



UnitedHealth®

Center for Health Reform & Modernization

Modernizing Rural Health Care:
Coverage, quality and innovation

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Preface

Why produce a paper on rural health care? First, because it's a topic that affects many millions of people. Indeed, if rural America were its own country, its population would be larger than nearly 90 percent of the world's nations. And second, because although rural communities face many of the same challenges as the rest of America, they also face some unique ones — particularly when it comes to health and health care.

This working paper sets out to examine the distinctive health needs of rural populations, and how well the health care system is currently able to respond. It presents new data on rural care quality; on the views of people living in rural areas; and what their physicians see as the major challenges to overcome.

Solutions to these challenges will need to embrace a wide spectrum of practical and complementary approaches, recognizing the heterogeneity of rural communities. For that reason, this working paper also draws on the 'real world' experience of innovative rural care systems and of UnitedHealth Group, in fields as varied as rural provider payment reform, rural telemedicine, the provision of mobile clinics, and support for the critical role played by nurses in rural communities.

In producing this paper, particular thanks go to Sandhya Agrawal, Catherine Anderson, Dawn Bazarko, Tom Beauregard, Michael Ceballos, Jeff Cho, Jeanne De Sa, Andrea Dilweg, Phil Ellis, Brett Fine, Pramod Gaur, Barb Gustafson, Sam Ho MD, Mike Ile, John Kaelin, Shirley Kang, Stewart Kiner, Jeri Kubicki, Aaron Larson, Randy Madson, Rhonda Medows MD, Brent Metfessel, Matt Onstott, Robert Ostrander, Tricia Purdy, Rick Ramsay, Jennifer Rogers, Lew Sandy MD, Jim Springrose MD, Kirk Stapleton, Reed Tuckson MD, Joel White and a number of other colleagues.

This is the sixth in a series of working papers from the UnitedHealth Center for Health Reform & Modernization. Our published work to date has examined cost containment in Medicare; the future of Medicaid; health care options for lowering the U.S. budget deficit; the use of technology to cut administrative waste from U.S. health care; and new approaches to preventing and managing diabetes. All are available at www.unitedhealthgroup.com/reform.

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Chairman, UnitedHealth Center for Health Reform & Modernization
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July 2011

Executive Summary

1. Fifty million Americans live in rural areas. Rural communities have many strengths and they face some common challenges: they are typically somewhat older, poorer, and more reliant on Medicare and Medicaid than other parts of the country. But there are also important regional differences. Three quarters of rural residents live in the South and Midwest, compared to only one-quarter in the Northeast and West. Whereas five million people live in isolated and remote locations, around 31 million people living in rural counties in fact live close to an urban area. And in recent times, opportunities in rural parts of the South and West have been attracting both younger populations and new retirees.

2. This working paper therefore sets out to answer five key questions about rural health and health care:

- What are the health challenges confronting rural Americans?
- How is the care delivery system currently organized to respond?
- What do we know about the quality of rural health care?
- What will the expected Medicaid and insurance coverage expansions from 2014 mean for rural areas?
- Are there practical solutions to these health, access, and quality challenges?

3. What are the health challenges confronting rural Americans? 19.5 percent of rural residents report being in only ‘fair’ or ‘poor’ health compared with 15.6 percent of urban residents. Chronic conditions such as cardiovascular disease and diabetes are a bigger problem for rural populations than in urban or suburban areas. This is particularly the case in the South, and amongst rural minority communities, for whom obesity rates and other risk factors are markedly elevated. These findings are confirmed by a new national UnitedHealth Group/Harris Interactive survey of rural and non-rural primary care physicians (n=1006) and consumers (n=2000) reported in this working paper. (see Chapter 1)

4. How is rural care delivery currently organized to respond to these needs? Primary care plays a central role, despite the fact that in remote rural areas there are fewer than half the number of primary care physicians per 100,000 population than in urban areas. Their work is significantly supplemented by an estimated 24,000 rural nurse practitioners and physicians’ assistants. Rural clinics, community health centers and small rural hospitals provide the backbone of facility-based rural health care — resulting in slightly more hospital beds per 100,000 residents in rural than urban areas. However, about a third of hospitalizations for rural patients occur at urban hospitals. And our survey of rural primary care physicians reveals that more than half of their patients have to travel more than 20 miles for specialty care (with the average reported as being about 60 miles), compared to only 6 percent of urban patients who do so. (Chapter 2)

What’s New in This Paper?

