospective payment rates and enactment of the critical access hospital (CAH) program, the number of rural hospital closures has declined dramatically in recent years. However, some rural special payments go beyond the Commission's recommendations and are not consistent with the set of payment principles we establish in this paper.

Gathering information from focus groups, surveys, and Medicare claims

Our evaluation of rural health care in America started with a multimethod approach to data collection. We made several site visits to gain the perspectives of Medicare beneficiaries and individuals who deliver health care in several rural areas. We examined information from a series of beneficiary surveys, including the Commission's national telephone survey of Medicare beneficiaries, the Medicare Current Beneficiary Survey, and the Hospital Consumer Assessment of Healthcare Providers and Systems. We used claims data to evaluate beneficiaries' use of services and certain outcomes, such as mortality and readmissions. We examined Medicare cost report data to evaluate rural providers' costs and the profitability of serving Medicare beneficiaries. The combination of these data sources provides a description of service use, access, quality, provider profitability, and rural beneficiaries' experience with the Medicare program across different types of rural areas.

We made the Medicare beneficiary the primary unit of analysis when evaluating access to care. This emphasis differs from some of the literature that focuses on physicians as the unit of analysis and uses counts of local providers per capita as a proxy for beneficiary access. For example, much of the research on physician access counts physicians per capita and discusses physicians' satisfaction with the lifestyle and income associated with rural practice (MacKinney et al. 2011, WWAMI Rural Health Research Center 2009). While these studies are valuable (and we also count physicians per capita), we focused on patient claims data to directly examine how rural beneficiaries' use rates compare with rates for urban beneficiaries, beneficiary survey data to see if rural patients are satisfied with access and quality, as well as beneficiary focus groups to gain a deeper understanding of beneficiaries' perspectives in different areas of the country. Likewise, published research on access to pharmacy services is often limited to examining the number of pharmacy closures or the number of communities without a pharmacy (Boyle et al. 2011, Klepser et al. 2008). In contrast, we examined claims data from 100 percent of rural Medicare beneficiaries, paying particular attention to isolated areas where most beneficiaries have to travel significant distances to a pharmacy. We

also analyzed whether those isolated beneficiaries fill their prescriptions at regional pharmacies or use mail order pharmacies.

Because rural areas in different regions are not always similar, we met with patients and providers in different regions of the country. We interviewed independent rural physicians, talked to leaders of integrated health care systems that serve rural and urban areas, visited isolated providers in frontier areas, and visited managers of freestanding CAHs and rural prospective payment system hospitals. We also spoke with associations representing rural providers and groups organized by the Office of Rural Health Policy. In addition, we met with leaders of rural physician training programs in medical schools who are working to meet the challenge of attracting medical school students who will serve rural areas. The objective was to get diverse perspectives from patients and providers. Because we could not speak to individuals in every rural community, we spent considerable effort gathering claims data from 100 percent of rural beneficiaries and analyzed the degree to which care varies across regions of the country, across different levels of rurality, and across different types of services. By having data from all beneficiaries, we are able to comment on the geographic diversity in the care rural beneficiaries receive.

Beneficiaries' use of services and satisfaction with access are similar in rural and urban areas

Utilization of ambulatory, inpatient, and post-acute services is similar for rural and urban beneficiaries. This finding is consistent with findings from the Commission's 2001 report on rural health care. Service volume for rural patients, who have fewer local physicians per capita, is maintained in part by patients traveling to urban areas for some of their care. In some cases, they travel because of the lack of local providers; in other cases, they choose to bypass local providers for urban providers (Buczko 1994, Liu et al. 2008, Radcliff et al. 2003).

We refer to rural and urban averages in this chapter but realize there is great diversity in rural America. To address this diversity within rural areas, we subdivided counties into four categories: urban, micropolitan counties with a city of 10,000 to 50,000 people, counties without a town of 10,000 or more people that are adjacent to urban areas, and more isolated counties that are not adjacent to an urban area and do not have a town of 10,000 or more people. We also examined frontier counties, with a population density of six or fewer people per square mile, as a second means of examining more remote rural areas. Even within these categories there is diversity, but to keep the analysis tractable, we limit most of our results to these four categories of rural areas. We realize there is also diversity in urban areas but kept that one category for this report because of the focus on rural providers. We found that:

- The volumes of ambulatory, inpatient, and post-acute service use per beneficiary in rural and frontier counties are similar to those in their state's urban areas.
- Not only is average service use similar between urban and rural areas, but the two distributions are similar. That is, similarities exist for the minimum and maximum levels of physician and other health care professional office visits per beneficiary (rural range, 7 to 13 visits; urban range, 7 to 14 visits) and hospital admissions per beneficiary (rural range, 0.19 to 0.46; urban range, 0.19 to 0.47).
- There are wide geographic differences in service use across regions, but within the same region, service use is similar between urban and rural beneficiaries. In Texas and Louisiana, for example, where service use is high for urban beneficiaries, it is also high for rural beneficiaries. Similarly, in Minnesota and Hawaii, where service use is low for urban beneficiaries, it is also low for rural beneficiaries.

In general, we find that the volume of care Medicare beneficiaries receive can vary significantly based on the region of the country in which they live. But within each region, beneficiaries in rural and urban areas generally receive similar volumes of care.

Even though volumes of care are comparable with and without adjustments for health status, there is a concern that rural populations may need more care if they have a significantly greater illness burden than urban populations that is not detected by Medicare claims data. Articles on rural health care often state that rural populations are older, sicker, and poorer than their urban counterparts. We find that this statement does not consistently hold. With respect to illness burden, the evidence is mixed. On average, rural beneficiaries report worse health status, but Medicare claims data suggest they have fewer comorbidities on average. In addition, national surveys of Medicare beneficiaries do not show a consistent pattern of disease burden that might indicate that rural beneficiaries are systematically worse off than their urban peers. With respect to income, the U.S. Department of Agriculture finds that rural areas have slightly higher rates of poverty on average but tend to have slightly lower rates of poverty than urban residents after adjusting for the cost of living (Jolliffe 2006). With respect to age, there is a mixed picture. A higher share of the rural population is over age 65 (Werner 2011). However, within the Medicare population, we find that urban areas have a higher share of beneficiaries over age 85.

Therefore, at least when focusing on Medicare beneficiaries, we see no clear evidence that rural beneficiaries are older, sicker, or consistently live in communities with greater poverty.

While on average we do not see large rural/urban differences, there are some poor rural areas (and some poor urban areas) where the beneficiary population has significant health care needs. For example, the data consistently show that rural and urban individuals age 65 or over in the south central states (AL, KY, MS, and TN) are sicker and poorer than rural and urban individuals in the north central states. They report worse health status, have worse health as indicated by Medicare claims, and have lower life expectancy than rural beneficiaries in north central states. For example, the 2005–2006 mortality rate per 100,000 White women age 65 to 75 in the rural areas of east south central states was 2,125 compared with 1,543 in rural areas of the west north central states (Centers for Disease Control and Prevention 2011). We can conclude that some rural areas tend to have poorer and sicker populations; however, as with service use, differences in health status and wealth appear to differ more among regions of the country than along the rural/urban continuum.

On a positive note, rural areas are adopting new ways to provide access to clinical expertise in small isolated rural communities. For example, mental health providers (who are in short supply in rural areas) are increasingly using telemedicine for consultations with rural Medicare patients. Further research is needed into the adequacy of mental health services in rural areas to determine if traveling and telemedicine could be sufficient to overcome the low numbers of local mental health professionals. In addition, tele-emergency services provide small rural hospitals with access to emergency medicine expertise and support. A third example is telepharmacy. In cases of rural populations being too small to support a traditional pharmacy, telepharmacies are being formed with much lower fixed costs. One pharmacist in a central location can supervise several retail telepharmacy sites and hospital-based pharmacies. The net result is that patients in small towns can benefit from pharmacist expertise without having the patient volume to support a full-time pharmacist.

Quality of care is similar in rural and urban areas for most services, though urban hospitals tend to have better outcomes

We do not find major differences in quality between urban and rural providers in most sectors. Patient satisfaction is similar, and quality measures for skilled nursing facilities, home health agencies, and outpatient dialysis facilities do not show major differences between urban and rural providers. Similarly, hospital readmission measures do not point to major differences based on rural or urban location. However, we find that rural hospitals continue to not perform as well as urban hospitals on most process measures and on condition-specific 30-day mortality rates. Our analysis of 2010 Medicare data is consistent with other findings in the literature over the past 20 years (Joynt et al. 2011a, Keeler et al. 1992, Medicare

Payment Advisory Commission 2006). We find that the higher mortality rates in rural areas are only partially explained by the lower volume of cases in rural hospitals. This finding should not be unexpected, given the limited resources some rural hospitals have to work with, especially in emergency situations. We are not saying that small CAHs cannot achieve good outcomes, only that it may be more difficult and less likely because of limited staff resources and fewer cases to learn from, as others have noted (Joynt et al. 2011a, Joynt et al. 2011b).

Rural payments are adequate and financial performance is similar in rural and urban areas

We examined the adequacy of Medicare payment rates for the various health care sectors and, in general, found Medicare payments to rural providers were adequate (Medicare Payment Advisory Commission 2012). On average, freestanding rural skilled nursing facilities and home health agencies have similar margins for Medicare patients, with some rural and urban home health agencies having relatively high margins. When we examined the adequacy of physician payments, we found similar service use rates, similar ability to obtain appointments with existing and new physicians, and similar satisfaction with access. In addition, the literature and our site visits indicate that physician incomes per hour are comparable in rural and urban areas (Reschovsky and Staiti 2005). These payment adequacy indicators suggest that payments to rural providers are as adequate as payments to urban providers. However, the Commission has raised concerns about the adequacy of primary care physician payments relative to subspecialist payments—concerns that apply to physicians in rural and urban areas (Medicare Payment Advisory Commission 2011b).

While the payment adequacy findings over time are consistent for skilled nursing facilities, home health agencies, and physician services, one area that has changed is the adequacy of rural hospital payments. In 2001, when rural hospitals' inpatient profit margins were below urban hospitals' profit margins, the Commission concluded that Medicare payment rules favored large urban hospitals (Medicare Payment Advisory Commission 2001). As a result, the Commission recommended increasing rural hospitals' base payment rates to the rates paid to large urban hospitals, increasing rural disproportionate share payments, and implementing a low-volume adjustment for isolated rural providers serving areas with low population density that lack economies of scale. The Congress enacted legislation consistent with the Commission's recommendations by 2004 and then endorsed a series of other changes that further increased rural hospital payments. These changes to the hospital prospective payment system, along with expansion of the CAH program, have improved rural hospitals' financial stability significantly, resulting in fewer rural closures.

In some cases special payments are warranted, but in others they are not well targeted

The primary objective of rural special payments is to ensure that Medicare does its part to support the financial viability of rural providers that are necessary for beneficiaries' access to care. Some form of special payments will be needed to maintain access in areas with low population density where providers inevitably have low patient volumes and lack economies of scale. However, some of the special payments are not well targeted. In some cases, they go to providers that compete with nearby neighbors that are also struggling with low patient volumes. Providing special payments to providers that may not need assistance or to low-volume providers that are not the sole providers in their community results in spending that is higher than warranted given the sustainability challenges of the Medicare program.

Programs directed toward rural providers increase Medicare payments by over \$4 billion, or almost 10 percent of all rural payments. Roughly \$3 billion of the additional costs are borne by the taxpayer and \$1 billion is borne by beneficiaries through higher coinsurance at CAHs. Coinsurance is higher because beneficiaries (or in most cases their secondary insurers, such as medigap) pay coinsurance for outpatient services at CAHs equal to 20 percent of charges. Because CAH charges have risen, CAH coinsurance has risen to an average of 47 percent of outpatient payments at CAHs for services subject to coinsurance and varies widely from one CAH to another. The total payment to the hospital is fixed at 101 percent of costs; therefore, as charges increase, the share of that cost-based fee paid by the beneficiary increases. These higher costs at CAHs may not always be necessary, given that 16 percent of CAHs are within 15 miles of another hospital and may not be the appropriate target for special payments.

Guiding principles to evaluate rural access, quality, and special payments

Over several public meetings in 2011 and 2012, the Commission developed principles to guide expectations regarding rural patients' access to care, rural providers' quality of care, and the Medicare program's payments to rural providers. The principles can be used to guide Medicare payment policy, including special payments to rural providers.

Principles of access to care for rural Medicare beneficiaries

Our principle for access is that all beneficiaries, whether rural or urban, should have equitable access to health care services. However, equitable access does not necessarily mean equal travel times for all services. Small rural communities are expected to have fewer physicians per capita and longer travel times to specialists

because there are too few local residents to support some specialties. Whether access is equitable and results in beneficiaries receiving equal services can be evaluated by examining the volume of services received as well as beneficiaries' reported satisfaction with access to all services. Satisfaction can be met by ensuring that rural areas have adequate primary care networks and that rural patients receive referrals for appropriate specialty care when necessary.

Principles of quality of care in rural areas

Expectations for quality of care in rural and urban areas should be equal for nonemergency services rural providers choose to deliver. That is, if a provider has made a discretionary decision to provide a service, that provider should be held to a common standard of quality for that service, whether the service is provided in an urban or a rural location. Emergency services may be subject to different quality standards to account for different levels of staff, patient volume, and technology between urban and rural areas. For example, a patient may have a heart attack with a significant blockage where the standard of care is angioplasty and a stent in a catheterization lab. Urban areas all have catheterization labs. However, small rural hospitals, which may be too far from the nearest catheterization lab to safely transport heart attack patients (even by helicopter), may be forced to use a thrombolytic to treat the blockage. We would not expect equal outcomes in this emergency situation, and the relevant quality benchmark for emergency care should be either other small hospitals or the expected outcomes given additional transportation time if the small rural hospital no longer offered emergency care.

To improve quality at small rural hospitals and give patients quality information, quality data should be collected and reported by all hospitals (including CAHs). CAHs currently have the option of not collecting or reporting quality data. An example of quality metrics that could be especially important to rural patients of small hospitals include the share of medications that are reviewed by a pharmacist (in person or via telemedicine) before the first dose or at least within 24 hours of a drug being administered (Health Resources and Services Administration 2011, Peterson 2011a). A significant share of medication orders at the smallest hospitals do not receive such reviews (Cochran et al. 2008). Other measures that may have particular importance in rural areas include “timely emergency department transfer communication” and the elapsed time between a patient presenting at a rural emergency room and when the patient is “evaluated by a qualified medical professional” (Casey et al. 2012).

Principles of payment adequacy and special payments to rural providers

Providers in rural areas often have a low volume of patients. In some cases, this lack of scale increases costs per unit of service and puts the provider at risk of closure. To maintain access in these cases, Medicare may need to make higher payments to low-volume providers that cannot achieve the economies of scale available to urban providers. However, low volume alone is not a sufficient measure to assess whether higher payments are warranted. Medicare should not pay higher rates to two competing low-volume providers in close proximity. These payments may deter small neighboring providers from consolidating care in one facility, which results in poorly targeted payments and can contribute to poorer outcomes for the types of care where there is a volume–outcome relationship. To target special payments when warranted, Medicare should direct these payments to providers that are uniquely essential for maintaining access to care in a given community. The payments need to be structured in a way that encourages efficient delivery of health care services. We have developed three principles guiding special payments that will allow beneficiaries’ needs to be met efficiently:

- Payments should be targeted toward low-volume isolated providers—that is, providers that have low patient volume and are at a distance from other providers. Distance is required because supporting two neighboring providers who both struggle with low volume can discourage mergers that could lead to lower cost and higher quality care.
- The magnitude of special rural payment adjustments should be empirically justified—that is, the payments should increase to the extent that factors beyond the providers’ control increase their costs.
- Finally, rural payment adjustments should be designed in ways that encourage cost control on the part of providers. While all hospitals have some incentive for cost control (they must keep average costs below average revenue), fixed add-on payments generally have a greater incentive for cost control than cost-based payments. ■

**TABLE
5-1**

Rural groups, UICs, number of counties, and number of fee-for-service Medicare beneficiaries in each group

Rural/urban group	UICs	Number of counties	Number of beneficiaries (in millions)
Metropolitan (urban)	1 & 2	1,089	28.0
Rural micropolitan	3, 5, & 8	675	4.8
Rural adjacent	4, 6, & 7	666	2.1
Rural nonadjacent	9, 10, 11, & 12	711	1.5

Note: UIC (urban influence code). Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, and rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people.

Source: 2009 Beneficiary Annual Summary File.

Background information on rural Medicare beneficiaries

This report focuses on access to, quality of, and payment for rural Medicare services. Because not all rural areas are alike, our analyses divide them into several categories. Because this report focuses on rural areas, we do not similarly categorize urban areas but instead use an urban average as a reference point.

Defining categories of rural counties

CMS defines rural as all counties outside metropolitan statistical areas with 50,000 people. This definition is relatively inclusive and is used for many of our ongoing analyses, but it does not adequately capture the diversity of rural America. Therefore, we further refined our definition of rural areas to acknowledge nuanced differences and the potential challenges faced by more remote and frontier areas.

Our analyses of rural areas are based on a rural/urban continuum developed by the U.S. Department of Agriculture (USDA) that has been used in previous studies (Bennett et al. 2008, Medicare Payment Advisory Commission 2001, Muelleman et al. 2010). Urban influence codes (UICs) divide 3,141 counties into 12 groups, which we consolidated in the following four groups (Table 5-1):

- Metropolitan (urban): urban cluster of 50,000 or more people,
- Rural micropolitan: cluster of 10,000 to 50,000 people,

- Rural adjacent: counties adjacent to urban areas and without a city of at least 10,000 people, and
- Rural nonadjacent: counties not adjacent to an urban area and without a city of at least 10,000 people.

We used another classification of rural counties to account for rural frontier areas. Counties were classified as frontier if the population density was six or fewer people per square mile within that county (Cordes 1989, Patton 1989). These areas are more sparsely populated than most rural nonadjacent counties and therefore merit careful consideration.

We used the USDA’s county-based taxonomy to define rural and urban areas for two main reasons. First, county-based definitions facilitate the link of Medicare claims data with data on income, poverty, supply of health services (including providers and institutions), and geographic location, all of which are available at the county level. Policy discussions are typically conducted within the context of counties and our analyses inform that discourse. Second, UICs already account for several important factors, such as adjacency to metropolitan clusters and travel or commuting times, which are distinguishing factors in defining what is rural. Given that these codes were recently revised to account for population shifts and discriminate among counties based on key characteristics, we chose this taxonomy over others.

Description of the rural Medicare beneficiary population

Rural Medicare beneficiaries represent 23 percent of all fee-for-service (FFS) beneficiaries. They receive roughly 70 percent of their care from rural providers, who receive

over \$50 billion in Medicare FFS payments. The remaining 30 percent of rural beneficiaries' care is provided in urban areas, with specialized services such as coronary artery bypass surgery and neurosurgery primarily provided in urban areas. Nevertheless, significant variation exists across rural areas in how much care is provided locally and how much is provided in urban areas.

To compare the characteristics of beneficiaries in urban counties, rural micropolitan counties, and more isolated counties that are not adjacent to urban areas, we relied on responses from Medicare beneficiaries in the 2008 Medicare Current Beneficiary Survey (MCBS).¹ There is a higher concentration of younger beneficiaries (65–74 years) and fewer older beneficiaries (age 85 or older) in rural counties compared with urban counties (Table 5-2). Overall, the concentration of racial and ethnic minorities is lower in rural counties than in urban counties. Rural areas tend to have lower college graduation rates and a larger proportion of individuals who did not complete high school. The proportions of beneficiaries who dually qualify for Medicaid and Medicare are similar in urban, rural micropolitan, and isolated rural counties. However, the proportion is higher in rural counties adjacent to urban areas, which are disproportionately in south central states where poverty is higher.

Our analysis of health needs or predisposing characteristics that might lead to necessary utilization of health services presents a mixed picture, without clear rural/urban differences. A greater percentage of beneficiaries in rural adjacent areas (33.6 percent) compared with urban areas rated their health as fair or poor. But the proportion of beneficiaries rating their health as fair or poor was essentially the same in rural nonadjacent areas (25.4 percent) as in urban areas (25.5 percent). The proportion of beneficiaries reporting at least one limitation in daily activities (i.e., bathing, dressing, feeding) was highest in rural micropolitan areas (35.4 percent) and lowest in rural adjacent areas (23.3 percent).² The rates for self-reported limitations in activities of daily living (ADLs) are somewhat incongruent with findings on self-rated overall health. When looking at specific conditions, we find arthritis is more common in the most rural areas, but we find mixed results for other health conditions such as depression and diabetes rates in this sample (Table 5-2). Hierarchical condition categories (HCCs), which are the basis of HCC risk scores, follow more of a gradient effect, with rural areas showing higher levels of health status than urban areas.

The health status of rural beneficiaries is mixed. Highlights include:

- Rural beneficiaries tend to be younger than beneficiaries who live in urban areas, and those differences are statistically significant for micropolitan and rural adjacent areas.
- Rural beneficiaries' self-reported indicators of health are not consistently lower or higher than those in urban counties, as indicated by ADL limitations, self-rated health, and several clinical conditions.
- Rural beneficiaries have lower HCC risk scores, which improve as the area becomes more rural, with medical records suggesting they are in better health than urban beneficiaries on average. This finding may reflect rural/urban differences in the coding of diagnoses rather than the relative health of beneficiaries. Critical access hospitals (which are paid costs) and rural health clinics (which are paid a fixed fee per visit) have less incentive to code comorbidities because they do not affect payment.
- The health of beneficiaries in the most isolated rural areas (rural nonadjacent counties) appears to be similar to the health of urban beneficiaries, and in some ways it appears to be better than in urban areas as reflected in ADL limitations and HCC scores.
- Rural adjacent areas present a mixed picture. Compared with urban areas, beneficiaries in rural adjacent areas have lower levels of education, are more likely to rate their health as fair or poor, and are less likely to have one or more problems with ADLs. Rural adjacent counties in the MCBS sample are mainly in south central and Appalachian states, such as Kentucky, Tennessee, and West Virginia, and in some cases have socioeconomic challenges such as low levels of education and high poverty rates.

Access to health services by rural Medicare beneficiaries

The Commission started its analysis of rural access to care by conducting focus groups to listen to the perspectives of rural beneficiaries in different types of rural communities and through site visits to rural providers to hear their perspectives.³ We also conducted focus groups in neighboring urban areas and compared what we heard from rural beneficiaries with what we heard from urban beneficiaries in the same state about their perspectives on access to care and quality of care in their community.

**TABLE
5-2**

Health and demographic characteristics of Medicare beneficiaries, 2008

	Metropolitan (urban)	Rural micropolitan	Rural adjacent	Rural nonadjacent
Demographic (predisposing) characteristics				
Age				
Mean age (years)	71.8	70.7*	69.8*	72.3
64 or younger	16.7%	18.7%	22.2%*	14.4%
65-74	34.5	37.2	36.9	38.4
75-84	33.7	32.0	30.5	34.7
85 or older	15.1	12.1*	10.8*	12.6
Female	54.8%	52.4%	54.4%	55.2%
Race				
White	82.0%	87.6%*	89.2%*	94.7%*
African American	11.6	6.2*	8.0*	1.8*
Asian	1.9	0.4	0.2	0.2
Other	4.5	5.9	2.6	3.3
Hispanic**	7.5	2.8*	2.8*	2.1*
Education				
Less than high school	23.9%	31.5%*	42.4%*	29.6%*
High school graduate	57.9	55.7*	52.2*	59.2*
College graduate	10.7	7.5*	3.5*	7.0*
Postgraduate	7.4	5.3*	1.9*	4.2*
Number in household				
Live alone	32.1%	33.1%	32.4%	29.6%
One other person	49.3	50.5	51.5	55.0
Two or more other people	18.6	16.4	16.2	15.4
Served in armed forces	24.2%	24.8%	21.4%	22.8%
Enabling characteristics				
Medicaid (dual eligibles)	19.3%	20.6%	25.2%*	18.4%
Usual source of care	95.3%	94.5%	94.7%	96.0%
Currently working	12.3%	12.3%	8.0%*	12.7%
Health (need) characteristics				
Self-rated health				
Excellent	15.0%	13.7%*	9.8%*	14.6%
Very good	27.7	26.9*	23.7*	28.3
Good	31.9	31.1*	33.0*	31.8
Fair/poor	25.5	28.3*	33.6*	25.4
Any ADL limitations				
Arthritis	53.5	56.3	55.7	60.5*
Broken hip	3.8	4.1	3.6	3.0
Cancer	18.1	18.4	16.5	18.4
Dementia	2.7	2.4	2.7	2.3
Depression	15.9	18.9*	15.3	15.6
Diabetes	24.0	24.8	21.4	22.6
HCC risk score	1.01	0.97*	0.96*	0.95*

Note: ADL (activity of daily living), HCC (hierarchical condition category). States well represented in Medicare Current Beneficiary Survey sample of rural adjacent areas include: AL, KY, MI, TN, TX, WV, reflecting areas primarily in the southeastern region of the United States. Very few individuals were from CA, IL, MO, NV, OK, SC, WI. States represented in rural nonadjacent counties are: IA, MI, MO, OH, PA, TN, TX. Metropolitan (urban) counties (n=10,035) contain an urban cluster of 50,000 or more people, rural micropolitan counties (n=2,101) contain a cluster of 10,000 to 50,000 people, rural adjacent counties (n=686) are adjacent to urban areas and without a city of at least 10,000 people, and rural nonadjacent counties (n=571) are not adjacent to an urban area and do not have a city with at least 10,000 people. (N = 13,393.)

* The difference between that rural category and metropolitan areas is statistically significant at a 95 percent confidence level.

** Beneficiaries who identify their origin as Hispanic may be any race.

Source: Medicare Current Beneficiary Survey, 2008. HCC risk scores are from CMS.

**TABLE
5-3**

**Rural areas have fewer
physicians per capita**

Per 1,000 people:

Type of region	Primary care physicians	Specialists
Range:		
CBSA urban areas	0.3 to 3.5	0.3 to 10.7
State-wide rural	0.5 to 1.3	0.3 to 2.1
Mean:		
Metropolitan (urban)	1.1	1.6
Rural micropolitan	0.7	0.7
Rural adjacent	0.5	0.2
Rural nonadjacent	0.7	0.3
Frontier	0.6	0.3

Note: CBSA (core-based statistical area). Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile. CBSA urban areas (n=361); state-wide rural (n=48).

Source: MedPAC analysis of Area Resource File data from the AMA masterfile for 2008.

We also analyzed national survey data, as well as claims data from 100 percent of all rural FFS beneficiaries. We sought to answer three empirical and policy questions with respect to rural beneficiaries’ access to care:

- Do rural beneficiaries use similar volumes of services compared with urban beneficiaries?
- Are rural beneficiaries satisfied with their access to care?
- What principles can guide our expectations with respect to the availability of care in rural communities?

Summary of findings on service use and satisfaction

On average, rural beneficiaries use health care services at rates similar to urban beneficiaries. Most beneficiaries report that access to care is largely adequate, and we find few distinctions in satisfaction between rural and urban areas. Lower levels of physician supply and economic challenges in rural areas do not appear to translate to reduced volume of care or lower levels of satisfaction in the Medicare population. Our current findings are similar

to the Commission’s findings using 1999 utilization data; we concluded that the frequency of getting needed care and satisfaction with care were “strikingly similar” in rural and urban areas (Medicare Payment Advisory Commission 2001). Our findings are not meant to suggest that no rural beneficiaries experience difficulties with access to needed care. In fact, survey data and our site visits confirm that travel times can be an obstacle for some rural beneficiaries. However, we are suggesting that most rural beneficiaries have overcome these obstacles and use levels of services comparable to beneficiaries in urban areas. The fact that relatively few beneficiaries report problems accessing care may in part be due to the success of federal, state, and local efforts to improve access to care for beneficiaries living in rural areas of the country.

Guiding principles for rural access to care

The Commission’s principle for access to care is that rural beneficiaries should have equitable access to services. The Commission has discussed access to care over the past year and concluded that equity in access can be measured by beneficiaries’ service use rates as well as beneficiaries’ reports of their experience with the health system. Services used include physician visits, hospital admissions, post-acute care, and other Medicare-covered services.

The Commission recognizes that some rural beneficiaries may travel longer to get care than their urban counterparts. For example, the South Carolina Rural Health Research Center found that 41 percent of rural residents traveled more than 30 minutes for medical care compared with 25 percent of urban residents (South Carolina Rural Health Research Center 2007). This finding should not be unexpected. Some rural communities are too small to generate the patient volume needed to achieve high-quality outcomes for certain types of services. For these services, rural beneficiaries often drive or are transported for care. However, access may still be deemed equitable if rural beneficiaries receive the needed care and are satisfied with their access to care.

Analyses conducted to examine access

To assess access to care, we conducted several analyses examining Medicare beneficiaries’ service utilization rates and satisfaction with access to care. For service use, we examined Part A, Part B, and Part D Medicare drug spending claims for 100 percent of FFS beneficiaries. To examine satisfaction, we focused on two patient surveys: the latest available (2008) MCBS and the Commission’s 2011 Medicare beneficiary telephone survey.

Physician supply and economic challenges in rural areas

There are fewer primary care physicians, psychiatrists, and other specialists per capita in rural areas compared with urban areas (Institute of Medicine 2004). There is also a concern that the physician workforce is aging, with some states finding that rural physicians have an older average age than urban physicians (e.g., Missouri) and other states finding they have similar ages (e.g., Mississippi) (Colwill et al. 2008, Missouri Hospital Association 2011, Street et al. 2009). On average across the nation, the University of Washington found that 27.5 percent of primary care physicians are over age 55, compared with 25.5 percent of urban physicians (WWAMI Rural Health Research Center 2009). When we examined the numbers of physicians across rural areas, we found fewer physicians per capita in rural areas on average, but rural physician-to-population ratios vary widely across states (Table 5-3).

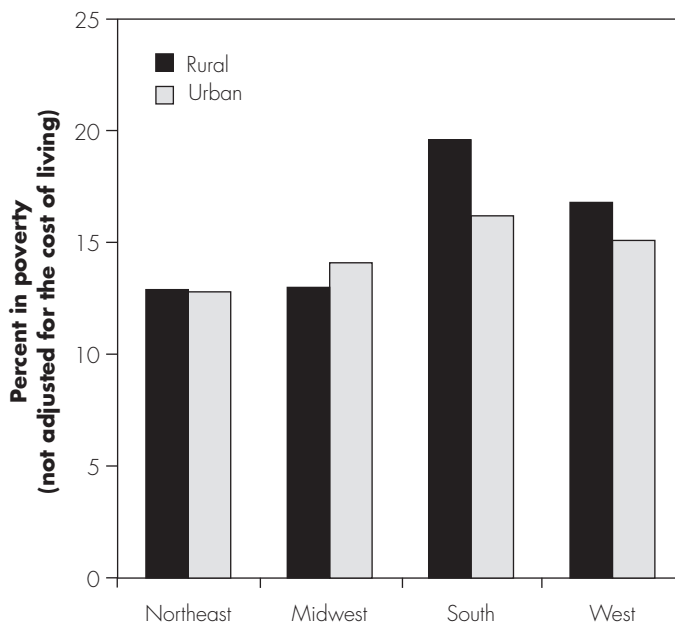
Nurse practitioners (NPs) and physician assistants (PAs) are important sources of care in rural areas, although their numbers in rural areas to date are roughly proportionate to the population and may not offset the smaller number of physicians (Everett et al. 2009, Hooker and Berlin 2002, Hooker and Ciper 2005). Variation in PA and nursing regulations exists across states that may limit PAs and advanced practice registered nurses' ability to practice to the full extent of their education and training. States that anticipate future physician shortages may consider reforming scope-of-practice regulations, as detailed in the recommendations by the Institute of Medicine, to facilitate NPs' and PAs' delivery of primary care in affected rural areas (Institute of Medicine 2010).

In addition to emphasizing the smaller number of health care providers, many in the literature cite economic challenges in rural communities, suggesting poverty rates are higher, making it more difficult to support health care providers (Bennett et al. 2008, Braden and Beauregard 1994, Kaiser Commission on Medicaid and the Uninsured 2003, McBride and Kemper 2009, Schur and Franco 1999, National Advisory Committee on Rural Health and Human Services 2008).

While rural poverty rates were twice urban poverty rates in the 1960s, with over 30 percent of rural Americans living in poverty, the gap has slowly been closing for 50 years; by 2011, the rate of poverty in rural areas was only 1.6 percentage points higher than in urban areas (16.5 percent rural vs. 14.9 percent urban for all citizens and 10.3 percent rural vs. 8.7 percent urban for senior citizens)

FIGURE 5-1

Share of the population in poverty varies by region



Note: Poverty levels are not adjusted for costs of living. Poverty rates are for all citizens, but U.S. Department of Agriculture research indicates a similar rural/urban poverty gap for senior citizens.

Source: Economic Research Service 2011, analysis of the Census Bureau's 2011 Current Population survey.

(Economic Research Service 2011, Jolliffe 2002). This 1.6 percentage point differential is due to higher poverty rates in southern states, and there are no consistent rural/urban differences across the country (Figure 5-1). It should also be noted that the standard definition of poverty does not adjust for the cost of living; adjusting poverty rates for the cost of living in each locale, the USDA found that the average rates were slightly lower in rural areas (Jolliffe 2006). The data suggest that, on average, rural and urban areas experience similar levels of economic stress.

While there is not a consistent difference in average poverty rates across rural and urban areas, certain rural and urban communities face persistently high levels of poverty and worse health status. For example, poverty levels tend to be persistently high in many rural counties in east south central states (AL, KY, MS, and TN) and the data consistently show that rural and urban individuals over age 65 in the east south central states are sicker and poorer than rural and urban individuals in north central states. For example, the 2005–2006 mortality rate per 100,000 White women aged 65 to 75 years in the rural areas of

**TABLE
5-4**

Physician supply and economic challenges

Characteristic	Rural compared with urban areas	Share of state-wide rural areas below the median urban area
Primary care physician supply	Lower	90%
Specialist supply	Lower	98
Income per capita*	Lower	79
Percent of population with a college degree	Lower	83
Percent of population above poverty line*	Similar	58
Percent of population with a high school or greater education	Similar	54
Rates of insurance for under 65	Similar	58
Share of FFS beneficiaries with supplemental coverage (e.g., medigap)	Similar	58

Note: Income per capita data are from 2006.
*Not adjusted for the cost of living.

Source: 2010 rates of supplemental Medicare insurance or Medicare Advantage plan membership are from CMS. Other data are from the 2008 Area Resource File. Data for physician supply and poverty rates are 2007 data, education is 2000 rates. Rates of insurance for under 65 population are from 2005 and reported in the Area Resource File.

east south central states was 2,125 compared with 1,543 in rural areas of west north central states (Centers for Disease Control and Prevention 2011). We conclude that some rural areas tend to have poorer and sicker populations than other rural areas; however, differences in health status and wealth appear to be greater among regions than along the rural/urban continuum.

A broader set of socioeconomic variables across rural areas presents a mixed picture. We find that the vast majority of rural areas have fewer physicians per capita than urban areas, but we fail to find consistent rural/urban differences when we examine income, education, and insurance status (Table 5-4). For example, in 90 percent of states, the median supply of primary care physicians

in rural areas is below the urban median; in 98 percent of states, the median supply of specialist physicians in rural areas is below the urban median. In contrast, rural rates of insurance, poverty, and completion of a high school education are similar to urban rates. This finding does not suggest that some rural communities do not face difficult challenges—they exist in some rural areas and are real. It suggests that there are no consistent rural/urban differences in poverty and other socioeconomic variables. The socioeconomic differences we see are more of a regional phenomenon (i.e., in the south central United States) than an urban/rural phenomenon.

Similarly, we see bigger regional differences than rural/urban differences for rates of the uninsured among those

**TABLE
5-5**

Rates of private supplemental insurance among Medicare beneficiaries

	Total	Metropolitan (urban)	Rural micropolitan	Rural adjacent	Rural nonadjacent
Medicare only	10.2%	9.4%	11.2%	16.2%	9.7%
Dual eligibles	19.7	19.1	20.9	24.3	17.5
Employer-sponsored insurance	39.4	41.8	33.6	31.5	36.8
Medigap/other	30.8	29.7	34.4	28.1	36.0

Note: Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, and rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people,

Source: Medicare Current Beneficiary Survey, Cost and Use Files, 2007.

less than 65 years old. While rural populations rely more on public insurance coverage, rural and urban areas have similar rates of uninsured people overall (rural, 16.2 percent; urban, 16.3 percent) and for the under-65 population (DeNavas-Walt et al. 2011, King and Holmes 2011, Ziller et al. 2008). In contrast, there are large regional variations in the rate of uninsured populations under age 65—for example, 13 percent in North Dakota compared with 31 percent in Texas (Kaiser Family Foundation 2011).

The distribution of Medicare beneficiaries with supplemental insurance reflects regional trends we see in poverty and health status. As shown in Table 5-5, beneficiaries in rural adjacent counties are more likely to have Medicare-only insurance, the highest rate of dual-eligible beneficiaries, the lowest rate of employer-sponsored insurance, and the lowest rate of medigap or other supplemental insurance. Further examination of the MCBS Cost and Use data, however, shows that most beneficiaries who resided in the counties classified as rural and adjacent to an urban area were concentrated in Alabama, Tennessee, Texas, and West Virginia. These states are in the southern and Appalachian regions of the country where poverty rates have been higher relative to the rest of the country. In contrast, the most isolated rural counties (rural nonadjacent) are more likely to be in the midwestern and northern states. In these rural counties, we see average levels of Medicare-only (9.7 percent) and lower levels of dual-eligible (17.5 percent) beneficiaries. The differences in Medicare-only status could reflect a regional phenomenon rather than an effect of being rural. We examined regional variation in service use to determine whether beneficiaries in the poorer rural regions of the country are receiving the same volume of care as those in wealthier rural regions where beneficiaries are more likely to have supplemental insurance.

Rural volumes of care are similar to urban volumes of care, but large regional differences exist

Our analysis of claims data for 100 percent of Medicare beneficiaries from 2006 to 2008 finds that on average rural and urban beneficiaries receive similar levels of care, but there is a wide degree of regional variation (Table 5-6). The distribution of regional variation in ambulatory visits is similar for rural and urban areas (urban range, 7 to 14; rural range, 7 to 13), and the distribution of annual

TABLE 5-6

Regional variations are generally larger than rural/urban differences

Region	Per beneficiary per year:	
	Visits to physician office or outpatient facility	Hospital admissions
Range:		
CBSA urban areas	7 to 14	0.19 to 0.46
State-wide rural	7 to 13	0.19 to 0.47
Mean:		
Metropolitan (urban)	10.1	0.33
Rural micropolitan	10.7	0.34
Rural adjacent	10.4	0.35
Rural nonadjacent	10.7	0.35
Frontier	9.8	0.31

Note: CBSA (core-based statistical area). Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile.

Source: MedPAC analysis of beneficiary-level Medicare spending from the 2008 Beneficiary Annual Summary File and Medicare inpatient claims for all beneficiaries with Part A or Part B coverage.

hospital admissions per beneficiary is also similar (urban range, 0.19 to 0.46; rural range, 0.19 to 0.47 rural). Even beneficiaries who live in more remote areas tend to have rates of ambulatory care (e.g., physician office visits) and inpatient hospital use similar to beneficiaries in urban areas. This finding contrasts with a study by Chan, which found that rural beneficiaries have fewer visits paid under the physician fee schedule than urban beneficiaries (Chan et al. 2006). However, the Chan study failed to include rural health clinic visits in its data, which our analysis includes. Our findings using 2008 data are consistent with what we found using 1999 data (Medicare Payment Advisory Commission 2001). Our findings are also consistent with a recent study showing that rural beneficiaries receive slightly more surgeries per capita than urban residents (Francis et al. 2009, Francis et al. 2011). The combination of far fewer specialists per beneficiary in rural areas and rural beneficiaries receiving more surgeries per capita than urban beneficiaries (at rural and urban locations) suggests that rural patients often travel to urban areas to receive care.

**TABLE
5-7**

Urban and rural service use rates are similar within states, but wide regional variation exists

	Urban service use/ national average	Rural service use in the state/ national average
National average	1.005	0.984
Low-use regions		
Honolulu, HI	0.76	0.75
Madison, WI	0.86	0.86
Billings, MT	0.96	0.90
High-use regions		
Monroe, LA	1.30	1.29
Oklahoma City, OK	1.16	1.15
Dallas, TX	1.19	1.14

Note: Service use is per capita of inpatient, outpatient, physician, post-acute, durable medical equipment, and hospice services among fee-for-service beneficiaries in each region adjusted for the patient's health status. Regions are defined as metropolitan statistical areas for urban counties and rest of state nonmetropolitan areas for nonurban counties.

Source: MedPAC analysis of beneficiary-level Medicare spending from the Beneficiary Annual Summary File and Medicare inpatient claims data, 2008.

In addition to hospital admissions and ambulatory care visits, we examined overall service use aggregating inpatient, outpatient, physician office, rural health clinic, home health care, skilled nursing care, hospice, and other sources of patient care (Table 5-7). Overall service use is adjusted for health status (Medicare Payment Advisory Commission 2011c). The average rural beneficiary's service use rate is 98.4 percent of the national average, compared with the average urban beneficiary's service use rate of 100.5 percent of the national average. In other words, average rural service use is 2 percent lower than average urban use. However, these averages mask wide regional variation.⁴ In certain states, such as Louisiana and Oklahoma, use rates for both rural and urban beneficiaries are 15 percent or more above average. In other states, such as Hawaii and Wisconsin, use rates for both rural and urban beneficiaries are 14 or more points below average. Thus, while utilization varies across regions, it tends to be similar for rural and urban areas within a region. We also found that, despite reduced levels of medigap coverage, beneficiaries who have higher disease burdens in southeastern states appear to receive relatively high levels of health services.

We separately compared hospital inpatient and post-acute care use in rural and urban areas. As with ambulatory care, we found that patterns of post-acute care use were similar in urban and rural areas within a state but varied widely

across regions (Table 5-8). In states with high levels of post-acute care, such as Texas, rural areas also had high levels of post-acute care, and the high level of post-acute care was not fully explained by more inpatient care. This finding was true for services that tend to be more entrepreneurial, such as home health care and durable medical equipment, where regional differences can be dramatically larger than rural/urban differences.⁵ To be clear, we do not claim that average levels of care in any particular urban or rural area are the correct level of care; nor can we state the optimal level of care given available information. We note only that the volumes of inpatient and post-acute care services provided to rural beneficiaries and urban beneficiaries tended to be similar. However, in both rural and urban areas some individual communities may have difficulties accessing home health services. These individual situations may in part reflect decisions made by state and local governments about payments for non-Medicare patients.

Use of post-acute care varies by levels of rurality

While state-wide rural areas may have similar use of post-acute care, we also wanted to see if the use rates vary dramatically by type of rural area. For example, do frontier counties tend to have significantly fewer home health visits or days in skilled nursing facilities (SNFs)?