- New empirical research on rural versus urban quality of care
- New projections for rural Medicaid and insurance exchange 2014 coverage expansions
- New state-by-state and county-level analysis of future pressure on primary care capacity
- New models for rural care delivery and care coordination
- New national consumer and primary care physician survey data on:
 - key rural health and health care challenges
 - perceived quality of rural versus urban health care
 - primary care doctors’ willingness to treat new Medicaid patients
 - role of nurse practitioners in primary care
 - uptake — and barriers to use — of telemedicine
 - rural consumers’ access to prevention and wellness programs

5. What do we know about the quality of rural health care? The existing evidence is mixed, with some studies suggesting similar quality in rural and urban areas, and others suggesting rural areas may not do as well. This working paper presents new research suggesting that quality scores for urban and suburban areas are higher than those for rural areas in 75 percent of the hospital referral regions (HRRs) for which representative data are available. In a further 20 percent of HRRs there is no statistically significant difference in rural/non-rural measured performance, and in 5 percent of HRRs rural quality scores are higher. While suggestive rather than definitive, these data are consistent with the findings of the new national consumer and physician surveys also reported here. They show that both rural consumers and rural primary care physicians rate the quality of local care lower than do their urban and suburban counterparts. For example 49 percent of rural consumers rate the quality of local care as ‘very good’ or ‘excellent’, compared to 64 percent of non-rural consumers who do so. Twenty-four percent of rural consumers think their local care is only ‘fair’ or ‘poor’, compared to 12 percent of urban and suburban consumers who believe that. (Chapter 3)

6. What will be the impact on rural areas of the Medicaid and insurance exchange coverage expansions in 2014? This working paper provides new projections using a Lewin Group micro-simulation model to help answer that question. We find that by 2019 there could be an increase of around eight million rural residents in Medicaid and state insurance exchange plans, compared with what would have happened without the recent legislation. Since some of these people would have had other sources of insurance coverage, the net rural coverage expansion is projected at around five million people, although this is subject to significant uncertainty. These projections imply that rural areas could experience a proportionately higher increase in their non-elderly insured population than urban ones (16.1 percent versus 13.5 percent), with increases of over 20 percent in remote parts of the South and West. (Chapter 4)

7. How will rural providers respond to the coverage expansions? Our new national survey suggests that a higher proportion of rural primary care physicians may accept new Medicaid patients from 2014 than will their urban counterparts (59 percent of rural respondents versus 44 percent urban). That is consistent with the fact that rural doctors already receive a greater share of their income from public programs than do urban doctors: 56 percent of rural physician income was from Medicare and Medicaid compared with 45 percent for urban practices in 2006. (Chapter 4)

8. However without further modernization of care delivery, these coverage expansions will inevitably place pressure on rural health care provision. Five million rural residents already live in designated ‘shortage areas’, defined by the federal government as counties with fewer than 33 primary care physicians per 100,000 residents. And under a quarter of rural primary care doctor survey respondents think there will not be a shortage of primary care providers from 2014, whereas over one-third of urban primary care doctors take that view. This working paper therefore maps the new rural coverage expansions against areas with relatively low primary care capacity to identify locations where the pressures will be greatest. We find that these areas tend to be in the South, and often have some of the tightest scope-of-practice restrictions on nurse practitioners and other non-physician health professionals. (Chapter 4)

9. What are some practical solutions to these rural health and health care challenges? This paper identifies a range of options for modernizing rural care delivery, drawing on successful examples of innovation in particular parts of the country, in the private sector and in public programs.