**TABLE
5-8**

Levels of acute inpatient and post-acute care use in rural areas are similar to urban, but wide regional variation exists

	Relative acute inpatient use		Relative post-acute care use	
	Urban	Rural*	Urban	Rural*
Urban and rural averages as a share of the national average	0.99	1.02	1.01	0.95
Range for urban MSAs and rural state-wide areas	0.8 to 1.2	0.8 to 1.2	0.3 to 3.2	0.5 to 2.2
Low-use regions				
Honolulu, HI	0.89	0.83	0.48	0.53
Madison, WI	0.94	0.98	0.77	0.67
Billings, MT	1.00	0.98	0.63	0.65
High-use regions				
Monroe, LA	1.11	1.16	2.20	2.19
Oklahoma City, OK	1.09	1.14	1.47	1.47
Dallas, TX	1.00	1.06	1.81	1.54

Note: MSA (metropolitan statistical area). Service use is per capita service use among fee-for-service beneficiaries in each region adjusted for the patient's health status. Regions are defined as MSAs for urban counties and rest of state nonmetropolitan areas for nonurban counties. Post-acute care includes skilled nursing facilities, swing bed, home health care, inpatient rehabilitation facilities, and long-term care hospitals.
*In the rural areas of the state.

Source: MedPAC analysis of beneficiary-level Medicare spending from the 2006–2008 Beneficiary Annual Summary File and Medicare inpatient claims.

We found that levels of SNF and home health care use are similar in nonfrontier rural counties and urban areas. However, beneficiaries in frontier areas tend to use fewer post-acute care services, averaging 1.4 SNF days per FFS beneficiary per year (Table 5-9). The frontier level of 1.4 SNF days per FFS beneficiary is lower than in 78 percent of the urban areas. A key question is whether this lower use in frontier counties is associated with their low population density or is primarily associated with the practice patterns of rural and urban areas in the western United States where most of these counties are located. To test this hypothesis, we examined SNF use in urban areas of five western states with significant frontier populations (Montana, North Dakota, Nevada, South Dakota, and Wyoming). The urban areas of these five states averaged 1.5 SNF days per FFS beneficiary, compared with 1.4 in the rural areas of these states. It appears that the lower use of SNF services in frontier counties is primarily due to the regional pattern of SNF use.

Use of home health care showed a similar pattern. Rates of home health use in most rural counties were similar to urban rates. However, the frontier counties average 0.08 home health episode per beneficiary, far lower than

**TABLE
5-9**

Skilled nursing facility and home health service volume in rural areas

Region	Per capita per year:	
	Skilled nursing facility days	Home health episodes
Range:		
CBSA urban areas	0.5 to 3.1	0.01 to 1.29
State-wide rural	0.8 to 2.8	0.03 to 0.52
Mean:		
Metropolitan (urban)	2.1	0.15
Rural micropolitan	1.9	0.14
Rural adjacent	1.9	0.16
Rural nonadjacent	1.8	0.15
Frontier counties	1.4	0.08

Note: CBSA (core-based statistical area). Skilled nursing facility days include skilled nursing days in hospital swing beds. Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile.

Source: MedPAC analysis of 2008 Beneficiary Annual Summary File data and home health claims data.

**TABLE
5-10****Medication use by region****Per Part D enrollee:**

Region	Monthly spending	Monthly prescriptions
Range:		
CBSA urban areas	\$149 to \$297	3.0 to 4.9
State-wide rural	138 to \$248	3.2 to 4.9
Mean:		
Metropolitan (urban)	215	4.0
Rural micropolitan	216	4.2
Rural adjacent	209	4.3
Rural nonadjacent	206	4.3
Frontier counties	175	3.8

Note: CBSA (core-based statistical area). Expenditures are based on ingredient costs and do not include dispensing fees or taxes. Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile. CBSA urban areas (n=361); state-wide rural (n=48).

Source: MedPAC analysis of 2008 prescription drug event claims.

the urban average. The question once again is the degree to which the lower use of home health care reflects something systematic about frontier areas and the degree to which it reflects something about the practice patterns in western states where the frontier counties are located. Urban areas in the five frontier states average 0.8 home health episode per beneficiary, again suggesting that most of the difference between frontier areas and urban areas reflects regional variation, with southern states having much higher use of home health care than western states where many frontier counties are located.

To be clear, we cannot conclude that there are no access issues for home health and skilled nursing care in rural and frontier areas. We are also not saying what the right level of home health care should be. We are simply saying that we are not able to see a systematic difference in the volume of services between categories of rural and urban areas that is not tied to the large regional differences in use of post-acute care.

Rural access to care for dialysis among fee-for-service beneficiaries

In our focus groups of rural beneficiaries, several individuals mentioned driving to larger communities for

dialysis treatments. In 2009, about 22 percent of FFS beneficiaries with end-stage renal disease (ESRD) resided in rural areas while about one-quarter of all dialysis facilities were located in rural areas. During the past five years, the share of beneficiaries with ESRD residing in rural areas and the share of dialysis facilities located in rural areas has remained constant.

One measure of access is the distance that dialysis beneficiaries traveled to seek care. Longer travel time to the dialysis unit has been linked to decreased adherence to the dialysis prescription and increased mortality. We calculated the travel distances for new FFS dialysis beneficiaries in 2004, 2006, and 2008 based on the patients' street addresses (Medicare Payment Advisory Commission 2012). Dialysis beneficiaries who reside in rural areas traveled farther to obtain care than urban beneficiaries. In 2008, the median driving distance was 10.4 miles for rural beneficiaries compared with 5.5 miles for urban beneficiaries. The distances traveled by rural beneficiaries varied. For example, in 2008, one-quarter of rural beneficiaries traveled 3.2 miles or less to obtain care while one-quarter of them traveled 21.4 miles or more. Between 2004 and 2008, the median driving distance for rural beneficiaries declined slightly from 11.0 miles to 10.4 miles.

Another indicator of beneficiary access is the capacity of dialysis providers to furnish care, measured by changes in the number of hemodialysis treatment stations and the number of dialysis facilities. Dialysis providers' capacity has grown at a faster rate in rural areas than in urban areas. During the past five years, the number of hemodialysis treatment stations in rural areas grew by 4.3 percent per year, compared with 3.8 percent per year in urban areas. During the same period, the number of facilities in rural areas grew by 3.2 percent per year, compared with 3.7 percent per year in urban areas.

Use of prescription drugs

On average, beneficiaries in rural areas take about the same number of prescription drugs as, and have expenditures similar to, beneficiaries in urban areas (Table 5-10). Beneficiaries average 4 prescriptions per month in urban areas, compared with 4.3 in nonmicropolitan rural areas. Beneficiaries' average expenditures per month range from \$215 in urban areas to \$206 in rural nonadjacent areas. Beneficiaries living in frontier counties average slightly fewer drugs at 3.8 prescriptions per month. The small observed differences between rural and urban areas (0.3 difference in prescriptions) are considerably less than

the variation between urban areas and between state-wide rural areas in different regions. For example, in 2008, the average number of prescriptions per month across urban areas varied from 3.0 to 4.9, and monthly expenditures ranged from \$149 to \$297. Rural monthly per capita prescriptions varied across rural areas from 3.2 to 4.9, and expenditures ranged from \$138 to \$248 per month.

The frontier category of rural areas is the exception to the pattern of similar use between urban and rural areas. In frontier areas, beneficiaries on average used 0.2 fewer prescription per month and spent \$40 per month less than the overall urban average. When we compare the number of prescriptions filled by frontier beneficiaries with those filled by urban beneficiaries in the same state, the differences in prescription use and expenditures drop to 0.1 prescription and \$23 per month, respectively.

Access to prescription drugs in rural areas

Beneficiaries living in rural areas often have to travel to receive medical services, including prescription drugs. In the case of drugs, the number of retail pharmacies located in rural areas has declined over the past two years. We analyzed whether this decrease has affected beneficiary access to prescription medications. We found that rural beneficiaries displayed similar utilization levels as urban beneficiaries on average and that regional variance in utilization was similar for rural and urban beneficiaries. We did not find access problems, although some beneficiaries had to travel considerable distances to the nearest retail pharmacy. As a group, rural beneficiaries tended to use multiple pharmacies and chain stores; it was somewhat surprising that they were less likely to use mail order pharmacies than Part D beneficiaries as a whole.

Access to pharmacies in rural areas

About 1 in 15 pharmacies participating in Part D is located in a rural area. Recent trends show that between 2007 and 2009, the number of Part D pharmacies fell 4 percent in rural areas compared with a very slight increase nationwide. Pharmacy access in rural areas showed the following trends:

- Independent pharmacies represent about 60 percent of the rural retail market, in contrast to urban areas, where chain pharmacies predominate (Shambaugh-Miller et al. 2007);
- From 2007 through 2009, the number of independent pharmacies declined in rural and urban areas. In rural areas, independent pharmacies representing 6 percent

of all rural pharmacies closed, and in urban areas, independent pharmacies representing 2 percent of urban pharmacies closed.

- Some of the decline in independent pharmacies represented pharmacies changing from independent to a chain or franchise.
- Chain pharmacies grew by 5 percent in rural areas and 4 percent in urban areas.
- Pharmacy closures most commonly occurred in areas with competing pharmacies. However, in roughly 30 percent of the closures, a community was left without a pharmacy in the town (Boyle et al. 2011, Klepser et al. 2008, Xu et al. 2009). Therefore, it is important to evaluate whether Medicare beneficiaries without a pharmacy in town fill prescriptions at other pharmacies in the region or use mail order to obtain medications.

Part D plans must establish pharmacy networks so that 70 percent of beneficiaries within their service area have access to a network pharmacy within 15 miles of their home. In 10 percent of rural counties (121 counties), representing 2 percent of rural beneficiaries (68,596 individuals), beneficiaries had to travel 15 miles or more, on average, to the nearest pharmacy, referred to here as low-access counties (Table 5-11, p. 136).⁶ That is not to say there are no individuals in other counties who have to drive more than 15 miles to a pharmacy. However, these counties are the only ones where the driving distance for beneficiaries averages more than 15 miles. With a few exceptions, these low-access counties were located in the western United States, especially the Great Plains and Alaska (Figure 5-2). Despite the reduction in the number of retail pharmacies, we did not observe an increase in travel distances between 2007 and 2009 for beneficiaries in rural counties generally or in low-access counties in particular. The reason for this finding is that the pharmacies that closed tended to be low-volume pharmacies near other pharmacies.

Research showed a significant number of rural pharmacy closures through 2010 (Boyle et al. 2011, Klepser et al. 2008). While these studies raise serious concerns about access to pharmacy services, they do not examine whether beneficiaries in towns without a pharmacy are still filling their prescriptions at other pharmacies in their region. Because of concerns over these closures, we contracted with Acumen, LLC, to conduct a beneficiary-focused analysis to determine whether beneficiaries without a

**TABLE
5-11**

Average distance to a Part D pharmacy in rural areas

Distance to nearest Part D pharmacy	Rural counties		Rural beneficiaries	
	Number	Percent	Number	Percent
Less than 5 miles	193	16%	968,962	27%
5 miles to <10 miles	789	63	2,356,729	66
10 miles to <15 miles	145	12	201,270	6
15 miles or more	121	10	68,596	2
Total	1,248	100	3,595,557	100

Note: Distances are computed based on the pharmacies' addresses and the population distribution across the beneficiary's ZIP code.

Source: Acumen analysis of 2008 Part D denominator file, Pharmacy cost file, and National Council for Prescription Drug Programs (NCPDP) for MedPAC.

nearby pharmacy are still accessing medications. Acumen found that beneficiaries without a local pharmacy are still accessing medications via regional pharmacies without having to resort to mail order pharmacies.

To examine pharmacy use for beneficiaries without nearby pharmacies, Acumen analyzed Part D claims data for the 100 rural counties with the highest average distance to a participating Part D pharmacy. In 2008, 25,724 beneficiaries enrolled in Part D lived in these low-access counties where the average distance to a pharmacy was 18 or more miles. The purpose of this analysis was not to identify all rural beneficiaries with significant travel times but to identify 100 counties where the average travel

time was the longest. Of the beneficiaries in these 100 counties, 89 percent (22,963 beneficiaries) had at least one prescription filled. They averaged 38 fills each for a total of about 874,000 total prescriptions filled during the year. On average, beneficiaries in low-access counties were older than Part D enrollees overall, less likely to be disabled, and more likely to be White or Hispanic. Ninety percent of beneficiaries in these counties who filled prescriptions used retail pharmacies to purchase their drugs.

Beneficiaries in these low-access counties tended to use multiple pharmacies (Table 5-12). In fact, beneficiaries living in low-access counties used about 5,600 different pharmacies in 2008. They received 84 percent of their prescriptions from retail pharmacies with the majority of beneficiaries (66 percent) getting at least one prescription from a chain pharmacy compared with 53 percent from independents. About 25 percent of beneficiaries purchased at least some drugs at Walmart, although only 14 percent of total prescriptions were purchased there. Three percent of fills were dispensed by mail order pharmacies, but these prescriptions tended to represent more days' supply than individual retail prescriptions. Beneficiaries using more than five prescriptions per month were no more likely to use mail order than other beneficiaries in low-access counties. Beneficiaries in low-access counties were somewhat more likely than average to get their medications from federally qualified health centers, rural health clinics, Indian Health Service, and hospitals.

Despite the large number of pharmacies used by beneficiaries from low-access counties, they received 51 percent of their prescriptions from 607 rural pharmacies (Table 5-13, p. 138). Almost half of their fills (49%) were obtained from nonrural pharmacies. Even more striking,

**TABLE
5-12**

Fills dispensed by pharmacy type, 2008

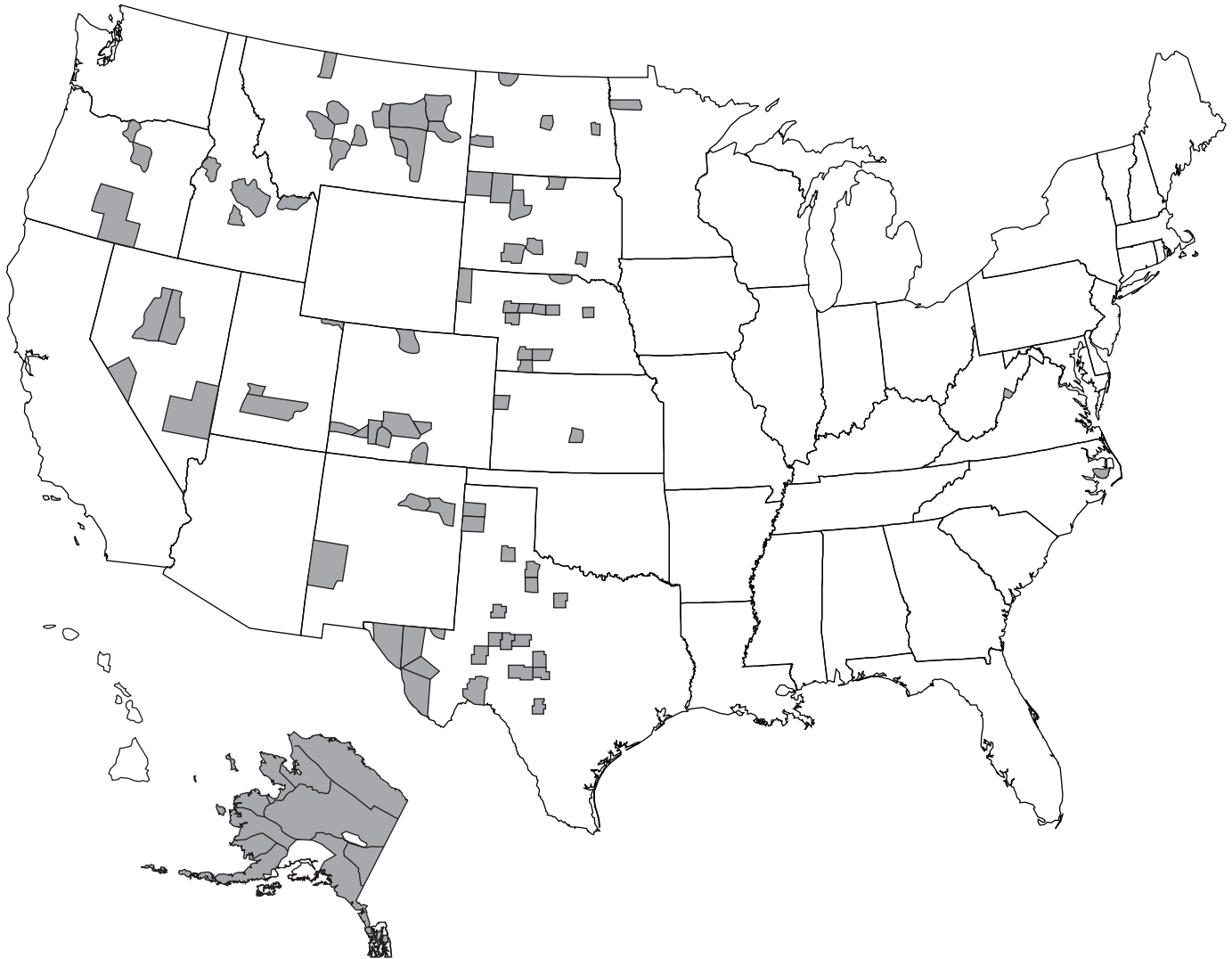
	Beneficiaries in low-access counties	Total Part D
Number of fills	874,030	1,255 million
Share dispensed by a pharmacy classified as:		
Retail	84%	79%
Mail order	3	8
LTC	6	10
Other	7	3

Note: LTC (long-term care). Other includes physician offices, specialty pharmacies, home infusion, durable medical equipment, nuclear, federally qualified health centers, rural health clinics, Indian Health Service, and hospitals. N= 21,174 beneficiaries in low-access counties.

Source: Acumen and MedPAC analyses of 2008 Part D prescription drug event data from CMS.

**FIGURE
5-2**

**100 counties where most beneficiaries drive 18 miles
or more to the nearest Part D pharmacy**



Note: Beneficiaries in the shaded counties are 18 or more miles on average from the nearest pharmacy participating with a Part D plan. There are individuals with long driving distances in other counties such as in Wyoming, but we selected the highlighted counties because a majority of beneficiaries in these counties had long driving distances. In the unshaded counties, the average distance is less than 18 miles, though there still could be individual beneficiaries with more than an 18 mile travel to a pharmacy.

Source: Acumen analysis of 2008 Part D denominator file, Pharmacy cost file, and National Council for Prescription Drug Programs (NCPDP) for MedPAC.

of the more than 5,600 pharmacies used by beneficiaries in low-access counties, only 26 pharmacies located in rural, low-access counties dispensed 17 percent of all prescriptions for this population, representing an average of 5,590 fills per store. These rural, low-access county pharmacies' significant volume suggests that the Medicare beneficiaries who use those pharmacies fill a significant share of their prescriptions at them.

The data indicate that rural beneficiaries enrolled in Part D were able to get needed medications, despite

sometimes having to travel long distances to use retail pharmacies. They used multiple pharmacies but detailed data analyses show that they relied primarily on relatively close pharmacies if such facilities were available. No beneficiaries in our rural focus groups mentioned having difficulty accessing prescription drugs.

While most rural pharmacy closures have been in communities with competing pharmacies, the loss of a pharmacy may affect pharmacy coverage at local hospitals

**TABLE
5-13**

Number of pharmacies used by beneficiaries in low-access counties by pharmacy type and location

Pharmacy location	Number of pharmacies	Percent of fills for beneficiaries who live in LACs	Average number of fills for beneficiaries who live in LACs per pharmacy
All pharmacies with fills for LAC beneficiaries	5,614	100%	155
Nonrural pharmacies	5,007	49	85
Rural pharmacies	607	51	739
Rural pharmacies in LACs	26	17	5,590

Note: LAC (low-access county). N=21,174 beneficiaries.

Source: Acumen analysis of 2008 prescription drug event data for MedPAC.

that do not employ full-time pharmacists. If the number of pharmacists at freestanding small-town pharmacies declines, or if the willingness of retail pharmacists to supervise pharmacies at hospitals declines, there may be a need to expand telepharmacy services where urban hospital pharmacists review pharmacy orders at rural hospitals that do not have in-house pharmacists. Recent experience with telepharmacy shows some promise. The Commonwealth Fund conducted a report on North Dakota’s Telepharmacy Project and found that it extended access to patients in their rural communities and was economically sustainable (McCarthy et al. 2008). Initiated in 2002 and still in operation today, the Telepharmacy Project features live, interactive videoconferencing to enable pharmacists at central sites to supervise pharmacy technicians at remote sites; provide patient counseling; and order, verify, and approve prescriptions. When this study was conducted, there were more than 50 retail telepharmacy sites and 25 critical access hospital (CAH) sites that received pharmacist support via teleconferencing in North Dakota. In the case of the retail sites, the remote sites generated enough additional revenue through pharmaceutical sales to fund their costs and the time of the supervising pharmacist. All remote pharmacy sites became self-sustaining after their first year of operation, and over the course of the project, none of the remote sites closed (Peterson 2011b). This could be a promising way to give residents of small towns not only access to pharmaceuticals but also access to pharmacist expertise.

Satisfaction with access is reasonably high

We examined satisfaction with access to care to determine the extent to which beneficiaries report difficulties with

any aspect of routine or urgent care with their physician or hospital when needed. Several questions that address access to care were posed to Medicare beneficiaries in the 2008 MCBS. For example, respondents were asked to evaluate their ability to obtain care during off hours on nights and weekends, the relative ease of getting to the doctor from their home, and the quality of the communication from their doctors about their health care. Rates of satisfaction with access from place of residence and communication with physicians (this addresses whether the health information being communicated is accessible to the patient) tended to be very high, regardless of where beneficiaries lived. Results are not shown, but more than 90 percent consistently reported satisfaction (response levels: satisfied and very satisfied) with these measures of access. Satisfaction with the ability to access services on nights and weekends tended to be more moderate, although most of the beneficiaries indicated that this question did not apply to them. Overall, rates of dissatisfaction (response level: dissatisfied and very dissatisfied) were low (Table 5-14). However, access to care during off hours (nights and weekends) was problematic for more rural beneficiaries, particularly those in rural micropolitan and nonadjacent counties. More beneficiaries in urban and rural micropolitan counties were dissatisfied with communication with their physician about their care. Dissatisfaction rates tended to be higher in micropolitan counties overall, but particularly with availability of care by specialists. It is noteworthy that dissatisfaction with communication was far lower in rural nonadjacent counties than in other counties, suggesting the success of the “high-touch” nature of care in these counties.

**TABLE
5-14**

Few beneficiaries are dissatisfied with measures of access to care

Share dissatisfied with:

	Available on nights and weekends	Ease of getting to the doctor from residence	Communication of information about health care	Availability of care by specialists
Metropolitan (urban)	3.6%	4.4%	5.0%	3.4%
Rural micropolitan	6.2	7.0	5.8	6.9
Rural adjacent	4.8	6.0	4.7	3.1
Rural nonadjacent	6.3	4.0	2.6	4.7

Note: Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, and rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people. N=13,393.

Source: 2008 Medicare Current Beneficiary Survey.

The survey also asked beneficiaries whether they experienced any trouble getting health care. Only 4 percent (596 of 13,393 people) indicated that they had any difficulty. A few beneficiaries reported that they had trouble accessing health care because their services were not covered by insurance or because the physician would not treat them or would make them wait an unreasonable amount of time. The reported rates were too small to permit meaningful comparisons between subgroups of rural areas. But given the most common reasons for reduced access in rural areas—transportation and cost—we explored the differences between overall rural and urban reasons for reduced access. Among the 596 beneficiaries who reported any difficulty, 161 indicated that cost was a problem, while 112 said transportation was their main source of trouble. In a breakout of results for rural and urban beneficiaries, cost and transportation were identified as barriers in nearly identical proportions: 1.3 percent and 0.6 percent, respectively, for urban beneficiaries compared with 1.6 percent and 0.6 percent, respectively, for rural beneficiaries. Even among the 4 percent of beneficiaries who reported any difficulty with access, there did not appear to be meaningful differences between urban and rural residents.

Beneficiaries were asked in the MCBS whether they have a usual source of care available. An overwhelming majority responded that they do—approximately 95 percent—and there are no significant differences between urban areas and the three rural groups. This finding was confirmed in the Commission survey conducted in 2010 in which 93 percent of respondents indicated they do

not need a new primary care physician. No significant differences were found between urban and rural areas.

The Commission conducts an annual telephone survey of current Medicare beneficiaries to assess their access to care. Much like the MCBS, the telephone survey reflects a random, nationally representative sample of beneficiaries. The rural–urban comparison for this sample is determined by the Office of Management and Budget’s core-based statistical area designation, which is factored into the urban influence code taxonomy used by the USDA.⁷ In our 2010 survey, Medicare beneficiaries reported similar satisfaction with wait times for routine and emergent doctor’s appointments (Table 5-15, p. 140). Among rural beneficiaries, 72 percent reported that they never had to wait for an appointment for routine care, compared with 76 percent of urban beneficiaries. The difference is statistically significant, suggesting that rural residents were slightly more likely to encounter a problem with wait times. However, on every other measure, rural–urban comparisons showed either no difference or rural residents with slightly more positive perceptions of access. A similar share of rural and urban beneficiaries reported looking for a new physician (6 percent and 7 percent, respectively), and among these beneficiaries, a similar share reported some difficulty finding a physician who would treat them. Rural beneficiaries did not report any more difficulty finding a specialist than a primary care physician, suggesting that rural beneficiaries travel the necessary distance to seek and receive care for specialist services.

**TABLE
5-15**

Access to physician care reported by Medicare beneficiaries in urban and rural areas, 2010

Survey question	All	Rural	Urban
Unwanted delay in getting an appointment: Among those who needed an appointment in the past 12 months, "How often did you have to wait longer than you wanted to get a doctor's appointment?"			
For routine care			
Never	75%	72%*	76%*
Sometimes	17	19	17
Usually	3	4	3
Always	2	2	2
For illness or injury			
Never	83	83	83
Sometimes	13	14	12
Usually	2	1	2
Always	1	1	1
Looking for a new primary care physician: "In the past 12 months, have you tried to get a new primary care doctor?"			
Yes	7	6	7
No	93	94	93
Getting a new physician: Among those who tried to get an appointment with a new primary care physician or a specialist in the past 12 months, "How much of a problem was it finding a primary care doctor/specialist who would treat you? Was it..."			
Primary care physician			
No problem	79	83	78
Small problem	8	3	9
Big problem	12	13	12
Specialist			
No problem	87	85	88
Small problem	6	10	5
Big problem	5	5	5
Not accessing a doctor for medical problems: "During the past 12 months, did you have any health problem or condition about which you think you should have seen a doctor or other medical person, but did not?"			
(Percent answering "Yes")	8	8	8

Note: Numbers may not sum to 100 percent because missing responses ("Don't know" or "Refused") are not presented. Overall sample size for Medicare beneficiaries is 4,000. Sample sizes for individual questions varied. These results use the Census Bureau definitions of urban and rural.

*Statistically significant difference between urban and rural areas within Medicare at a 95 percent confidence level.

Source: MedPAC telephone survey conducted from May to September 2010.

Access to mental health services needs further research

It has been argued that rural areas are in greater need of mental health services (de Groot et al. 2010). Depression, for example, is prevalent among older adults, but incidence rates are reportedly higher in rural areas (Institute of Medicine 2004). Depression tends to exacerbate the effects of other comorbid conditions and therefore is important to

address as an area for improvement for rural beneficiaries (de Groot et al. 2010). Yet, fewer mental health care providers (psychologists and psychiatrists, in particular) practice in rural areas than in urban areas. There are also concerns about travel distances to the nearest inpatient psychiatric facility, which can burden the local ambulance company transporting patients from rural communities to psychiatric hospitals.

Claims analysis shows that a comparable share of rural and urban beneficiaries receive some visits for which a mental health concern is the primary diagnosis. Further research is needed to determine whether the beneficiaries are receiving their care from local primary care providers such as nurse practitioners and primary care physicians, from mental health providers in urban areas, or via telemedicine. Research is also needed to determine the relative outcomes for patients who are treated by local primary care physicians compared with subspecialists in mental health. Until we know more about the volumes of mental health care services received and the quality of those services, mental health care in rural areas will remain a concern. One possibility for improving access is using telehealth for mental health services. The use of telehealth in rural areas, particularly the use of telehealth for services that do not require a physical examination such as mental health services, is discussed in the text box (pp. 142–143).

Quality of care in rural areas

In this section we examine the quality of care across different types of rural areas. Because of the inherent diversity among rural areas, we divide urban and rural counties into four categories based on UICs and include a group of frontier counties as we did when we examined access to care. Our data on quality reflect outcomes from services provided in 2009 and 2010. Because measuring quality in Medicare has often focused on hospital care, the preponderance of measures are for the hospital sector.

Summary of findings on quality

We find quality of care is similar for most types of providers in rural and urban areas; however, rural hospitals tend to have below-average performance on mortality and hospital process measures. Beneficiaries report similar levels of satisfaction with the quality of care they receive in rural and urban areas.

Guiding principles for rural quality of care

Over the past year, the Commission has developed two principles to guide our evaluation of the quality of rural health care. Before we present data on the quality of care in rural areas, we present these two principles, which can be used to put the rural quality data in perspective. The principles can also be used to set expectations for the quality of care in rural areas going forward.

Principle 1

Expectations for quality of care in rural and urban areas should be equal for the nonemergency services rural providers choose to deliver. This expectation reflects the belief that for nonemergency care, when there is a choice of whether to treat patients locally or transport them to a larger urban facility, the rural facility should be held to the same standards as the urban facility. The small rural facility should be as good as the alternative site of care.

However, emergency care is different. There may be no alternative, and small rural hospitals are obligated to treat emergent patients. In emergency situations, the expectations for outcomes at small rural hospitals may not be as high as they are for larger facilities. We could ask in these emergency situations if the care delivered was better than having no local emergency care or at least as good as care at similarly sized hospitals. Expectations for emergency services, therefore, should reflect the inherent limitations that exist in small rural hospitals compared with large urban hospitals.

Principle 2

All providers should be evaluated on the services they provide—emergency and nonemergency alike—and the quality of the services should be collected and reported publicly. Most hospitals are currently evaluated on the care they provide to Medicare beneficiaries and their performance is publicly reported on the Hospital Compare website. However, CAHs have the option of not collecting and reporting Hospital Compare data. As the Commission has stated, providers should be evaluated on all the services they provide. This includes measures common among rural and urban providers as well as measures that are specific to rural providers' scope of practice, such as timely communication of patient information after a transfer.

To allow equal access to information for rural and urban patients, all hospitals should be subject to public disclosure of their performance scores. Each small and low-volume provider could pool its data over a number of years to alleviate the concern of random variation in their performance scores. This is a step toward improving accountability and the quality of care delivered in small facilities.

Background on rural quality

The Institute of Medicine has defined quality as the degree to which services for individuals and populations increase

Use of telehealth is limited in rural areas other than for mental health services

Medicare covers telehealth services provided through live, interactive videoconferencing between a beneficiary located at a certified rural site and a distant practitioner. Despite increases in Medicare payment rates for telehealth services and federal grants to encourage telehealth, the number of telehealth services (although growing) remains small. Studies suggest that telehealth is most effective for specialties that rely on verbal discourse and not necessarily physical contact, such as mental health. In addition, there is promise for the use of telepharmacy, where consulting pharmacists supervise remote pharmacy technicians, and tele-emergency care, where central emergency room physicians consult with remote primary care providers treating patients in emergency rooms.

Payment for telehealth services increased in 2001

In January 1999, legislation allowed Medicare to begin paying for telehealth, with a single payment set to the physician fee schedule rate and split between the distant practitioner, who would receive 75 percent of the fee, and the practitioner at the “originating site” (i.e., the site where the patient is located), who would receive 25 percent. Originating sites were limited to practitioners’ offices, hospitals, critical access hospitals, rural health clinics, and federally qualified health centers located in rural health professional shortage areas. Originating sites were required to have a practitioner (e.g., physician, nurse practitioner) present with the beneficiary during telehealth visits. The two practitioners (the distant site and the originating site) objected to having to split the single payment.

In 2001, the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 (BIPA)

attempted to encourage telehealth by reducing regulations and increasing payments. First, BIPA removed the requirement that a practitioner be present at the originating site, so consulting providers no longer had to split the Medicare payment. Second, it required that Medicare pay distant practitioners the same amount for providing telehealth services that they would have received had they provided the service in person. Third, in addition to the fee paid to the distant provider, BIPA required that Medicare make a separate facility fee payment to originating sites. This payment is currently \$24.⁸ The net result is that the system shifted from requiring two providers and making a single payment to requiring one provider and making two payments.

Increased payments did not dramatically increase beneficiaries’ use of telehealth

Despite the increase in payment rates, the volume of telehealth services received by Medicare beneficiaries, although growing, remains very low. Based on our examination of 2009 Medicare claims for telehealth services, we found that beneficiaries made about 38,000 telehealth visits in 2009. Fewer than 400 practitioners provided 10 or more telehealth services to beneficiaries in 2009. The claims data are consistent with information obtained from our site visits to rural communities over the years where providers often have telehealth capability but rarely use it.

The literature cites several reasons for the limited use of telehealth. Common explanations include lack of private payer coverage, thereby discouraging capital investment in telehealth; interstate licensure issues; nonuniform engineering standards; confidentiality and liability concerns; and, in some cases, a perceived lack of need for telehealth services (Abel et al. 2005,

(continued next page)

the likelihood of desired health outcomes (Institute of Medicine 1990). We examine three aspects of quality:

- patient satisfaction
- process measures
- outcome measures

Patient satisfaction is the degree to which patients believe their health care needs were addressed, their questions answered, and their voices heard during an encounter with the health care system. Patient satisfaction scores are metrics that patients and their families easily understand and care about. They reflect how patients feel about the care they received. Incorporating the patient’s perspective

Use of telehealth is limited in rural areas other than for mental health services (cont.)

Institute of Medicine 2004, Johnston et al. 2000, Luo 2008, Whitten and Buis 2006). In addition, the would-be distant practitioners may consider providing telehealth services to be a poor investment of their time (Grigsby et al. 2007). Practitioners with a full workload may decide that telehealth requires more time and effort than they are willing to commit. In addition, telehealth disrupts usual practice patterns, and practitioners may not be interested in adjusting their routines to accommodate it. The cost of managing the daily operation of video networks; the cost of peripheral devices, such as dermatology cameras and digital stethoscopes; and prior adverse experiences in telehealth, such as scheduling issues, cancellations, and technical difficulties with videoconferencing, also may discourage the adoption of telehealth (Luo 2008). Providers may not want to deal with these administrative difficulties if they already have a sufficient population of local patients.

Of the relatively small number of telehealth services provided to beneficiaries, the most common are mental health services, including pharmacologic management. We found that beneficiaries had about 38,000 telehealth visits in 2009. Most of these visits (62 percent) were for mental health services—pharmacologic management (42 percent), individual psychotherapy (8 percent), and psychiatrist diagnostic interview examinations (7 percent). About one-third (31 percent) were office and other outpatient visits. Five percent were for end-stage renal disease services. The remaining 2 percent were for other services. Some of these services may represent improper billing.⁹ Among the 369 distant practitioners that provided 10 or more telehealth services to beneficiaries in 2009, about half (49 percent) were mental health practitioners—psychiatrists (44 percent), clinical psychologists (3 percent), and

licensed clinical social workers (2 percent). About one in five (19 percent) was some other health care professional, including nurse practitioners (13 percent), physician assistants (3 percent), and certified clinical nurse specialists (3 percent).

Evidence of impact of telehealth on health outcomes

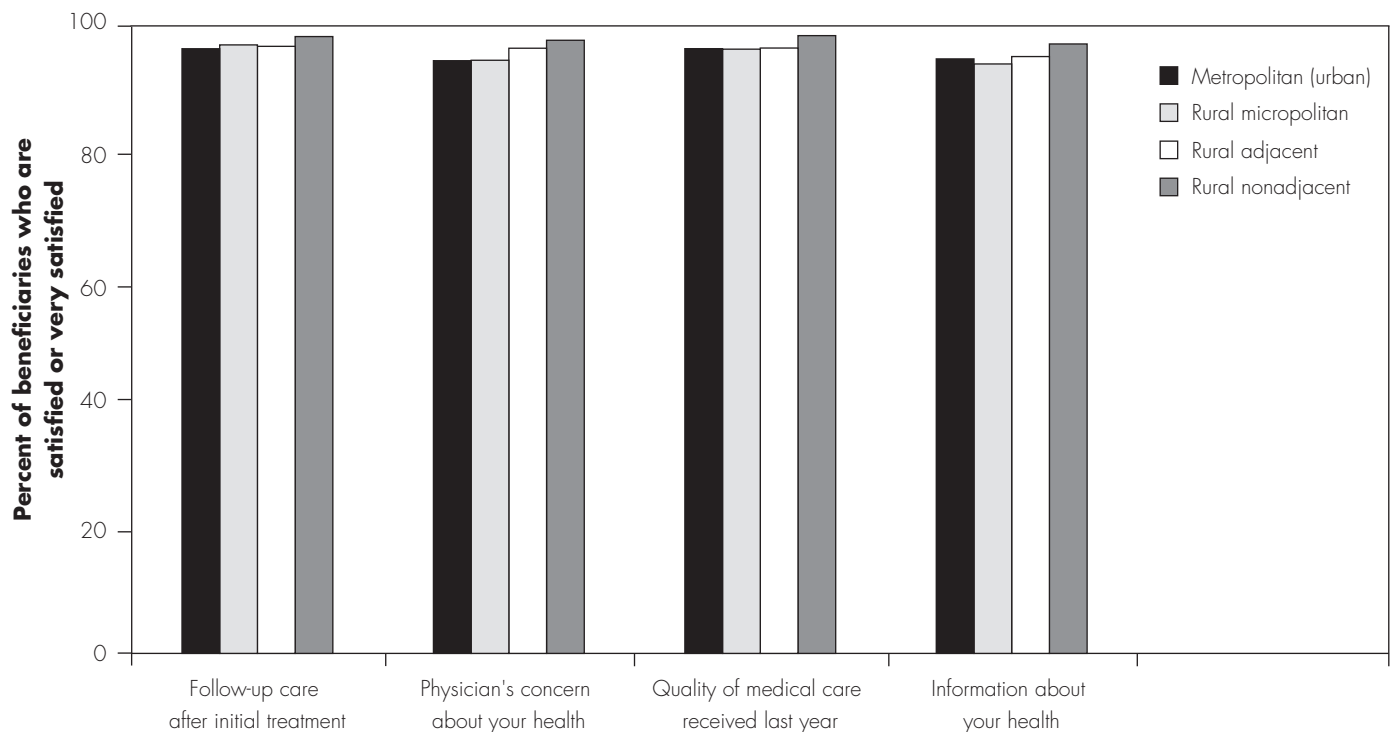
The Agency for Healthcare Research and Quality assessed the body of literature on the efficacy of telehealth for the Medicare population and found that it was most effective for specialties that rely on verbal discourse and not necessarily physical contact, including mental health and neurology (Hersh et al. 2006). For such specialties, services provided via telehealth can probably achieve results comparable to in-person care. Evidence on the efficacy of telehealth in other specialties—including dermatology, ophthalmology, wound care, and gynecology—was mixed or limited.

Some rural emergency departments are using telehealth for rapid consultation with emergency care specialists at distant sites. While the literature on telehealth in emergency departments tends to be conducted by researchers associated with telehealth emergency care programs, the results from these studies are generally positive (Blanchet 2008, Doheny-Farina et al. 2003, Duchesne et al. 2008, Latifi et al. 2007, Ricci et al. 2003, Rogers et al. 2001, Sorondo et al. 2011). Results suggest that telehealth may improve the appropriateness of care through improving access to specialists at trauma centers and may also save money through avoiding expensive transports. Independent studies on the impact of telehealth in emergency departments on health outcomes and costs are needed. ■

as a measure of quality has gained momentum and CMS has begun to include patient satisfaction scores in new payment programs in its attempt to improve patient-centered care.

Process measures are indicators of providers' care practices. For example, the provision of a foot exam, an eye exam, and hemoglobin A1c level checks within the

course of one year are measures of whether an acceptable standard for clinical practice was met for a patient with type II diabetes. Some maintain that for process measures to be good indicators of quality, they must have a causal link to outcomes. Many have found a weak association between outcomes and established process measures for specific conditions (Fonarow et al. 2007, Nicholas et al.

**FIGURE
5-3****Share of beneficiaries who are satisfied or very satisfied with aspects of health care quality, 2008**

Note: Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, and rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people.

Source: Medicare Current Beneficiary Survey, 2008.

2009, Ryan et al. 2009, Werner and Bradlow 2006). Even when there are moderate correlations between process measures and outcomes, there has not been evidence of a strong predictive relationship between adherence to process measures and ideal outcome performance (Bradley et al. 2006). Another caution about process measures is that patients do not place great importance on these measures because they see them as the standard duties of their caregivers. Also, the importance of a specific component of care may simply elude most patients (Rubin et al. 2001). Patients care about outcomes—specifically, whether they get the results they expected upon seeking care.

Providers, on the other hand, favor process measures because the indicators are tied directly to the actions of the provider. Process measures are straightforward and easy to interpret and are a good method for providing feedback on quality improvement endeavors because it is easy for providers to identify what processes they followed or failed to follow. Process measures also have the advantage of often not requiring risk adjustment for patient severity (unlike outcome measures). In addition, they provide an

opportunity to detect flaws in a timely fashion and hence make prompt adjustment. However, there is opportunity to improve the specificity of process measures currently collected on hospital performance. CMS could remove measures that can be answered from check boxes without documentation to confirm that they took place and remove measures that have too many intervening processes before the desired outcome is realized (Chassin et al. 2010). For example, discharge instructions that specify patient care once patients leave the hospital is sound medical practice, but the process measure to indicate whether patients received instructions does not distinguish if the instructions were clear, were easy to understand, or allowed patients to ask questions. Studies have found that simply providing discharge instructions, as opposed to the quality of the discharge instructions, is not correlated with hospital outcomes (Jha et al. 2009).

Outcomes are the end results of care or the effect of the process of care on an individual or population. An example of an outcome measure is whether the patient survived. Patients, and ultimately providers and policymakers, care

**TABLE
5-16****Patient satisfaction measures from Hospital Compare**

	Metropolitan (urban)	All Rural	Rural micropolitan	Rural adjacent	Rural nonadjacent	Frontier
Rate their hospital highly (9-10)	67%	67%	66%	68%	69%	67%
Rate their hospital poorly (0-6)*	9	8	9	8	8	8
Definitely recommend hospital*	70	67	67	68	69	68
Definitely would not recommend hospital*	6	5	5	5	4	4

Note: The location refers to the location of the hospital. Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile.
*Differences are small, though they are statistically significant.

Source: MedPAC analysis of Hospital Consumer Assessment of Healthcare Providers and Systems data. Accessed July 2011.

most about outcomes of care. However, an important consideration when using outcome measures is that outcomes are not entirely under the control of health care providers. Thus, outcome measures might not always reflect the quality of care received (Rubin et al. 2001). Global outcome measures, therefore, must include risk adjustment or case-mix adjustment techniques to adjust for the severity of the patient's illness before seeking care. However, risk adjustment should be limited to patient characteristics to avoid adjusting away differences in performance among providers with different characteristics. Done properly, risk adjustment can help outcome measures be a fairer assessment of the quality of care delivered and reduce bias.