10. In addition to the numerous programs already in place, **primary care medical homes** represent one new reimbursement model that has the potential to improve rural primary care physician recruitment and retention, by providing opportunities for gain sharing from improved preventive care and ongoing care coordination. It also makes sense to strengthen **multidisciplinary teamwork in rural primary care**, freeing nurse practitioners, physicians' assistants and others to practice using the full range of their skills, rather than being subject to outdated scope-of-practice licensing constraints. Our new national survey finds that a majority of rural primary care doctors agree with this approach. There are also significant opportunities for greater **provider collaboration across rural areas and with urban health care systems** as has been pioneered in states such as Minnesota and New Hampshire. Innovative models using **mobile health clinics** are being developed in states such as Mississippi. Chronic care management is likely to improve with faster rural uptake of **electronic health records** and related clinical IT. And **rural consumers' engagement in improving their own health** could be stimulated by wider adoption of some of the innovative new 'value-based' benefits and care management programs being developed for diabetes and other conditions. (Chapter 5)

11. Telemedicine and telehealth have the potential to transform aspects of rural health care, improving accessibility, quality and affordability. This working paper discusses the current technological frontiers and likely advances, together with new survey data on current usage of telemedicine by rural and urban doctors, and what they perceive as barriers that need to be overcome. To make full use of telemedicine's potential a number of practical changes are now required. These include: building on work by the Federal Communications Commission and others to expand rural broadband capacity (estimated at around 60 percent of rural areas versus 70 percent of urban areas); introducing new public and private payment models for telemedicine, perhaps linked to the move away from traditional fee-for-service reimbursement models; and continued action by the Food and Drug Administration and others to remove outdated regulatory barriers to adoption. (Chapter 6)

12. As new rural populations are offered Medicaid or coverage through new insurance exchanges, states will confront the question of **how to ensure there are enough high quality health plan choices and rural provider networks** to serve those individuals. The working paper discusses a range of approaches states and the federal government can take to secure these objectives for rural Medicaid, exchange-based plans and also Medicare. These include: recognizing the role that nurses and other suitably qualified health professionals can play in meeting network adequacy standards, alongside mobile and telemedicine-enabled providers where appropriate; taking care in designing insurance market and exchange rules explicitly to recognize the distinctive population and provider characteristics of more rural parts of each state; using the state's purchasing power to incentivize participation by rural providers, as states such as Georgia have done; driving greater transparency on quality; and ensuring new federal initiatives on Medicare reform are tailored for rural communities. (Chapter 7)

13. The next few years will be times of considerable stress on rural health care, but also times of great opportunity. Across the country there are already impressive examples of innovative new care models providing high quality care, tailored to the distinctive needs of their local community. The challenge for all involved in rural America now is to build on that track record of innovation and self-reliance, so as to ensure that all Americans — wherever they live — can live their lives to the healthiest and fullest extent possible. (Chapter 8)

Part A – Current Challenges

Chapter 1: Health in Rural America

Addressing the challenges of health care delivery in rural America first requires a clear understanding of the characteristics of rural communities, the people living in them, and their health issues. While health issues in rural communities are to an extent a reflection of nationwide problems, there are notable differences between urban and rural communities.

About 16 percent of the U.S. population lives in rural communities. Rural America’s geography, population and economy are diverse and varied. Arable farmland, railroads, mountainous terrain and the growth of urban centers on the coasts contribute to notable regional differences among rural areas.