Patient satisfaction in rural and urban areas is relatively equal

We examine patient satisfaction with physicians, the health care system, and hospitals. These indicators of satisfaction reflect patients' perspectives and do not always correlate with data on outcome measures.

Patient satisfaction with physicians and overall care is similar

On average, urban and rural beneficiaries were very satisfied with their physicians and their overall care according to results from the MCBS. Medicare beneficiaries were asked about their satisfaction with follow-up care after receiving treatment, their perceptions about the physician's overall concern about their health, the overall quality of their care during the past year, and their satisfaction with the information they received about their health in general. More than 95 percent of

beneficiaries across all urban and rural groups were satisfied or very satisfied with each of the four aspects of quality of care they were asked about in the MCBS (Figure 5-3).

Beneficiary satisfaction with rural hospitals is mixed

Medicare's Hospital Compare website publicly reports rates of patient satisfaction across several domains for all hospitals. We present performance on the two summary measures of satisfaction with the hospital: how beneficiaries rate their hospital from 0 to 10 and whether they would recommend the hospital. The Hospital Consumer Assessment of Healthcare Providers and Systems survey asks patients to rate their hospital from 0 (poorest) to 10 (best). Most patients (about 67 percent) rated rural and urban hospitals highly. Far smaller similar shares of urban and rural patients (9 percent and 8 percent, respectively) gave their hospitals the lowest ratings (Table 5-16). A slightly higher share of patients from urban hospitals (70 percent) would "definitely recommend" their hospitals compared with patients from rural hospitals (67 percent). However, a slightly higher share of urban patients would also definitely not recommend their hospital (6 percent compared with 5 percent). These differences in Medicare beneficiary ratings are small and suggest similar levels of satisfaction.

Our findings present a paradox. On the one hand, a recent survey found that rural consumers and rural physicians both tend to rank the quality of their local hospitals slightly lower than urban individuals (UnitedHealth Center for Health Reform & Modernization 2011). Consistent with this finding, a 2003 study found that 20 percent of the rural

**TABLE
5-17**

Performance on quality measures in skilled nursing, home health, and dialysis sectors

	Metropolitan (urban)	Rural micropolitan	Rural adjacent	Rural nonadjacent	Frontier
Skilled nursing facilities					
Higher is better					
Share of SNF patients discharged to the community	42%	42%	40%	39%	43%
Lower is better					
Potentially avoidable hospitalizations	19%	18%	19%	18%	16%
Home health agencies					
Lower is better					
Discharge to hospital from home health	31%	31%	32%	32%	30%
End-stage renal disease outcomes					
Higher is better					
Dialysis adequacy for hemodialysis patients	94%	94%	94%	93%	*
Lower is better					
Number of hospitalizations per year	2.0	1.8	1.8	1.8	*
Have a catheter	81%	80%	81%	82%	*

Note: SNF (skilled nursing facility). The five conditions in the measure of potentially avoidable rehospitalization for SNF patients include congestive heart failure, respiratory infection, electrolyte imbalance, sepsis, and urinary tract infection. Higher rates of discharge to the community represent better outcomes. Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile.

*Indicates too few cases to report for adequate comparison for outcomes of end-stage renal disease.

Source: MedPAC analysis of Medicare claims data.

population bypass their local hospital for basic medical admissions, and a 2005 survey of residents near CAHs showed that an average of 32 percent chose to bypass local providers for “primary medical care” (Liu et al. 2008, Radcliff et al. 2003). On the other hand, when hospital patients (not the whole community) are surveyed about their satisfaction, they tend to report equal satisfaction and have reported higher satisfaction for some of the smallest hospitals (Casey et al. 2010a, Flex Monitoring Team 2011). There are at least two possible explanations for this paradox. First, it may be that rural hospital quality is better than the general perceptions of the community and that patients are satisfied when they actually use the hospital. A second possibility is that different patients have different preferences. Those who prefer high-touch over high-tech medicine and like their local physician may prefer the local hospital and be happy when treated there. Other members of the same community may prefer a higher tech approach to medicine or may dislike the local physicians and choose to go to distant hospitals. The result may be that people who use their local rural hospital tend to rate the rural hospital more highly than those who choose not to use it.

Process and outcome measures for post-acute care and dialysis providers

We examined quality for SNFs, home health providers, dialysis facilities, and hospitals, focusing on outcome measures where available. In general, we found similar levels of quality for rural and urban providers.

Skilled nursing facilities’ outcomes do not differ for urban and rural providers

Two measures are used to gauge the quality of care beneficiaries receive in SNFs: the risk-adjusted rate of discharge back to the community and the risk-adjusted rate of rehospitalization for five potentially avoidable conditions (congestive heart failure, respiratory infection, urinary tract infection, sepsis, and electrolyte imbalance). These conditions are considered care sensitive—that is, with adequate monitoring and nursing care, most patients with these conditions can be treated in the SNF without being transferred to a hospital.

The quality of care that most rural beneficiaries received did not differ substantially from the care that urban

beneficiaries received. The rates of community discharge and rehospitalization were similar for rural micropolitan beneficiaries and urban beneficiaries. Beneficiaries living in rural adjacent and rural nonadjacent areas had lower rates of discharge to the community. The small share of beneficiaries living in frontier areas received slightly better care than both urban beneficiaries and beneficiaries living in other rural areas, with higher rates of community discharge and lower rehospitalization rates (Table 5-17).

Home health outcomes are similar for urban and rural home health agencies

The outcome measure we used for the home health sector was the share of patients discharged to a hospital after initiation of home health services (lower rates are better). Urban providers discharge about 31 percent of their patients to a hospital, and other rural areas discharge 30 percent to 32 percent. The differences between urban and different categories of rural areas are slight.

Similar quality of care among urban and rural dialysis facilities

For dialysis patients, process and outcome measures do not appear to differ among urban and rural locations. Rates of hospitalizations are slightly lower in rural areas but these differences are very small. The share of hemodialysis patients who receive adequate dialysis is virtually the same across rural and urban areas. For beneficiaries new to dialysis in 2009, the proportions who had a catheter (where lower rates are better) were similar across rural and urban areas, with rural micropolitan areas posting the best rates of all the groups.

Process and outcome measures for rural hospitals

Having examined patient satisfaction for rural and urban hospitals, we also compared the two groups on other process and outcome measures, focusing more on outcome measures because of potential concerns about differences in coding process measures and the importance of outcomes to patients. Small rural hospitals tended to have lower scores on process measures and higher risk-adjusted mortality.

Hospital process-of-care measures

We used process-of-care measures from the Hospital Compare data that are publicly posted on CMS's website.¹⁰ All prospective payment system (PPS) hospitals are required to participate in Hospital Compare, and CAHs have the option of participating. Reported measures

to evaluate hospital performance are acute myocardial infarction (AMI), congestive heart failure, pneumonia, and surgical care. CMS recently added outpatient measures to the list to capture quality in processes most salient in outpatient care settings. While process-of-care measures have improved for rural and urban hospitals, hospitals in more rural locations still have lower average performance on most process measures (Table 5-18, p. 148). For example, 92 percent of patients in urban hospitals suffering from pneumonia were assessed and given pneumococcal vaccine compared with an average 86 percent in rural hospitals. Among the rural categories, performance declined from 91 percent in micropolitan areas to 77 percent in frontier areas.

Differences in scores were largest for heart failure measures. For instance, the difference between urban and all rural hospitals in rates of heart failure patients who received evaluation of left-ventricular systolic function was 12 percentage points. The above measures include CAH and PPS hospitals. When we examined rural PPS hospitals and CAH performance separately, we generally found slightly lower performance at both rural PPS hospitals and CAHs when compared with urban hospitals. This result is consistent with the literature, which shows that while CAHs and other hospitals improved their process measures over time, a gap remains where CAHs tend to have worse performance scores on process measures than other rural PPS hospitals (Casey et al. 2010a).

Of the seven heart attack process measures on Hospital Compare, very few rural hospitals reported measures for fibrinolytic medication within 30 minutes or percutaneous coronary intervention within 90 minutes. In many cases, small rural hospitals stabilize and transport these patients to a larger hospital rather than admit them. Of the conditions listed in Table 5-19 (p. 149), CAHs posted the lowest response rates for the AMI measures (average response rate for 7 AMI measures was 24 percent). Average CAH response rates were highest for pneumonia (average 86 percent) followed by heart failure (75 percent).

CMS began publicly reporting process measures for surgical care for hospitals that voluntarily participated in 2008. Rural hospitals performed worse than urban hospitals for all the measures for which enough hospitals were reporting to draw conclusions. For the 201 hospitals located in frontier counties, scores on most process measures for AMI, pneumonia, and heart failure were worse than in urban areas and slightly worse than in other

**TABLE
5-18**

Selected hospital process measures

	Metropolitan (urban)	All rural	Rural micropolitan	Rural adjacent	Rural nonadjacent	Frontier
Pneumonia						
Assessed and given pneumococcal vaccine	92%	86%	91%	85%	80%	77%
Given most appropriate initial antibiotic	91	88	90	88	85	83
Initial ED blood culture before first hospital antibiotic	95	92	95	91	90	88
Heart failure						
Received discharge instructions	87	76	82	73	67	56
Evaluation of LVS function	97	85	93	81	74	65
ACE inhibitor or ARB for LVSD	94	86	90	83	81	79
Heart attack/AMI						
Given aspirin at arrival	97	93	95	93	88	91
Given ACE inhibitor or ARB for LVSD	95	89	92	84	86	*
Given fibrinolytic (blood clot) medication within 30 minutes of arrival	46	47	48	*	*	*
Surgical Care Improvement Project						
On beta blockers before or after surgery	91	86	89	79	80	73
Removal of catheters within a day or two	88	84	85	84	81	84
Physician ordered treatments to prevent blood clots	92	86	89	81	83	79

Note: ED (emergency department), LVS (left ventricular systolic), ACE (angiotensin-converting enzyme), ARB (angiotensin II receptor blocker), LVSD (left ventricular systolic dysfunction), AMI (acute myocardial infarction). The data shown include prospective payment system and critical access hospitals; if critical access hospitals are removed, process measures still trend toward lower scores as the gradation of rurality increases. Metropolitan (urban) counties (n=2,764) contain an urban cluster of 50,000 or more people, rural micropolitan counties (n=825) contain a cluster of 10,000 to 50,000 people, rural adjacent counties (n=534) are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties (n=489) are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties (n=201) have 6 or fewer people per square mile.
*Fewer than 30 hospitals reported.

Source: Hospital Compare website, accessed July 2011.

rural areas. On some measures for pneumonia and heart failure, two common clinical conditions at all hospitals, frontier hospitals show significantly worse performance. This does not suggest that the average rates in urban hospitals are optimal but simply states that rural hospitals tend to perform worse than their urban counterparts on these process measures.

Process measures for outpatient care reflect practices delivered in outpatient settings for certain patients (i.e., chest pain, possible AMI, and surgery patients). Regarding the time elapsed between the patient's arrival and the provision of fibrinolytic (blood clot) medication, hospitals in rural areas as a group slightly outperformed urban hospitals, and the difference was statistically significant (Table 5-19). Hospitals in rural areas as a group also outperformed urban hospitals on the average number of minutes for chest pain patients to receive an electrocardiogram. Equal shares of

chest pain patients in rural and urban areas received aspirin within 24 hours of arrival.

For mean minutes for chest pain patients to be transferred to another hospital, rural hospitals posted longer times than urban hospitals. This result was unexpected given that many rural hospitals transfer patients, once they are stabilized, to larger facilities. In some cases, attending physicians in rural hospitals are not on site and have to travel to the hospital after the patient arrives, possibly increasing the total time to transfer (Casey et al. 2008b).

The outpatient process measures primarily reflect the experience of PPS hospitals. CAH participation rates were very low for outpatient measures, with most of the measures showing only 12 percent or 13 percent of CAHs reporting. It is possible that CAHs may be better or worse than these rates suggest.

**TABLE
5-19****Outpatient process measures for all hospitals**

	Metropolitan (urban)	All rural	Rural micropolitan	Rural adjacent	Rural nonadjacent	Frontier
Lower numbers reflect better performance						
Mean:						
Minutes to fibrinolysis	41	37	34	40	38	44
Minutes for chest pain patients to be transferred	92	114	106	128	127	*
Minutes for chest pain patients to ECG	14	11	10	11	12	16
Higher numbers reflect better performance						
Chest pain: Aspirin within 24 hours of arrival	94%	94%	95%	93%	94%	96%
Antibiotic within 1 hour before surgery	90	84	87	76	78	82
Outpatient surgery patients who got correct antibiotic	93	91	92	87	88	*

Note: ECG (electrocardiogram). All rural/urban differences are statistically significant. Metropolitan (urban) counties (n=2,764) contain an urban cluster of 50,000 or more people, rural micropolitan counties (n=825) contain a cluster of 10,000 to 50,000 people, rural adjacent counties (n=534) are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties (n=489) are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties (n=201) have 6 or fewer people per square mile.

*Fewer than 30 hospitals reported.

Source: Hospital Compare website, accessed July 2011.

As we stated earlier in this chapter, there is an inherent diversity among rural areas. They are not homogenous. For process measures in hospital inpatient and outpatient settings, we found that rural micropolitan hospital performance was on par or only slightly below urban hospitals for several measures. However, the rates for rural adjacent areas, rural nonadjacent areas, and frontier areas were lower than for rural micropolitan areas. While there may be some top performers in rural and frontier areas, frontier areas often do not match urban and micropolitan hospitals' adherence to process protocols.

Hospital outcome measures

We examined urban and rural hospital performance on two measures: readmissions and mortality. However, when making these comparisons it is important to understand the effect of hospital size (expressed as the volume of discharges or size of the medical staff) on each measure. The average size and volume of hospitals in each of the rural/urban areas vary, with size and volume getting increasingly smaller the more rural the location (Table 5-20). A long history of research shows a correlation between volume and outcomes (Durairaj et al. 2005,

**TABLE
5-20****Hospital size across metropolitan and rural areas, 2009**

	Metropolitan (urban)	Rural micropolitan	Rural adjacent	Rural nonadjacent	Frontier
Number of hospitals	2,764	825	534	486	201
Mean:					
Number of beds	264	105	39	35	23
Medicare discharges	3,453	1,540	495	458	200
Total discharges	11,052	3,595	1,023	932	430

Note: Metropolitan (urban) counties contain an urban cluster of 50,000 or more people, rural micropolitan counties contain a cluster of 10,000 to 50,000 people, rural adjacent counties are adjacent to urban areas and without a city of at least 10,000 people, rural nonadjacent counties are not adjacent to an urban area and do not have a city with at least 10,000 people, and frontier counties have 6 or fewer people per square mile.

Source: MedPAC analysis of provider of service file, Medicare cost reports and MedPAR files

**TABLE
5-21****Risk-adjusted 30-day mortality is higher in rural hospitals**

Mortality measure	Heart failure		Pneumonia	
	Urban	Rural	Urban	Rural
CMS Hospital Compare	10.8%	11.5%	11.2%	11.8%
AHRQ methods	10.7	12.5	10.2	12.2

Note: AHRQ (Agency for Healthcare Research and Quality). The AHRQ method examines mortality risk using 3M APR-DRG risk of mortality groups. Measures for the median hospital are presented to avoid the influence of outliers.

Source: CMS Hospital Compare of 2008 to 2010 claims and MedPAC analysis of 2010 claims files using AHRQ method for computing risk-adjusted 30-day mortality rates at prospective payment system hospitals.

Institute of Medicine 2000, Keeler et al. 1992, Silber et al. 2010) as we discuss below. For that reason, when evaluating hospital mortality, we divide hospitals into size categories to distinguish volume effects from a rural location effect.

Similar readmission rates among rural and urban PPS hospitals

Our comparison of rural and urban hospital readmission rates, which included PPS hospitals but not CAHs, showed similar rates for the two groups. The median urban hospital's readmission rate across all conditions, heart failure cases, and pneumonia cases was less than 1 percentage point lower than the rural average. Similarly, we did not see consistent differences across the major categories of hospital size, suggesting that there was not a large volume-outcomes relationship for readmissions. This finding on size and volume is consistent with earlier studies (Klug et al. 2010). However, as we discuss later, we see some difference in readmission rates for the CAHs with the smallest medical staffs.

Mortality rates somewhat higher in rural PPS hospitals than in urban hospitals

We focused our comparisons of mortality at PPS hospitals on pneumonia and congestive heart failure. We present these two measures because they are common conditions in even the smallest rural hospitals. Rural PPS hospitals had somewhat higher mortality rates for these two conditions than urban PPS hospitals (Table 5-21). We show two methods of measurement for each condition: The first row is from Hospital Compare, and the second uses the Agency for Healthcare Research and Quality (AHRQ) risk-adjustment method.

Under either method of measurement, rural hospitals have somewhat higher mortality rates than urban hospitals, although the effect is less pronounced in the CMS measure. The CMS measure is designed to avoid the risk of having random variation categorize an individual provider as a top performer or a poor performer. To accomplish this, CMS presents data that are a blend of the experience of the subject hospital and the average experience in the country. For a smaller hospital, less of its information is used and more of the national average is used. "In essence, the predicted mortality rate for a hospital with a small number of cases is moved toward the overall U.S. national mortality rate for all hospitals" (Centers for Medicare & Medicaid Services 2011). The net result of this method is to compress reported values toward the mean (Silber et al. 2010). The AHRQ method we used reports only data from the subject hospital, does not compress differences across classes of hospitals, and is more appropriate for comparing aggregate rural and urban quality. The CMS method may be less likely to mislabel a single hospital as a poor performer, but it understates differences across categories of hospitals, such as low-volume and high-volume hospitals or rural and urban hospitals.

Because rural hospitals tend to be much smaller than urban hospitals, the difference in mortality rates could partially reflect a volume-outcomes relationship and not just a rural/urban effect. For that reason, we divided PPS hospitals into size categories (Table 5-22). Under the AHRQ method, the median rural hospital compared with the median urban hospital has a 2 percentage point higher risk-adjusted heart failure mortality rate (12.5 vs. 10.7) and pneumonia mortality rate (12.2 vs. 10.2). Much of this difference is due to differences in volume. The difference

**TABLE
5-22**

PPS hospital risk-adjusted mortality rates, by rural and urban status

Discharges	Heart failure				Pneumonia			
	AHRQ method		CMS method		AHRQ method		CMS method	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1,001–2,000	11.8%	13.8%	11.0%	11.6%	12.3%	13.7%	11.6%	11.8%
2,000–4,000	11.8	12.8	11.3	11.5	10.9	12.4	11.5	11.9
4,000–8,000	10.9	12.0	11.0	11.4	10.7	11.3	11.4	11.9
Over 8,000	10.4	10.9	10.7	11.2	9.9	11.0	11.0	11.7
All sizes	10.7	12.5	10.8	11.5	10.2	12.2	11.2	11.8

Note: PPS (prospective payment system), AHRQ (Agency for Healthcare Research and Quality). Medians are presented to limit the influence of outliers. Results were similar in 2007, 2008, and 2009. The AHRQ method shows more variation based on size because the method used by CMS blends small hospital-specific performance with average performance by all hospitals, thus masking any differences in mortality that may be due to size (Silber et al. 2010). Thus, the CMS mortality data are not appropriate for comparing outcomes at rural and urban or small and large hospitals. We did not examine PPS hospitals with fewer than 1,000 discharges because of the small sample of hospitals. Differences in hospital size and rural status were found to both be statistically significant ($p < 0.01$) when tested in a series of linear regression models where risk-adjusted mortality was the dependent variable and the independent variables were discharge volume, system membership, a rural indicator, and hospice use in the county.

Source: MedPAC analysis of 2010 claims files using AHRQ methodology for computing risk-adjusted mortality rates.

in mortality rates shrinks to 1 percentage point or less when comparing the largest rural and urban hospitals (10.9 vs. 10.4 for heart failure and 11.0 vs. 9.9 for pneumonia). While much of the rural/urban difference is explained by the volume effect, rural providers still have slightly higher risk-adjusted mortality even after controlling for volume and hospice use.¹¹

Outcomes among critical access hospitals

Given the volume–outcome relationships in our analysis and in the literature, we decided to examine the relationship between volume and outcomes in the smallest rural hospitals to see if there is a need for particular concern with respect to very low volumes. We compared CAHs of different sizes with the same AHRQ risk-adjusted mortality methods described earlier. The reason we compared CAHs with CAHs is because they have similar incentives for coding, which could avoid distortions that may occur when comparing risk-adjusted quality of a CAH with a PPS hospital that may have an incentive to more fully code comorbidities.

We divided CAHs with available data into three categories: those with fewer than 5 admitting providers (290 CAHs), those with 5 to 10 admitting providers (497 CAHs), and those with more than 10 admitting providers (200 CAHs). The CAHs with more than 10 admitters had an average of 1,250 admissions per year, compared with the smallest

CAHs, which had fewer than 5 admitters and an average of 300 admissions per year. We categorized CAHs by the number of admitting providers rather than by the volume of cases because it indicates the number of colleagues a rural physician has to consult with and it also eliminates some statistical issues with respect to measuring the effect of size on readmissions.¹² We found that CAHs with more than 10 admitters had risk-adjusted mortality rates that were 1 to 2 percentage points lower than the CAHs with fewer than 5 admitting providers. Likewise, readmission rates were lower at the larger CAHs. Clinicians at CAHs with fewer than five admitters may be challenged by having few colleagues on the medical staff to share ideas with, and the staff of the hospital may simply have less practice treating particular conditions because of the small patient load. We do not contend that small CAHs cannot achieve good outcomes; we contend only that they may be less likely to achieve better than average mortality because of limited human resources and fewer cases to learn from as others have noted (Joynt et al. 2011a, Joynt et al. 2011b).

Volume effect has been observed for many years

Twenty years ago, Keeler and colleagues examined rural hospital quality from three angles: mortality, process measures, and subjective opinions of physicians engaged in chart reviews. Across all three dimensions, small

rural hospitals tended to have comparatively poorer performance (Keeler et al. 1992). The study was reported in the *Journal of the American Medical Association* and received substantial criticism from rural health care leaders (Behringer 1993, Buck 1993, Rosenblatt and Hart 1993). Critics argued that Keeler used data from the 1980s and that rural providers could have improved by 1992, the year the study was published. However, a Commission review of 2003 mortality rates showed higher mortality for low-volume rural hospitals compared with high-volume rural hospitals (Medicare Payment Advisory Commission 2005). While both rural and urban hospitals have improved their performance over the years, recent studies continue to show that rural hospitals continue to have slightly worse quality metrics on average, and small CAHs tend to have higher mortality than larger hospitals (Casey et al. 2010b, Joynt et al. 2011a, Silber et al. 2010). None of the studies suggests that there are no high-quality rural hospitals; they just suggest that, on average, outcomes tend to be better at higher volume hospitals, which are often in urban areas.

A key question raised in Keeler's 1992 article that remains unresolved is the extent to which patient volume is a choice for providers. For the most isolated small rural communities, volume is not a choice, as they will always face the difficulties of low patient volumes because of small patient populations in isolated areas. However, Keeler suggested that for some rural hospitals near other rural hospitals consolidation is a choice and could improve outcomes. Some may argue that not merging has impeded increasing volumes and improving outcomes, but others may argue against merging small hospitals and believe that a 15-mile or 20-mile drive is a considerable distance for areas without public transportation (Rosenblatt and Hart 1993). The fundamental choice is between preserving hospitals and increasing average volume per hospital. This choice is exactly the same one that policymakers faced 20 years ago when Keeler presented his findings. To date, Medicare payment policy has come down on the side of preserving most small rural hospitals by providing essentially all small rural hospitals with cost-based reimbursement.¹³

Increased participation of rural providers in quality reporting

To improve quality in the smallest hospitals, those hospitals could increase the measurement of quality indicators and participation in quality-reporting activities. CAHs, for example, are allowed to opt out from reporting quality measures currently posted on Hospital Compare and do not have to prepare the Minimum Data Sets for the

skilled nursing care provided to post-acute patients that is mandatory for other hospitals and SNFs. Not collecting and reporting data may impede research on the quality of care delivered in CAHs and may weaken incentives to improve care. Policymakers will have to decide whether Medicare should facilitate and eventually require public reporting of quality measures for small, low-volume hospitals, perhaps tailoring some measures to fit their unique practice settings.

For all quality measures, there are some measurement and reporting options that CMS could pursue to compensate for the effect of low volume on statistical reliability. One method is to pool the data over a number of years on current measures for low-volume providers (Coburn et al. 2009). This option has the benefit of enabling broad-based comparisons across large and small providers with data that are more stable—that is, less prone to random variation. Another option is to examine groups of providers (e.g., a set of all CAHs in a system); this practice eliminates the issue of small numbers.

Reporting metrics most relevant for rural patients

The quality metrics tailored to small rural hospitals should focus on the unique needs and concerns of patients in those hospitals. The metrics reported may differ in rural and urban areas because the types of care provided in smaller rural hospitals may differ from the types of care in larger hospitals. For example, a hospital that provides care to pneumonia patients but does not admit AMI patients would be judged on how it performed on pneumonia care based on process and outcome measures, including mortality. Another option is to develop and adopt quality measures that are better suited for low-volume providers and small hospitals. Some of this work, funded by the Office of Rural Health Policy, is under way, and the National Quality Forum has endorsed the “timely communication of patient status once the patient is transferred measure,” which addresses a core competency and scope of practice for small hospitals. Other measures, such as the availability of physicians and pharmacists in the hospital, represent concerns that are unique to patients in rural hospitals and could become rural-specific quality metrics.

Rural patients may have different concerns about staffing than patients at urban hospitals. For example, the smallest rural hospitals often lack 24-hour pharmacy coverage. This deficiency could contribute to medication errors due to lack of a pharmacist's review of medications

before drug administration (Casey et al. 2008a, Cochran et al. 2008). Rural hospitals, including CAHs, could be evaluated on the percentage of time that a pharmacist reviews medications before administration of the first dose of medication or within 24 hours of administration (Health Resources and Services Administration 2011, Peterson 2011a). In a 2005 study of evidence-based safe medication practices in hospitals with 50 or fewer beds, it was reported that 85 percent of hospitals with an average census over 5 had medication orders reviewed by a pharmacist within 24 hours, but only 49 percent of the hospitals with a lower census had pharmacist review within 24 hours (Cochran et al. 2008). Given the feasibility of telepharmacy, CMS could move toward requiring medications to be reviewed by pharmacists in the smallest rural hospitals, just as they are in larger facilities with 24-hour pharmacist coverage. An alternative would be to collect data on pharmacist review to determine whether small hospitals that generally have pharmacists review medications before they are administered have fewer medication errors and better outcomes than small hospitals that generally do not have pharmacist review of medications.

A second challenge that may be contributing to poorer outcomes at the smallest rural hospitals is the lack of a physician on site. While urban patients may be concerned about wait times at an emergency room because of overcrowding, a rural patient may be concerned about arriving at an emergency room without a physician present. While some CAHs choose to keep physicians on site 24 hours a day, CAH conditions of participation do not require a hospital to have a physician or registered nurse on site and allow CAHs to operate with a licensed practical nurse on site and a physician assistant or nurse practitioner available within 30 minutes. In a national survey of hospitals with fewer than 100 beds, 38 percent reported that a physician was not always present in the hospital when they were primarily responsible for emergency room coverage (Casey et al. 2008b). One rural-relevant measure could be the time between the patient entering the emergency room and the time the physician or other medical professional arrives at the hospital or the time the patient receives a diagnostic evaluation (Moscovice and Casey 2011). As we heard on our site visits, dealing with a trauma case or other emergency without a physician present can be stressful for the patient and the nurse at the emergency room as they wait for the physician to drive to the hospital. One potential source of assistance is a tele-emergency room connection to a larger hospital, an approach that has shown some success. In

these cases, the nurse, physician assistant, or rural primary care physician in the emergency room could receive assistance from an emergency room specialist at a distant site who is monitoring the case via a teleconferencing monitor. This has the potential for improving care in rural areas and reducing the stress faced by rural practitioners who often have smaller teams and less specialized training than urban emergency room practitioners.

Payment adequacy and special rural payment adjustments

Rural payment adequacy

Each year, the Commission examines the adequacy of Medicare payments using a common framework across the various health care sectors that serve Medicare beneficiaries and reports its findings to the Congress. The congressional mandate for this rural study requires that we specifically examine the adequacy of payments to rural providers. In public meetings in December 2011 and January 2012, we discussed payment adequacy in general and rural payment adequacy specifically. We found that Medicare payments to rural providers were generally adequate. For a more detailed discussion of our findings on the adequacy of rural Medicare payments to hospitals and other health care sectors, see the Commission's March 2012 report (Medicare Payment Advisory Commission 2012).

Across sectors, we found that most payment adequacy indicators—such as access to care, quality of care, access to capital, and Medicare profit margins—were similar in rural and urban areas. For example, rural and urban freestanding home health agencies and SNFs tended to have similar margins on Medicare patients, with some having relatively high margins.¹⁴ Volumes of SNF and home health services per capita were also similar. When we examined the adequacy of physician payments, we found that volumes of service, ability to obtain appointments with existing and new physicians, and satisfaction with access were similar in rural and urban areas. In addition, the literature and our site visits indicated that physician incomes are comparable in rural and urban areas, with rural primary care physicians earning roughly equal incomes per hour worked. Research by the Center for Studying Health System Change found that rural physicians have slightly higher incomes but work about 2 hours more per week on average, and some rural physicians have greater on-call burdens (Reschovsky and

Staiti 2005). Adjusting for hours worked, rural and urban primary care physician incomes were roughly equal, and adjusting for hours worked and the cost of living resulted in higher adjusted incomes in rural areas. Together, these findings suggest that rural physician payments are adequate relative to urban payments. We also found that hospice, inpatient rehabilitation facility, and dialysis payments appeared adequate. However, as we discuss in the March 2012 report, evaluation of the new low-volume adjustment provided to dialysis facilities is needed and there is potential for restructuring hospice payments for rural and urban providers.¹⁵

While payment adequacy findings over time are consistent for SNFs, home health agencies, physician services, and most other sectors, one area that has changed is the adequacy of rural hospital payments. In 2001, rural hospitals' inpatient profit margins were below urban hospital profit margins, suggesting that Medicare payment rules favored large urban providers (Medicare Payment Advisory Commission 2001). As a result, the Commission recommended increasing rural hospitals' base payment rates up to the rate paid to large urban hospitals, increasing rural disproportionate share hospital payments, and adding a low-volume adjustment for isolated rural providers that lacked economies of scale because they served an area with low population density. The Congress enacted legislation consistent with the Commission's recommendations and enacted a series of other changes that further increased rural payments. These changes to the PPS, along with the CAH program, have improved rural hospitals' financial stability.

Summary of special payments to rural providers

The mandate for this study requires that the Commission examine the adjustments in payment rates that have increased payments to rural providers. We discuss specific examples of special payments in this chapter, but more importantly we discuss a set of principles the Commission has developed over the past year that can be used to evaluate the appropriateness of special payments that exist for different health care sectors. After presenting the principles, we evaluate whether the special payments in each sector adhere to these principles. We then detail the four rural payment adjustments with the largest effect on rural provider payments: CAH payment; sole community hospital (SCH) adjustment; low-volume adjustments to hospitals and other providers; and limits on input price adjustments for physicians, hospitals, and others.

Some of the special payments could be better targeted. In some cases, these payments go to providers that compete with neighboring providers that are also struggling with low patient volumes. By providing special payments to providers that do not need assistance or to low-volume providers that are not the sole providers of access in their community, spending can be higher than warranted. We also find that the magnitude of the special payments is not always empirically justified, resulting in increased Medicare program costs. The cost of the special rural payments exceeds \$4 billion, or almost 10 percent of all rural payments. Of this amount, roughly \$3 billion is borne by the taxpayer and \$1 billion is borne by the beneficiary, primarily through higher cost sharing for outpatient services at CAHs. Targeting the special adjustments as suggested in the Commission's principles may allow for savings for both the taxpayer and the beneficiary, making the program more sustainable and Part B premiums more affordable for beneficiaries. While this report focuses on special payments targeted at rural providers, the Commission has said in other reports that some of the special payments directed primarily toward urban providers (such as medical education payments) could also be better targeted (Medicare Payment Advisory Commission 2010).

Principles for evaluating special payments

A key objective of rural payment adjusters is to maintain access to care. Areas with low population density may have only one small, low-volume provider. In these cases, costs may be above traditional PPS rates because the low population density prevents economies of scale, and the low volume and high costs may be beyond the providers' control. Special payments by federal or local sources may be needed to maintain access to care in these communities. For example, there are special payments for isolated low-volume hospitals, low-volume dialysis facilities, rural psychiatric facilities, and rural health clinics.

However, the current mix of rural payment adjusters does not have an underlying set of principles that tie them together. The adjusters evolved separately, and there is not a clear common framework for how they are intended to work together to preserve access without duplicative overlapping adjustments to providers. In addition, they are not always targeted to the areas with the greatest concerns about access to care. The lack of targeting is associated with Medicare's definition of "rural." Medicare defines rural as all areas outside of metropolitan statistical areas, so many adjustments can apply to rural areas with a single

local provider and to rural areas with many competing local providers. The Commission has created a framework of principles for rationalizing rural special payments that includes targeting providers that are necessary for access, empirically justifying (and not duplicating) payments, and maintaining incentives for cost control.

Principle 1: Target payment adjusters to preserve access

Payment adjusters should be targeted to providers that are necessary to preserve beneficiaries' access to care. Without these providers, local access to care would be lost. Currently, special adjustments often go to all rural providers or to essentially all small providers. This practice ignores the wide variation in provider supply in different rural communities. A common guiding principle for payment adjusters could be to target isolated providers that are a certain distance from competitors and are necessary to maintain access to care. For example, it may be necessary to provide additional payments to a hospital in an isolated area 35 miles or more from other hospitals or a sole physician practice in an area with low population density.

Principle 2: Focus low-volume adjustments on isolated providers

Many of the current adjustments focus on increasing payments to low-volume providers. However, there are two types of low-volume providers. One type is isolated providers that have low volumes because of low population density in their markets. They will have difficulty covering their fixed costs given their low volume of cases. For these providers, low volumes are inevitable and beyond their control. A second type of provider has low volumes because neighboring competitors attract patients away from the low-volume provider. These providers are not necessary for access. It may not be appropriate to provide additional payments to give a low-volume adjustment to two competing low-volume hospitals that are 5 or 10 miles from each other. By focusing low-volume adjustments on isolated providers, rather than making the adjustment available to all providers with low volumes, Medicare can best use its limited resources to serve Medicare beneficiaries.

Principle 3: Empirically justify the magnitude of payment adjustments

The magnitude of the adjustment should be determined empirically. For example, for low-volume providers, there is a need to determine the degree to which the low volume

of patients increases unit costs. When we measure patient volume, we should measure total patient volume rather than just Medicare patient volume because economies of scale depend on total volumes of patients.

The principle is to evaluate the unique characteristics of isolated providers that result in higher costs per unit of service. Payments would be increased by an adjustment that is equivalent to the additional costs. When a provider qualifies for more than one rural payment adjuster, the total additional payments should reflect the total additional costs of care associated with that provider's unique circumstances. Eventually, we should move away from providers receiving duplicative adjustments to overcome a single problem.

Principle 4: Maintain incentives for cost control

It matters not only how much money is paid to rural providers but how it is paid. For example, prospective payment rates put stronger pressure on providers to control their costs. Cost-based payments reduce this incentive. Therefore, cost-based reimbursement could be limited to the most isolated providers with very low case volume and highly variable costs that are hard to predict. For this small set of providers, it may be difficult to predict how much of a fixed adjustment to their Medicare rates is needed to preserve access. In contrast, most rural providers that are targeted for payment adjusters could receive a fixed adjustment to the base prospective payment rate. This adjustment could be based on a percentage add-on to their payment rate or it could be a provider-specific adjustment based on their historic costs. While all hospitals have some incentive to control their costs because they are not paid costs by all providers, these two types of fixed adjustments to Medicare payments maintain stronger incentives for cost control than cost-based reimbursement, because when providers' costs increase, these rural adjustments do not increase.

Characteristics of rural special payments

Table 5-23 (p. 156) provides an overview of rural payment adjusters and the degree to which they adhere to the Commission's principles for evaluating special payments. In general, most adjusters succeed in increasing payments to rural providers, which is important for keeping access to care in certain isolated areas (Medicare Payment Advisory Commission 2005). However, the programs are rarely targeted to isolated providers, and in some cases the magnitude of the payment is not empirically justified.

**TABLE
5-23**

Selected rural payment adjusters

Adjuster	Projected 2011 extra* payments (in millions)	Target isolated providers needed for access?	Empirically justified?	Maintains cost control incentives?
Permanent adjusters				
CAH cost-based reimbursement	\$2,000 ¹	No 16% of CAHs are within 15 miles of other hospitals	Weak yes ² Cost-based payment	Some incentive, but lower incentive than in prospective payment
Sole community hospital: inpatient payments based on historic costs, outpatient 7% add-on	900	Initially, but now can be any distance from a CAH	Weak yes ² Uses historic costs	Yes
Rural health clinic programs	200 ³	Initially ²	Weak yes ³	Weak yes ³
Inpatient rehabilitation hospitals 18.4% add-on	100	No Received by all rural providers	Yes	Yes
Psychiatric hospital 17% add-on	70	No Received by all rural providers	Yes	Yes
ESRD low-volume adjustment (for rural and urban locations)	Starts in 2012	No Received by all low-volume providers	Yes	Yes
Frontier state hospital wage index floor	50	No Received by all providers in a state	No	Yes
Additional telehealth payments	1	No Received by all rural sites	Yes \$24 payment	Yes
Temporary programs (ending between 2012 and 2016)				
Floor on work GPCI and practice expense limits	1,000	No Applies to urban and rural providers	No	Yes
Hospital low-volume adjustment ⁴	400	No Can be next to CAHs	No	Yes
Medicare-dependent hospital	100	No Can be near other providers	Weak yes ² Uses historic costs	Yes
Home health 3% add on	100	No Received by all rural providers	No	Yes
Outpatient hold harmless	80	No Received by all small rural and SCHs	Weak yes ⁵	Yes

Note: CAH (critical access hospital), ESRD (end-stage renal disease), GPCI (geographic practice cost index). GPCI refers to adjustments to estimates of the cost of physician's time.

*"Extra" payments refers to payments above standard prospective payment system rates.

1 Of the roughly \$2 billion in additional payments received by CAHs, roughly half of those payments are funded by the Medicare program (funded by taxpayers and Part B premiums), and half are funded by higher coinsurance (paid for by beneficiaries and their supplemental insurers), as is explained later in this chapter.

2 Basing rural payment adjusters on current costs or historic costs is empirically justified to the degree to which those costs represent the costs of an efficient provider operating in that hospital's situation.

3 Freestanding rural health clinics (RHCs) receive cost-based payments subject to a cap of \$78 per visit. They are in areas that were once rural and underserved, though they can retain their RHC status if the area circumstances change (Office of Inspector General 2005). Hospital-based RHCs receive cost-based payments. Federally qualified health centers also exist in rural areas and receive a fixed payment of \$109 per visit but were not included in this list because they are primarily located in urban areas. An analysis of urban special payments is outside the scope of this chapter.

4 There is also a separate, permanent low-volume adjustment. However, it applies only to hospitals with fewer than 200 discharges and has a minimal effect on spending.

5 Outpatient hold-harmless payments are based on historic payment rates, which were partially based on costs.

Source: MedPAC analysis of claims, cost report, and provider location data. Congressional Budget Office estimates on GPCI and practice expense limitations.

Given that they are not always consistent with our set of principles, they reflect a suboptimal targeting of Medicare payments.

The magnitude of the additional payments is based on an analysis of 2009 and 2010 Medicare claims data trended forward to 2011. For payments based on historic costs, we simulated the payments using the Medicare payment rules for 2011 and claims data from 2010. In the case of CAHs, we estimated that cost-based payments were \$2 billion, or 25 percent, higher than they would have been under a PPS. This estimate was made by comparing the hospitals' cost-based payments with what the CAH would have received if it had been paid under the PPS including applicable SCH and Medicare-dependent hospital adjustments.

Examples of special payment policies

The special payments that have the largest effect on rural provider revenues (and overall Medicare spending) are the CAH program, the SCH program, low-volume adjustments, and adjustments to payments for input prices. All the programs have good intentions, but there may be ways to better target the special payments to address beneficiaries' needs.

Critical access hospitals

The CAH program was established in 1997 to preserve small rural hospitals that are critical to patients' access to care. CAHs must have 25 or fewer acute care beds and operate primarily in rural areas. Each CAH is paid 101 percent of its allowable Medicare costs for inpatient, outpatient, laboratory, and therapy services as well as post-acute skilled nursing care in the hospital's swing beds (acute care beds that can be used for post-acute nursing care). The program has grown from 41 hospitals in 1999 to more than 1,300 hospitals in 2011.

The CAH program keeps hospitals open One goal of the CAH program is to keep hospitals open (Medicare Payment Advisory Commission 2005). After the PPS was introduced, large numbers of rural hospitals closed, primarily among neighboring rural hospitals that did not have sufficient volume to contain costs below PPS rates (Office of Inspector General 2003). When the Office of Inspector General examined closures from 1990 to 2000, they found that 208 rural hospitals closed (8 percent of all rural hospitals) and 296 urban hospitals closed (11 percent of all urban hospitals). In the case of rural closures, the Office of Inspector General found that an alternative source of emergency care was available within 20 miles for 78 percent of the closures, but for some the

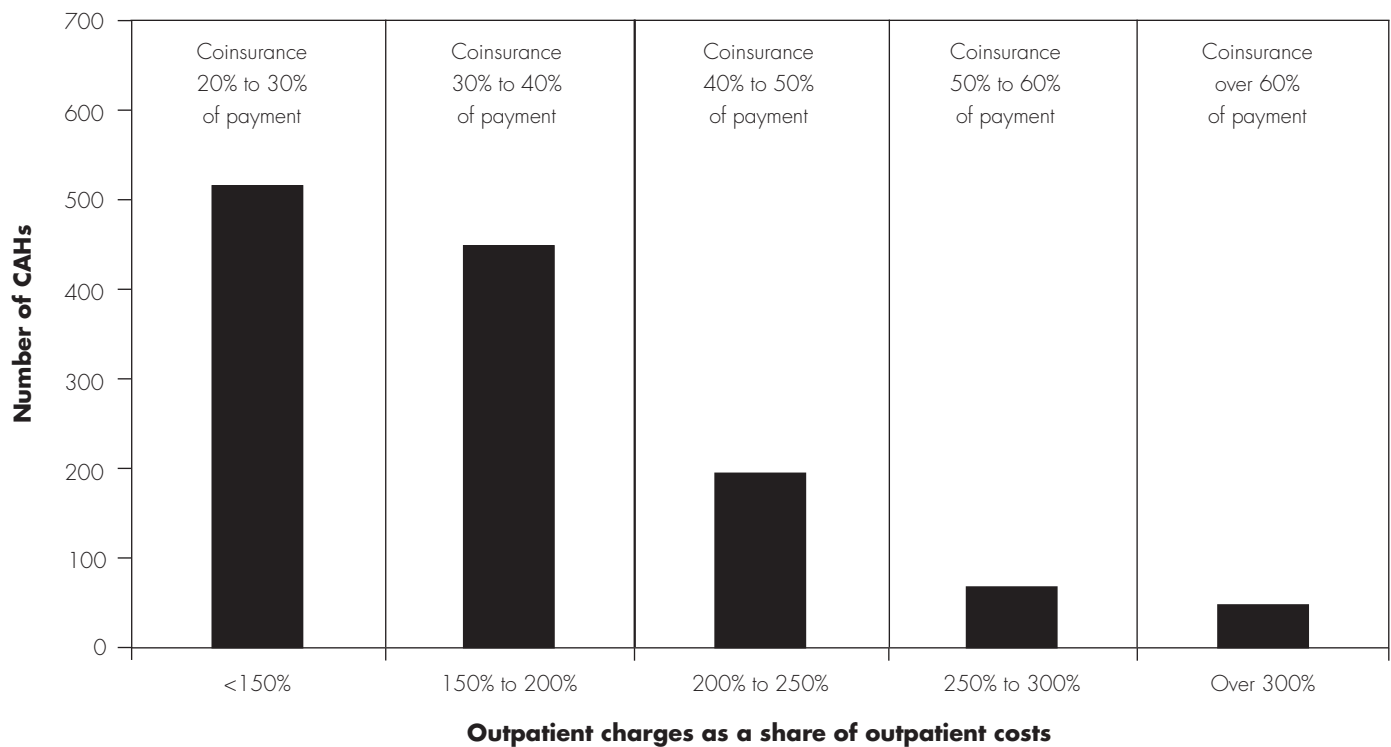
nearest emergency room was 35 or more miles away. With expansion of the CAH program (from 41 hospitals in 1999 to more than 1,300 today) rural hospital closures have almost ceased. We are aware of five rural closures during 2010 and 2011 (three CAHs, one specialty hospital, and one general PPS hospital). In general, these five hospitals suffered from low volumes and financial losses, and all had neighboring competitors within 25 miles.