Rural-Urban Classification by County, 2008

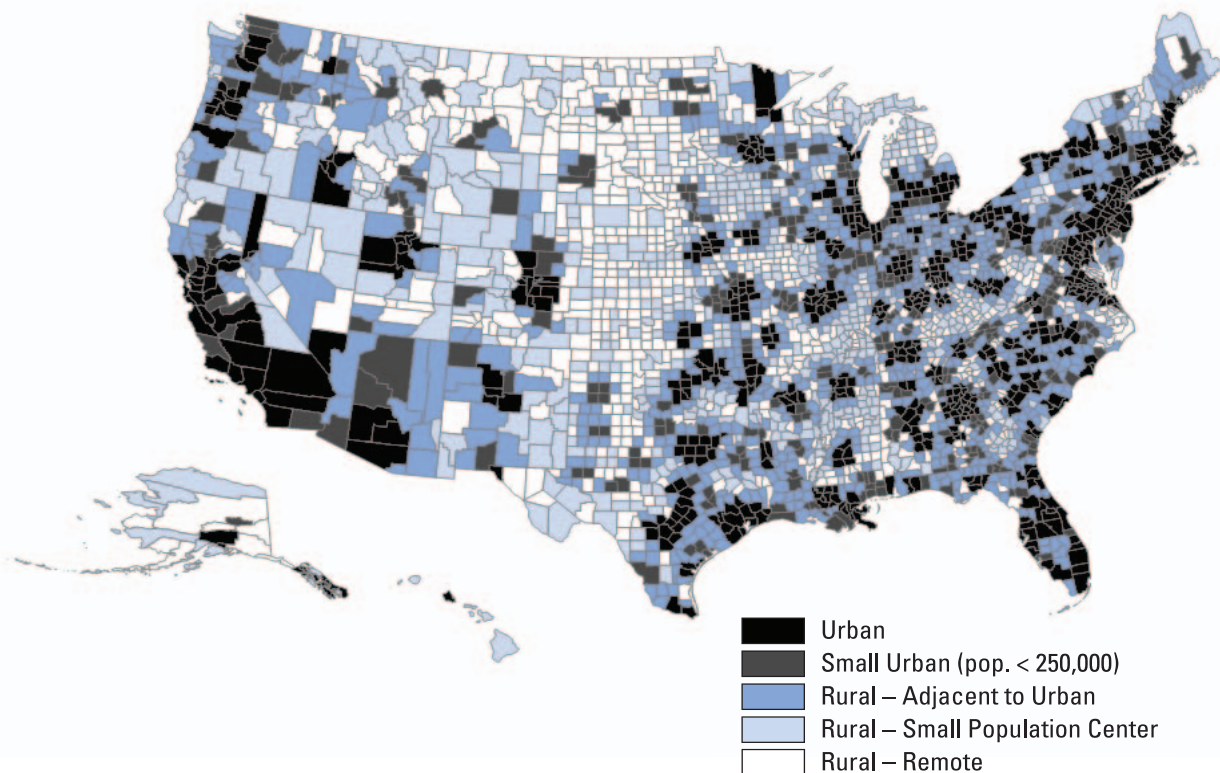


Figure 1.1; Source: UnitedHealth Group Analysis of USDA Rural Urban Continuum Codes. Some urban counties cover large land areas and have residents living in areas that could be defined as ‘rural.’ About 20 percent of the population is rural under a broader definition.

Most ‘rural’ residents in fact live in counties bordering metropolitan areas, and only a small proportion live in very remote communities. As shown in Figure 1.1, we identified three distinct types of rural areas using county-level designations from the U.S. Department of Agriculture.¹ The three types of areas are:

- a. **Areas adjacent to urban areas.** Over 60 percent of rural residents live in counties adjacent to urban areas, especially in the Northeast (over 77 percent) and the South (about two-thirds).

- b. Regional population centers not bordering larger urban areas.** Another 28 percent of rural residents live in counties that contain regional population centers that do not directly border larger urban areas.
- c. Geographically remote areas.** The remaining 10 percent of the rural population lives in geographically remote counties that tend to have small populations dispersed over a large area.

Rural Population, by Census Region and Type of Rural County (Millions), 2009					
	Midwest	Northeast	South	West	Total
Total U.S.	66.8	55.3	113.3	71.6	307.0
Urban	51.4	50.0	91.0	64.3	256.8
Rural	15.4	5.3	22.3	7.2	50.2
% Rural	23.1%	9.6%	19.7%	10.1%	16.4%
Type of Rural County					
Adjacent to Urban	8.3	4.1	14.7	3.7	30.8
Small Population Center	5.1	1.0	5.2	3.1	14.3
Remote	2.0	0.2	2.5	0.5	5.1
Median Population Density for Counties in Category (People Per Square Mile)					
Urban	152	431	149	104	170
Adjacent to Urban	47	74	51	15	48
Small Population Center	29	48	37	5	27
Remote	7	16	23	2	8

Table 1.1; Source: UnitedHealth Group Analysis of the HRSA Area Resource File and U.S. Census data. Figures may not sum to totals due to rounding.