The CAH program is not targeted to isolated hospitals

Originally, CAHs had to be 35 miles by primary road and 15 miles by secondary road from the nearest hospital or be deemed a "necessary provider" by the state. Because states waived the distance requirement and set up minimal "necessary provider" standards, the CAH program became an option for almost all small rural hospitals with low inpatient volume and therefore is not limited to helping isolated hospitals. The result is that most CAHs entered the program through the exception process (in which states could waive the distance requirement) rather than meeting the distance criteria. Currently, 17 percent of CAHs are 35 or more miles from another hospital, 67 percent are between 15 miles and 35 miles from the next hospital, and 16 percent of CAHs are less than 15 miles from the nearest hospital.

The robust growth of the program and moderate growth rates of outpatient and post-acute care in CAHs have resulted in total CAH payments of \$8 billion in 2010, which were roughly \$2 billion higher than PPS rates for the same services. Almost half of the difference between CAH payments and PPS payment rates was due to higher rates for post-acute care in swing beds, which are used for acute and post-acute care. In 2009, CAHs received an average of \$1,315 per post-acute day compared with \$390 at rural SNFs, resulting in more than \$800 million in additional payments from Medicare in 2009. We expect this amount to grow to \$900 million by 2011. Part of the high rates of payment for swing bed care may be due to overallocating costs to swing bed patients (Medicare Payment Advisory Commission 2005). If costs allocated to swing beds were reduced or capped, then a portion of the reduction in swing bed payments would result in reduced Medicare spending, but a portion of current costs would also be allocated to other Medicare inpatient services, which would increase payments for Medicare acute inpatient stays at CAHs.

Outpatient payments are close to \$1 billion higher than PPS rates; however, at CAHs, most of the higher outpatient payments are paid by beneficiaries through

**FIGURE
5-4****As CAHs raise charges, outpatient coinsurance goes up**

Note: CAH (critical access hospital).

Source: RTI analysis of 2009 Medicare cost reports.

higher cost sharing on outpatient services. Differences between PPS rates and CAHs' cost-based payments for acute inpatient care were roughly \$300 million. The differences for acute inpatient care tended to be relatively small for two reasons: First, many CAHs could receive SCH payments or low-volume adjustments if they were in the PPS. Second, cost accounting rules change when a hospital enters the CAH program, which causes costs to be allocated away from acute inpatient admissions and toward outpatient and post-acute care. This explains why most of the roughly \$2 billion in projected additional payments was due to higher outpatient and post-acute care payment rates at CAHs (Medicare Payment Advisory Commission 2005).

Beneficiaries' outpatient cost sharing is higher at CAHs. While cost sharing for acute inpatient care and post-acute care are the same at CAHs and PPS hospitals, cost sharing for outpatient services is significantly higher in CAHs. Patients (or in most cases, their secondary insurers, such as medigap) pay coinsurance for outpatient services at CAHs equal to 20 percent of the charges. This was

originally the coinsurance policy used for PPS hospitals, but after a 1995 recommendation by the Commission's predecessor, the Congress shifted the coinsurance policy used for PPS hospitals from coinsurance based on charges toward coinsurance equal to 20 percent of the prospective payment amount (Prospective Payment Assessment Commission 1995). CAH coinsurance has remained at 20 percent of charges.

In recent years, both CAHs and PPS hospitals have increased their charges faster than their rate of cost growth. From 2006 to 2009, CAH outpatient charges as a share of costs increased by 13 percentage points up to 235 percent of costs (PPS hospital charges are over 300 percent of costs on average). While charges do not affect the total payment received by the CAH, as the average CAH outpatient markup increases, the beneficiary's share of the total payment continues to increase over time. CAH Medicare patients' coinsurance rose from roughly 44 percent of payments in 2006 to 47 percent of payments in 2009 (Medicare Payment Advisory Commission 2011a). From the individual CAH patient's perspective, it is also

**TABLE
5-24****Charges vary widely by critical access hospital, 2008**

Type of service	Charge at:		Coinsurance at:		
	CAH A	CAH B	CAH A	CAH B	PPS hospital
Level 3 ER visit (CPT 99283, reflects facility fee only)	\$150	\$421	\$30.00	\$84.20	\$34.33
CT scan (head) (CPT 70470)	1,186	1,704	237.20	340.80	116.13

Note: CAH (critical access hospital), PPS (prospective payment system), ER (emergency room), CPT (Current Procedural Terminology), CT (computed tomography). The PPS payment for a CT scan (CPT 70470) was \$334.24, less than the coinsurance alone at CAH B.

Source: *Critical Access Hospital Financial Analyses – 2008*. Draffin & Tucker, LLP. 2008. MedPAC computation of 2008 PPS payments and coinsurance.

important that the distribution of outpatient markups, to which a patient's coinsurance is linked, varies widely, from essentially no markup at some CAHs to more than a 300 percent markup at other CAHs; this difference reflects the hospital industry's wide variation in hospital charge-setting practices (Figure 5-4, Table 5-24). Because markups vary widely, coinsurance varies widely from one CAH to another. For example, a patient receiving a service where charges are 150 percent of costs pays 30 percent of costs as coinsurance, while at a hospital with a markup over 300 percent the patient pays more than 60 percent of costs as coinsurance.

At first, it may appear that hospitals would have been reluctant to increase their charges too high and shift the payment burden to the beneficiary, because the 15 percent of rural beneficiaries without supplemental insurance may be unwilling or unable to pay the coinsurance (Kaiser Family Foundation and Health Research and Educational Trust 2008). However, CAHs received 100 percent reimbursement of Medicare bad debt through 2012, unlike PPS hospitals, which received 70 percent reimbursement of bad debt. Therefore, CAHs received the coinsurance from either the beneficiaries' supplemental insurer (e.g., medigap plan), directly from the patient, or indirectly through Medicare bad debt reimbursement when patients or their supplemental insurers were unable or unwilling to pay the coinsurance. This practice will change starting in fiscal year 2013 when both PPS hospitals and CAHs will move toward receiving a smaller share (65 percent) of their bad debts paid by Medicare because of a provision in the Middle Class Tax Relief and Job Creation Act of 2012. At that time, hospitals will no longer be able to raise charges and associated beneficiary coinsurance and be assured that they will receive the full cost sharing due from the beneficiary. We will have to examine data from 2013 and later years to evaluate whether some hospitals with

particularly high charges reduce their charge structure to reduce uncompensated bad debts from Medicare patients.

Sole community hospital payments

The SCH designation is available to hospitals that are 35 miles or more from the nearest PPS hospital or that meet other criteria indicating they are an area's sole source of inpatient care. While SCHs must be isolated from other PPS hospitals, they can be located any distance from CAHs. Therefore, with the shift of many small hospitals to CAH status, the SCH program targeting has weakened.

The primary benefit of SCH status is to have inpatient payments based on the provider's historic costs and updated for inflation. The SCH can pick among several years to set its historic costs, and it picks the highest cost year on which to base payments. Because the SCH program sets rates based on historic costs trended forward (rather than current costs), SCHs maintain a stronger incentive (relative to CAHs) to restrain current costs. The 420 SCHs received roughly \$8 billion in Medicare payments in 2009. In 2011, the SCH program is expected to increase inpatient payments by approximately \$800 million relative to what these hospitals would have been paid under standard PPS rates. In addition, SCHs receive a 7 percent increase in outpatient payments, resulting in roughly \$100 million of additional payments. The net total increase in payments in 2011 will have been roughly \$900 million.

Low-volume adjustments became much more generous in 2011

In our 2001 rural report, the Commission recommended that the Congress require the Secretary to create a low-volume adjustment for hospitals that are more than a specified distance from other facilities. The Congress

**TABLE
5-25****Low-volume policy favors hospitals with larger non-Medicare shares**

Type of hospital	Discharges			Low-volume adjustment
	Medicare	Private payer and other	Total	
Hospital A: high Medicare share (70%)	1,500	600	2,100	2% increase
Hospital B: low Medicare share (30%)	600	1,500	2,100	18% increase

Note: Data were rounded from two hospitals that would have qualified for the low-volume payment based on their 2009 Medicare volume.

Source: MedPAC analysis of CMS data.

enacted a low-volume adjustment in 2003 but left implementation up to the Secretary as the Commission recommended. The Secretary then determined that only hospitals with fewer than 200 total discharges that are more than 25 miles from another hospital warrant a low-volume adjustment. Because many of the smallest hospitals are CAHs, the low-volume adjustment applied to two PPS hospitals in 2010.

In 2010, the Congress enacted a new low-volume adjustment for hospitals that are 15 miles or more from another PPS hospital. The program is not focused on isolated hospitals because low-volume hospitals can be any distance from CAHs. Rather than leave the eligibility criteria up to the Secretary, the Congress mandated that inpatient payments increase for any hospital with fewer than 1,600 Medicare discharges. PPS payments are increased by 25 percent for hospitals with 200 or fewer Medicare discharges, with the adjustment declining linearly until it phases out for hospitals with 1,600 or more Medicare discharges. For example, a hospital with 200 Medicare discharges gets a 25 percent add-on, a hospital with 900 Medicare discharges gets a 12.5 percent add-on, and a hospital with 1,600 Medicare discharges receives no add-on. There were 529 hospitals that received the adjustment in 2011, representing roughly half of all rural PPS hospitals. There are several issues with this adjustment:

- The empirical support for the magnitude of the low-volume adjustment is unclear; the adjustment is larger than past estimates of the effect of volume on inpatient costs.
- The adjustment is added on top of SCH cost-based payments, which already increase payments based on a hospital's historic costs. Therefore, a hospital can

be paid its historic costs, plus inflation, plus a low-volume adjustment of up to 25 percent.

- The adjustment is based on Medicare discharges rather than total discharges. Economies of scale depend on total discharges (not just Medicare discharges), so the adjustment has a weaker connection to a provider's problem with economies of scale than an adjustment based on total discharges. Basing the adjustment on Medicare discharges also discriminates in favor of hospitals with large numbers of private-payer patients and against hospitals with larger shares of Medicare discharges (Table 5-25).

Table 5-25 shows the rounded 2009 volumes of Medicare and total discharges for two hospitals and simulates how the low-volume adjustment would affect those hospitals in 2011. Hospital A, with a 70 percent Medicare share, receives only a 2 percent low-volume add-on due to having almost 1,600 Medicare discharges (the limit) out of 2,100 total discharges. Hospital B has the same problem with economies of scale due to having the same levels of total discharges (2,100), but it receives an 18 percent add-on because a small share of its patients are Medicare beneficiaries. Hospital B is unfairly advantaged under the current system, especially if a large share of its non-Medicare patients are highly profitable privately insured patients.

The current low-volume policy based on Medicare discharges expires at the end of 2012. At that point, there may be an opportunity to revisit how to appropriately structure a low-volume adjustment.

Modifications to input price adjustments

In general, Medicare pays higher rates in markets with high input prices (e.g., Boston) and lower rates in

markets with lower input prices (e.g., rural Mississippi). Providers in lower cost markets often object to being paid lower rates. They have succeeded in obtaining several modifications to input price adjustments. These adjustments often help rural areas, which tend to have lower input prices.

How do input price adjusters work? Some inputs have local prices (e.g., nurse labor, rent) that vary by market, while other inputs tend to have national prices (fuel, postage). CMS estimates the share of inputs that vary by region and adjusts Medicare prices accordingly.

What policies have been implemented to prevent downward adjustments? The simplest modification is to set a floor on the input price adjuster of 1. The floor allows for upward adjustment for high wages, for example, but prevents downward adjustments for low wages that fall below the established value of 1. As part of the Patient Protection and Affordable Care Act of 2010 (PPACA), six states with low population densities (frontier states) were given a floor input adjuster of 1 for hospitals (the wage index) and for physicians (the geographic practice cost indexes), which means their payments cannot be adjusted downward because of lower input prices in those states.

A second way to limit the downward adjustment is to reduce the share of expenses that are subject to the wage index adjustment. This reduction has happened for two sectors:

- For hospitals, CMS estimates the share of expenses that are affected by local wage rates. The current estimate is 68.8 percent. However, the Congress mandated that when the wage index is below 1, no more than 62 percent of the payment can be adjusted downward. This policy increases payments to providers in many rural areas where the wage index is below 1 by limiting the share of payment affected by the wage index.

- For physicians, PPACA temporarily limited the share of physician practice expenses that can be subject to the input price adjuster at 50 percent of the empirically estimated amount if the geographic practice cost adjuster is below 1. PPACA also temporarily limits the downward adjustments for estimated physician labor costs below 1. This provision increases payments by roughly \$1 billion per year and expires in January 2012.

A third way to prevent downward readjustment is reclassification, a policy under which the provider is partially or fully paid based on input prices from another location. For example, a rural area in a state could be reclassified from a lower wage rural area to a higher wage urban area of that state via one of the current reclassification mechanisms.

In 2007, the Commission recommended a new way to adjust for input prices that does not rely on exceptions to the current wage index system (Medicare Payment Advisory Commission 2007). The Commission recommended a new wage index system that uses data from all employers to determine regional wage levels for different types of health care industry employees, adjusts for regional differences in benefits, and limits differences between adjacent counties. By smoothing differences between adjacent counties, the new wage index would ensure that competing providers do not have significantly different wage indexes from their competitors. This would eliminate the need for an exceptions process.

Input price adjusters to Medicare payment rates should only reflect differences in input prices. Other policy objectives, such as maintaining access to care in rural areas, should be addressed through other targeted payment adjusters. Better targeting would maintain access without creating distorted incentives that alter the relationship between input prices and Medicare payments. ■

Endnotes

- 1 States well represented in the MCBS sample of rural adjacent areas include: AL, KY, MI, TN, TX, and WV, reflecting areas primarily in the southeastern region of the United States. Very few individuals were from CA, IL, MO, NV, OK, SC, and WI. States represented in rural nonadjacent counties are: IA, MI, MO, OH, PA, TN, and TX.
- 2 The National Health Interview Survey shows that on average rural areas tend to have more individuals who have difficulties with complex activities of daily living. The Centers for Disease Control and Prevention reported that 36 percent of rural individuals reported a limitation with complex activities compared with 30.4 percent in urban areas in 2009 (National Center for Health Statistics 2011). The MCBS data have similar aggregate findings for rural areas. We focus on the MCBS data, which allowed us to examine how rates of difficulty with activities of daily living vary by category of rural area.
- 3 Each year the Commission staff conducts site visits to communities and convenes beneficiary focus groups. In 2010, the Commission conducted focus groups with Medicare beneficiaries in rural communities in Alabama, Kansas, and Montana. The objective was to hear from beneficiaries in areas with different degrees of isolation from urban areas and different local economic circumstances.
- 4 The wide range of service use for the 49 state-wide rural areas is similar to the wide range of service use for the metropolitan statistical areas. Only two urban areas have service use that is significantly higher than any state-wide rural average: Miami, FL, and McAllen, TX. Miami has had very high levels of durable medical equipment billing and McAllen has had very high levels of home health billing. However, this use may be due to higher levels of fraud and abuse in these two urban areas rather than to differences in access to care in these communities compared with other areas of the country.
- 5 For example, in lower cost states such as Minnesota we found that 2008 per capita spending on durable medical equipment in Minneapolis, Rochester, and rural parts of the state was 65 percent, 70 percent, and 70 percent of the national average, respectively. North Dakota, South Dakota, and Wisconsin have similar values. Texas has much higher values in rural and urban areas. Spending on durable medical equipment in Dallas, Lubbock, and rural parts of the state was 113 percent, 147 percent, and 120 percent of the national average, respectively. Likewise, in Louisiana, spending on durable medical equipment in Baton Rouge, Monroe, and rural parts of the state was 118 percent, 122 percent, and 136 percent of the national average, respectively. While there are not consistent rural/urban differences for most types of durable medical equipment, one area in which rural beneficiaries tended to have higher average use was home oxygen. Further research is needed to determine the underlying causes for the differences in use of home oxygen.
- 6 Part D pharmacies were identified using the Pharmacy Cost Files for Part D submitted to CMS for use in the Medicare prescription drug plan finder. Pharmacy types and addresses were identified with information from the pharmacy database from the National Council for Prescription Drug Programs. Rural areas were identified using the 2003 UICs. For purposes of this analysis, rural is defined as nonurban and nonmicropolitan. In addition, we did not include noncore areas that were adjacent to larger urban areas. Of more than 3,000 counties in the United States, 1,248 were classified as rural (UIC 6–7 and 9–12). We calculated (by ZIP code) the share of beneficiaries by county living 15 miles or more from the nearest pharmacy.
- 7 For this survey, the Commission uses the Census Bureau definitions of urban and rural, which classify as urban all territory, population, and housing units located within an urbanized area (UA) or an urban cluster (UC). It delineates UA and UC boundaries to encompass densely settled territory, which consists of core census block groups or blocks with a population density of at least 1,000 people per square mile and surrounding census blocks with an overall density of at least 500 people per square mile. Under certain conditions, less densely settled territory may be part of each UA or UC. The Census Bureau's classification of rural consists of all territory, population, and housing units located outside of UAs and UCs.
- 8 The fee paid to originating sites continues to be adjusted annually for inflation and is not subject to any geographic payment adjustments.
- 9 We contacted two practices that were billing for significant volumes of telehealth services to urban beneficiaries, representing roughly 4 percent of all 2009 claims. Both were billing for video consultations with urban patients in their homes, which is not a covered service. Therefore, our count of distant practitioners may include some practitioners that billed erroneously for telehealth services. Among the 38,000 telehealth claims in 2009, about 16,000 claims do not have a bill from an originating site (e.g., rural hospital), as is allowed by Medicare. These claims could be errant billing by the consulting physician, as was the case for the physician practices we contacted, or cases in which the distant site chose not to bill for the \$24.
- 10 A total of 4,612 hospitals made up our analytic sample from Hospital Compare: 3,495 were acute care hospitals and 1,053 were CAHs. (In total there are about 1,300 CAHs. There

may be selection bias—that is, the more successful CAHs may choose to participate, but we cannot evaluate how large that bias may be.) There are 2,764 urban hospitals, 825 rural micropolitan hospitals, 534 rural adjacent hospitals, and 486 rural nonadjacent hospitals. Separate analyses for frontier counties had 201 hospitals in that category. The data for process measures were collected quarterly from October 2009 through September 2010. In Table 5-3, we show the rates for selected process measures for urban rural micropolitan, rural adjacent, rural nonadjacent, and frontier areas. Measures with fewer than 30 hospitals reporting in each urban/rural category are marked with an asterisk.

- 11 There has been a long-standing concern that higher mortality in rural areas may reflect rural patients' greater likelihood of using a rural hospital as a substitute for hospice care at the end of life. For example, in response to Keeler's article (1992) showing higher mortality at smaller hospitals, some suggested that a larger share of patients at small hospitals may have do-not-resuscitate orders (Buck 1993). Keeler reviewed charts and found a smaller percentage of do-not-resuscitate orders in rural hospitals. Similarly, after the article by Joynt and colleagues (2011a) finding higher mortality in CAHs, it was suggested that there may be less use of hospice in rural areas. For this reason, we have added a control variable to our regressions that indicates the share of patients in a county using hospice. It did not significantly affect the volume–outcomes relationship or the statistical significance of the rural variable in our regression models. Therefore, we do not believe the volume–outcomes relationship simply reflects a lack of hospice use in rural areas.
- 12 We could have divided CAHs by the volume of admissions, but it would create a problem in arguing the direction of causality if we found a correlation between the volume of admissions and readmissions. Do readmissions affect volumes, or do volumes affect quality and readmission rates? By using the number of admitting physicians as the indicator of the CAH's size, we avoid the issue of patient volumes being endogenous.
- 13 If Medicare wanted to facilitate mergers of two neighboring CAHs, CMS may need to create new regulations allowing two merging CAHs to relocate to a common site in between the two neighboring CAHs. For example, two rural towns with CAHs 12 miles apart may want to consolidate their CAHs into a single building located at the edge of one town so travel can be made convenient for members of both communities. New regulations could allow the merging CAHs to pick a building site between two CAHs rather than continuing to use an existing site.
- 14 The services we examined included hospital, physician, skilled nursing, long-term care hospital, inpatient rehabilitation facility, home health agency, and dialysis facility. We focus on freestanding margins instead of including hospital-based facilities because of cost allocation issues and the potential for one department to affect the costs of another department. In the case of home health agencies, we are concerned about the allocation of hospital overhead onto hospital-based home health agencies. With respect to skilled nursing facilities, we do not look at hospital-based facilities in isolation because a hospital-based skilled nursing facility could affect the profitability of inpatient departments if it allows patients to be discharged sooner when a hospital-based facility or swing bed is available in the same facility.
- 15 In March 2009, the Commission recommended that the hospice payment system be reformed. Currently, long hospice stays are more profitable than short stays because Medicare makes a flat payment per day, while hospice service intensity is highest at the beginning and end of the episode. The Commission recommended increasing payment rates at the beginning and end of the episode and decreasing rates in the middle to better match service intensity patterns. In the context of such reforms, it may be worthwhile to explore whether a rural payment adjuster is appropriate. Our March 2012 report on hospice payment adequacy examined hospice use rates among rural beneficiaries and Medicare margins for hospices that serve them (Medicare Payment Advisory Commission 2012). This report found that while hospice use rates among Medicare decedents are lower in rural counties than in urban counties, hospice use has grown substantially across all types of counties over the past decade. Overall, rural hospices have slightly lower Medicare margins than urban hospices, but margins do not decrease as the degree of rurality increases and some hospices provide services to beneficiaries in remote areas with favorable margins. In light of this mixed picture, it is not clear that a rural payment adjustment for hospice is warranted, but it merits further exploration as part of broader hospice payment reform efforts.

References

- Abel, R. L., K. Warren, G. Bean, et al. 2005. Quality improvement in nursing homes in Texas: Results from a pressure ulcer prevention project. *Journal of the American Medical Directors Association* 6, no. 3 (May–June): 181–188.
- Behringer, B. 1993. Quality of care in rural hospitals. *Journal of the American Medical Association* 269, no. 7 (February 17): 865; author reply 866–867.
- Bennett, K. J., B. Olatosi, and J. C. Probst. 2008. *Health disparities: A rural–urban chartbook*. Columbia, SC: South Carolina Rural Health Research Center.
- Blanchet, K. D. 2008. Innovative programs in telemedicine. The Telemedicine Program at Fletcher Allen Health Care and the University of Vermont College of Medicine. *Telemedicine and e-Health* 14, no. 2 (March): 122–126.
- Boyle, K., F. Ullrich, and K. Mueller. 2011. *Independently owned pharmacy closures in rural America, 2003–2010*. Rural policy brief no. 2011–5. Iowa City, IA: RUPRI Center for Rural Health Policy Analysis.
- Braden, J., and K. Beauregard. 1994. *Health status and access to care of rural and urban populations*. AHCPR Publication no. 94–0031. National Medical Expenditure Survey Research Findings 18. Rockville, MD: Agency for Health Care Policy and Research.
- Bradley, E. H., J. Herrin, B. Elbel, et al. 2006. Hospital quality for acute myocardial infarction: Correlation among process measures and relationship with short-term mortality. *Journal of the American Medical Association* 296, no. 1 (July 5): 72–78.
- Buck, R. 1993. Quality of care in rural hospitals. *Journal of the American Medical Association* 269, no. 7 (February 17): 866; author reply 866–867.
- Buczko, W. 1994. Bypassing of local hospitals by rural Medicare beneficiaries. *Journal of Rural Health* 10, no. 4 (Fall): 237–246.
- Casey, M., M. Burlew, and I. Moscovice, Rural Health Research Centers. 2010a. *Critical access hospital year 5 Hospital Compare participation and quality measure results*. Briefing paper no. 26. Minneapolis, MN: University of Minnesota Rural Health Research Center. March.
- Casey, M., M. Burlew, and I. Moscovice. 2010b. *Critical access hospital year 5 Hospital Compare participation and quality measure results*. Policy brief no. 15. Minneapolis, MN: Flex Monitoring Team.
- Casey, M., W. Elias, A. Knudson, et al. 2008a. *Implementation of telepharmacy in rural hospitals: Potential for improving medication safety*. Minneapolis, MN: Upper Midwest Rural Health Research Center.
- Casey, M., I. Moscovice, J. Klingner, et al. 2012. *Relevant quality measures for critical access hospitals*. Policy brief no. 25. Minneapolis, MN: Flex Monitoring Team.
- Casey, M. M., D. Wholey, and I. S. Moscovice. 2008b. Rural emergency department staffing and participation in emergency certification and training programs. *Journal of Rural Health* 24, no. 3 (Summer): 253–262.
- Centers for Disease Control and Prevention, National Center for Health Statistics. 2011. Underlying cause of death 1999–2008 on CDC WONDER Online Database, released 2011. Data for year 2008 are compiled from the Multiple Cause of Death File 2008, series 20 no. 2N, 2011, data for year 2007 are compiled from Multiple Cause of Death File 2007, series 20 no. 2M, 2010, data for years 2005–2006 data are compiled from Multiple Cause of Death File 2005–2006, series 20, no. 2L, 2009, and data for years 1999–2004 are compiled from the Multiple Cause of Death File 1999–2004, series 20, no. 2J, 2007. <http://wonder.cdc.gov/ucd-icd10.html>
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. 2011. Statistical methods used to calculate rates. <http://hospitalcompare.hhs.gov/staticpages/for-professionals/ooc/statistical-methods.aspx>.
- Chan, L., L. G. Hart, and D. C. Goodman. 2006. Geographic access to health care for rural Medicare beneficiaries. *Journal of Rural Health* 22, no. 2: 140–146.
- Chassin, M. R., J. M. Loeb, S. P. Schmaltz, et al. 2010. Accountability measures—Using measurement to promote quality improvement. *New England Journal of Medicine* 363, no. 7 (August 12): 683–688.
- Coburn, A. F., A. C. MacKinney, T. D. McBride, et al. 2009. *CMS value-based purchasing program and critical access hospitals*. Columbia, MO: Rural Policy Research Institute Health Panel.
- Cochran, G., K. Jones, L. Xu, et al. 2008. *Prevalence of evidence-based safe medication practices in small rural hospitals*. Rural issue brief no. 2008–1. Iowa City, IA: RUPRI Center for Rural Health Policy Analysis.
- Colwill, J. M., J. M. Cultice, and R. L. Kruse. 2008. Will generalist physician supply meet demands of an increasing and aging population? *Health Affairs* 27, no. 3 (May–June): w232–241.

- Cordes, S. M. 1989. The changing rural environment and the relationship between health services and rural development. *Health Services Research* 23, no. 6 (February): 757–784.
- de Groot, M., M. Kushnick, T. Doyle, et al. 2010. Depression among adults with diabetes: Prevalence, impact, and treatment options. *Diabetes Spectrum* 23, no. 1: 15–18.
- DeNavas-Walt, C., B. D. Proctor, and J. C. Smith. 2011. *Income, poverty, and health insurance coverage in the United States: 2010*. Current population reports: Consumer income. Washington, DC: Census Bureau.
- Doheny-Farina, S., P. W. Callas, M. A. Ricci, et al. 2003. *Technical communication and clinical health care: Improving rural emergency trauma care through synchronous videoconferencing*. Potsdam, NY: Clarkson University. <http://ntiaoint2.ntia.doc.gov/top/docs/eval/pdf/506099024e.pdf>.
- Duchesne, J. C., A. Kyle, J. Simmons, et al. 2008. Impact of telemedicine upon rural trauma care. *Journal of Trauma* 64, no. 1 (January): 92–97; discussion 97–98.
- Durairaj, L., J. C. Torner, E. A. Chrischilles, et al. 2005. Hospital volume-outcome relationships among medical admissions to ICUs. *Chest* 128, no. 3 (September): 1682–1689.
- Economic Research Service, Department of Agriculture. 2011. Rural income, poverty, and welfare: Poverty demographics. Poverty by race/ethnicity. ERS/USDA briefing room document. <http://www.ers.usda.gov/Briefing/incomepovertywelfare/povertydemographics.htm>.
- Everett, C. M., J. R. Schumacher, A. Wright, et al. 2009. Physician assistants and nurse practitioners as a usual source of care. *Journal of Rural Health* 25, no. 4 (Fall): 407–414.
- Flex Monitoring Team. 2011. *Critical access hospital year 6 Hospital Compare participation and quality measure results*. Flex Monitoring Team briefing paper no. 28. Minneapolis, MN: Flex Monitoring Team.
- Fonarow, G. C., W. T. Abraham, N. M. Albert, et al. 2007. Association between performance measures and clinical outcomes for patients hospitalized with heart failure. *Journal of the American Medical Association* 297, no. 1 (January 3): 61–70.
- Francis, M. L., S. L. Scaife, and W. E. Zahnd. 2011. Rural–Urban differences in surgical procedures for Medicare beneficiaries. *Archives of Surgery* (January 17).
- Francis, M. L., S. L. Scaife, W. E. Zahnd, et al. 2009. Joint replacement surgeries among medicare beneficiaries in rural compared with urban areas. *Arthritis & Rheumatism* 60, no. 12 (December): 3554–3562.
- Grigsby, B., A. G. Brega, R. E. Bennett, et al. 2007. The slow pace of interactive video telemedicine adoption: the perspective of telemedicine program administrators on physician participation. *Telemedicine Journal and E-health* 13, no. 6 (December): 645–656.
- Health Resources and Services Administration, Department of Health and Human Services. 2011. Medicare Beneficiary Quality Improvement Project. Presentation by Paul Moore, Office of Rural Health Policy. <http://www.ruralcenter.org/sites/default/files/MBQIP082011.pdf>.
- Hersh, W. R., D. H. Hickam, S. M. Severance, et al. 2006. *Telemedicine for the Medicare population: Update*. Evidence report/Technology assessment number 131. Report prepared for the Agency for Healthcare Research and Quality by the Oregon Evidence-based Practice Center. Rockville, MD: AHRQ.
- Hooker, R. S., and L. E. Berlin. 2002. Trends in the supply of physician assistants and nurse practitioners in the United States. *Health Affairs* 21, no. 5 (September–October): 174–181.
- Hooker, R. S., and D. J. Ciper. 2005. Physician assistant and nurse practitioner prescribing: 1997–2002. *Journal of Rural Health* 21, no. 4 (Fall): 355–360.
- Institute of Medicine. 1990. *Medicare: A strategy for quality assurance*, vol. I. Washington, DC: National Academies Press.
- Institute of Medicine. 2000. *Interpreting the volume–outcome relationship in the context of health care quality: Workshop summary*. Washington, DC: IOM.
- Institute of Medicine. 2004. *Quality through collaboration: The future of rural health care*. Washington, DC: National Academies Press.
- Institute of Medicine. 2010. *The future of nursing: Leading change, advancing health*. Washington, DC: National Academies Press.
- Jha, A. K., E. J. Orav, and A. M. Epstein. 2009. Public reporting of discharge planning and rates of readmissions. *New England Journal of Medicine* 361, no. 27 (Dec 31): 2637–2645.
- Johnston, B., L. Wheeler, J. Deuser, et al. 2000. Outcomes of the Kaiser Permanente Tele-Home Health Research Project. *Archives of Family Medicine* 9, no. 1 (January): 40–45.
- Jolliffe, D. 2002. Rural poverty at record low in 2000. *Rural America* 17, no. 4 (Winter): 74–77.
- Jolliffe, D. 2006. *The cost of living and the geographic distribution of poverty*. Economic research report number 26. Washington, DC: Economic Research Service, Department of Agriculture.

- Joynt, K. E., Y. Harris, E. J. Orav, et al. 2011a. Quality of care and patient outcomes in critical access rural hospitals. *Journal of the American Medical Association* 306, no. 1 (July 6, 2011): 45–52.
- Joynt, K. E., E. J. Orav, and A. K. Jha. 2011b. The association between hospital volume and processes, outcomes, and costs of care for congestive heart failure. *Annals of Internal Medicine* 154, no. 2 (January 18): 94–102.
- Kaiser Commission on Medicaid and the Uninsured. 2003. *Health insurance coverage in rural America*. Washington, DC: Kaiser Commission on Medicaid and the Uninsured. September.
- Kaiser Family Foundation. 2011. State health facts. <http://www.statehealthfacts.org/comparecat.jsp?cat=6&rgn=6&rgn=1>.
- Kaiser Family Foundation and Health Research and Educational Trust. 2008. *Employer health benefits annual survey*. Menlo Park, CA: KFF/HRET.
- Keeler, E. B., L. V. Rubenstein, K. L. Kahn, et al. 1992. Hospital characteristics and quality of care. *Journal of the American Medical Association* 268, no. 13 (October 7): 1709–1714.
- King, J., and G. Holmes. 2011. *Recent changes in health insurance coverage in rural and urban areas*. Findings brief. Chapel Hill, NC: North Carolina Rural Health Research & Policy Analysis Center.
- Klepser, D., L. Xu, F. Ullrich, et al. 2008. *Independently owned pharmacy closures in rural America*. Rural policy brief no. 2008–2. Iowa City, IA: RUPRI Center for Rural Health Policy Analysis.
- Klug, M. G., A. Knudson, and K. Muus. 2010. *Geographic differences in potentially preventable readmission rates in rural and urban hospitals*. Minneapolis, MN: Upper Midwest Rural Health Research Center.
- Latifi, R., R. S. Weinstein, J. M. Porter, et al. 2007. Telemedicine and telepresence for trauma and emergency care management. *Scandinavian Journal of Surgery* 96, no. 4: 281–289.
- Liu, J. J., G. Bellamy, B. Barnet, et al. 2008. Bypass of local primary care in rural counties: Effect of patient and community characteristics. *Annals of Family Medicine* 6, no. 2 (March–April): 124–130.
- Luo, J. S. 2008. Telemedicine: Is it time now? *Primary Psychiatry* 16, no. 2: 27–30.
- MacKinney, A. C., L. Xu, and K. J. Mueller. 2011. *Medicare beneficiary access to primary care physicians—Better in rural, but still worrisome*. Rural policy brief no. 2011–1. Iowa City, IA: RUPRI Center for Rural Health Policy Analysis.
- McBride, T., and L. Kemper. 2009. *Impact of the recession on rural America: Rising unemployment leading to more uninsured in 2009*. Rural policy brief no. 2009–6. Iowa City, IA: RUPRI Center for Rural Health Policy Analysis.
- McCarthy, D., R. Nuzum, Stephanie Mika, et al. 2008. *The North Dakota experience: Achieving high-performance health care through rural innovation and cooperation*. New York, NY: The Commonwealth Fund.
- Medicare Payment Advisory Commission. 2001. *Report to the Congress: Medicare in rural America*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2005. *Report to the Congress: Issues in a modernized Medicare program*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2006. *Report to the Congress: Increasing the value of Medicare*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2007. *Report to the Congress: Promoting greater efficiency in Medicare*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2010. *Report to the Congress: Aligning incentives in Medicare*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2011a. *Medicare copayments for critical access hospital outpatient services—2009 update*. Report prepared by staff from RTI International for the Medicare Payment Advisory Commission. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2011b. *Report to the Congress: Medicare payment policy*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2011c. *Report to the Congress: Regional variation in Medicare service use*. Washington, DC: MedPAC.
- Medicare Payment Advisory Commission. 2012. *Report to the Congress: Medicare payment policy*. Washington, DC: MedPAC.
- Missouri Hospital Association. 2011. *Primary care physicians: The status in rural Missouri*. MHA special report. Jefferson City, MO: MHA.
- Moscovice, I., and M. Casey. 2011. Rural-relevant quality measures for critical access hospitals. Presentation by staff from the University of Minnesota Rural Health Research Center at the Minnesota Rural Health Conference in Duluth, MN. June 27.

- Muelleman, R. L., A. F. Sullivan, J. A. Espinola, et al. 2010. Distribution of emergency departments according to annual visit volume and urban–rural status: Implications for access and staffing. *Academic Emergency Medicine* 17, no. 12 (December): 1390–1397.
- National Advisory Committee on Rural Health and Human Services. 2008. *The 2008 report to the Secretary: Rural health and human services .issues*. Washington, DC: NACRHHS. <ftp://ftp.hrsa.gov/ruralhealth/committee/nacreport2008.pdf>.
- National Center for Health Statistics, Centers for Disease Control and Prevention, Department of Health and Human Services. 2011. *Health, United States, 2010: With special feature on death and dying*. Hyattsville, MD: NCHS.
- Nicholas, S. S., D. M. Stamilio, J. M. Dicke, et al. 2009. Predicting adverse neonatal outcomes in fetuses with abdominal wall defects using prenatal risk factors. *American Journal of Obstetrics and Gynecology* 201, no. 4 (Oct): 383 e381–386.
- Office of Inspector General, Department of Health and Human Services. 2003. *Trends in rural hospital closure 1990–2000*. Washington, DC: OIG.
- Office of Inspector General, Department of Health and Human Services. 2005. *Status of the rural health clinic program*. OEI–05–03–00170. Washington, DC: OIG.
- Patton, L. 1989. Setting the rural health services research agenda: The congressional perspective. *Health Services Research* 23, no. 6 (February): 1005–1051.
- Peterson, C., Dean and Director of the North Dakota Telepharmacy Project, College of Pharmacy, Nursing, and Allied Sciences, North Dakota State University. 2011a. Interview with MedPAC staff, August 29.
- Peterson, C., Dean and Director of the North Dakota Telepharmacy Project, College of Pharmacy, Nursing, and Allied Sciences, North Dakota State University. 2011b. Personal communication with the author, August 29.
- Prospective Payment Assessment Commission. 1995. *Report and recommendations to the Congress*. Washington, DC: ProPAC.
- Radcliff, T. A., M. Brasure, I. S. Moscovice, et al. 2003. Understanding rural hospital bypass behavior. *Journal of Rural Health* 19, no. 3 (Summer): 252–259.
- Reschovsky, J. D., and A. Staiti. 2005. *Physician incomes in rural and urban America*. Issue brief no. 92. Washington, DC: Center for Studying Health System Change.
- Ricci, M. A., M. Caputo, J. Amour, et al. 2003. Telemedicine reduces discrepancies in rural trauma care. *Telemedicine and e-Health* 9, no. 1 (Spring): 3–11.
- Rogers, F. B., M. Ricci, M. Caputo, et al. 2001. The use of telemedicine for real-time video consultation between trauma center and community hospital in a rural setting improves early trauma care: Preliminary results. *Journal of Trauma* 51, no. 6 (December): 1037–1041.
- Rosenblatt, R. A., and L. G. Hart. 1993. Quality of care in rural hospitals. *Journal of the American Medical Association* 269, no. 7 (February 17): 865–866; author reply 866–867.
- Rubin, H. R., P. Pronovost, and G. B. Diette. 2001. The advantages and disadvantages of process-based measures of health care quality. *International Journal for Quality in Health Care* 13, no. 6 (December): 469–474.
- Ryan, A. M., J. F. Burgess, Jr., C. P. Tompkins, et al. 2009. The relationship between Medicare’s process of care quality measures and mortality. *Inquiry* 46, no. 3 (Fall): 274–290.
- Schur, C., and S. Franco, Department. 1999. Access to health care. In *Rural Health in the United States*, edited by T. C. Ricketts, and P. Heaphy. New York, NY: Oxford University Press.
- Shambaugh-Miller, M. D., N. Vanosdel, and K. J. Mueller. 2007. Reliance on independently owned pharmacies in rural America. *Rural Policy Brief*, no. PB2007–6 (November): 1–4.
- Silber, J. H., P. R. Rosenbaum, T. J. Brachet, et al. 2010. The Hospital Compare mortality model and the volume–outcome relationship. *Health Services Research* 45, no. 5, pt 1 (October): 1148–1167.
- Sorondo, B., R. J. G. Zamora, B., Holmberg, et al. 2011. Telemedicine consultation for emergency trauma: The 130 million square foot trauma room. *Bulletin of the American College of Surgeons* 96, no. 6: 12–19.
- South Carolina Rural Health Research Center. 2007. *Mode of travel and actual distance traveled for medical or dental care by rural and urban residents*. Key facts in rural health. Columbia, SC: South Carolina Rural Health Research Center.
- Street, D., J. Cossman, C. C. Butts, et al. 2009. *Physicians practicing in rural and underserved areas of Mississippi*. Jackson, MS: Mississippi Institute for Improvement of Geographic Minority Health.
- UnitedHealth Center for Health Reform & Modernization. 2011. *Modernizing rural health care: Coverage, quality and innovation*. Working paper 6. Minnetonka, MN: UnitedHealth Group.

Werner, C. A. 2011. *The older population: 2010*. 2010 Census briefs. Washington, DC: Census Bureau.

Werner, R. M., and E. T. Bradlow. 2006. Relationship between Medicare's hospital compare performance measures and mortality rates. *Journal of the American Medical Association* 296, no. 22 (December 13): 2694–2702.

Whitten, P., and L. Buis. 2006. *Private payer reimbursement for telemedicine services in the United States*. East Lansing, MI: Michigan State University.

WWAMI Rural Health Research Center. 2009. *The aging of the primary care physician workforce: Are rural locations vulnerable?* Policy brief. Seattle, WA: WWAMI RHRC.

Xu, L., F. Ullrich, and K. Mueller. 2009. *Loss of community pharmacies since 2006: State experiences*. Rural policy brief no. 2009–3. Omaha, NE: RUPRI Center for Rural Health Policy Analysis.

Ziller, E. C., A. F. Coburn, N. J. Anderson, et al. 2008. Uninsured rural families. *Journal of Rural Health* 24, no. 1 (Winter): 1–11.