The Midwest has the largest *percentage* of rural residents, followed closely by the South, which has the largest *number* of rural residents. (See Table 1.1) Most rural areas in the Northeast have a higher population density than the rural areas in other regions; the exceptions are remote areas in the South, which are more densely populated than similar areas in the rest of the country.

Within these rural areas, residents tend to be older and poorer than their city- and suburban-dwelling counterparts. More than 15 percent of people living in rural areas are over age 65 compared to about 13 percent of the U.S. population as a whole. In remote areas, more than 18 percent of residents are over age 65. Populations in the West tend to be younger overall while higher proportions of elderly live in the Midwest and Northeast.²

In economic terms, rural areas have a disproportionate share of families with earnings below the federal poverty level, compared to metropolitan areas (although rural areas also have a lower cost of living). Rural areas have fewer opportunities for high-skilled workers than urban areas. About 42 percent of the non-metropolitan workforce is employed in low-skilled jobs, compared with 34 percent of workers in metropolitan areas. In 2009, about 17 percent of individuals living outside metropolitan statistical areas (MSAs) were poor, compared to 14 percent of residents living in MSAs.³ This disparity is even greater among minority rural populations: in 2009, 32 percent of non-metropolitan African-Americans and 28 percent of non-metropolitan Hispanics were poor, compared to 13 percent of non-metropolitan whites.⁴ Many Native American tribal members also reside in rural areas and experience disproportionate levels of poverty.

Given this challenging economic environment, population loss has been a common trend in rural areas. In the two decades prior to 2008, more than one-third of non-metropolitan counties lost roughly 10 percent of their population as people moved to metropolitan areas.⁵ This trend coincided with a population movement from inner cities to suburban and exurban parts of metropolitan areas. Over the past decade, the population of metropolitan areas has grown at higher rates than rural areas and small towns, in part due to declines in the numbers of people in industries such as farming, fishing, mining, and ranching.

Today, however, the exodus from rural counties appears to be ebbing. Economic growth and opportunities in rural and micropolitan areas (areas with populations of 10,000 – 50,000) in the South and West, combined with affordable housing and lifestyle appeal, have been drawing younger populations and retirees. Rural areas have become more densely populated as a result, with growth focused on small population hubs. Some rural communities also have seasonal surges in population, due to an influx of agricultural migrant workers or vacationers. The presence of military bases in rural areas also affects the number of active personnel and family members requiring health care, and fluctuates with deployment and transfers.

Over the next 20 years the U.S. population is expected to grow 18 percent. The most active areas of growth are predicted to be in the western Mountain states (38 percent), states along the southeastern coast, including Florida (31 percent), and in the South Central region, which includes Texas (28 percent) — all areas with significant rural populations. Although much of the projected growth is likely to be in the metropolitan areas in those parts of the county, rapid population growth nonetheless has implications for surrounding rural areas and raises questions for how existing health infrastructure in those areas will need to evolve to handle demands in the future.⁶

Health Status

Chronic health conditions affect the health of all Americans, and certain health behaviors contribute to those and other problems. Rural areas are no exception. However, greater prevalence of certain conditions and risk factors contribute to greater health challenges in rural communities.

To better understand the health issues facing rural communities, we asked physicians and consumers about their views on the most pressing health challenges in their communities and found that chronic conditions were major concerns for both groups. Primary care physicians in both urban and rural areas identify diabetes, cardiovascular disease and cancer as major challenges, as shown in Figure 1.2. Rural physicians were significantly more likely than urban ones to view diabetes as a major challenge, especially in the rural South. Additionally, drug abuse and teen pregnancy were significantly higher concerns of primary care physicians in rural areas.

Primary Care Physicians Say Chronic Conditions Are the Biggest Local Health Challenges

“What would you say are the major health problems affecting your community today?”

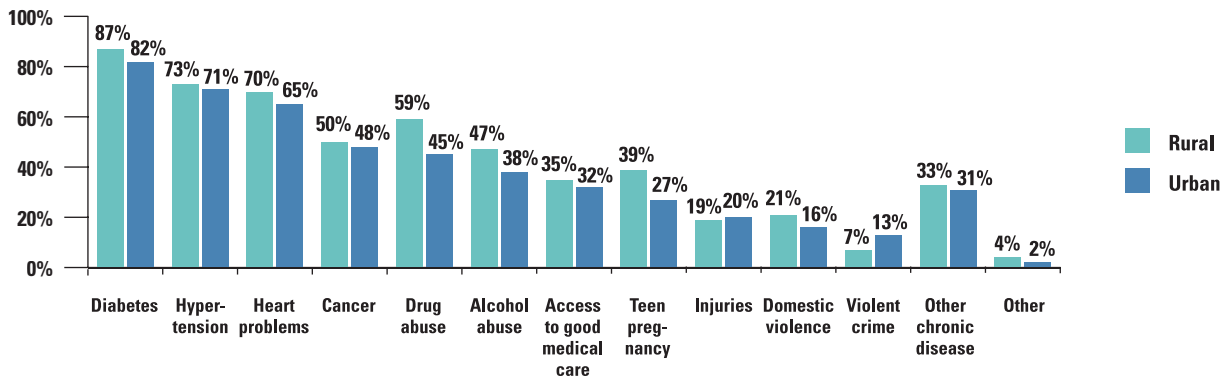


Figure 1.2; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

Some key regional differences for perceived major health problems include:

- Hypertension in the South (76%), in particular the rural South (84%)
- Teen pregnancy in the South (38%)
- Diabetes in the rural South (93%)
- Alcohol abuse in the rural West (68%)

Consumers largely concur with this assessment, as shown in Figure 1.3 below, with rural and urban consumers having similar views on the range of problems in their community.

Consumers Identify Drug Abuse, Cancer and Diabetes as Major Local Health Problems

“What would you say are the major health problems affecting your community today?”

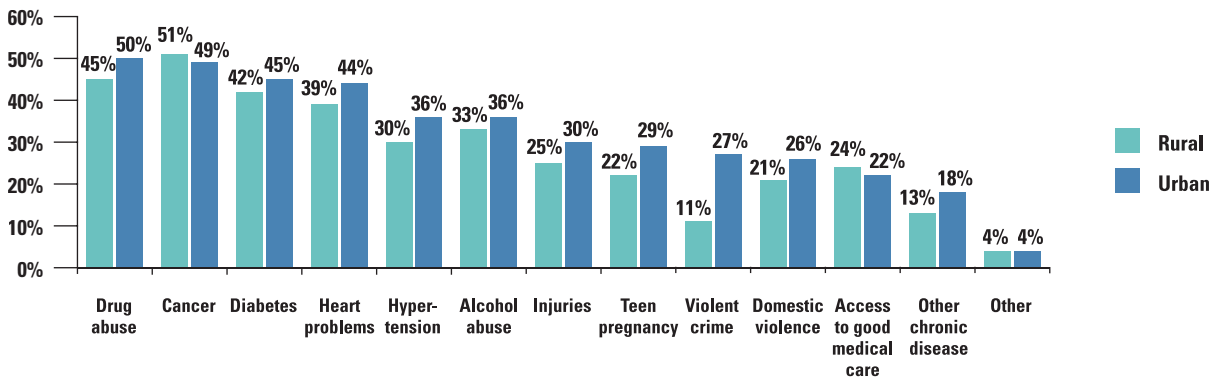


Figure 1.3; Source: UnitedHealth Group/Harris Interactive Consumer Survey, May 2011

The survey of consumers further indicated that rural residents are more greatly affected by chronic diseases, with more individuals living in households with heart conditions or diabetes. This is consistent with research findings that overall residents in rural counties are more likely to report only ‘fair’ or ‘poor’ health compared to residents of urban counties (19.5 percent versus 15.6 percent).⁷ For Medicare beneficiaries the findings are mixed.⁸ One possible explanation: as health declines for rural seniors, they move closer to family and medical care in urban areas.

A closer look at existing data sources shows that chronic conditions are clearly a greater problem in rural than urban areas. Rural adults are more likely than urban ones to have a range of chronic conditions, as illustrated in Table 1.2 below. Among rural minorities, the prevalence of certain chronic conditions is even greater. The rate of diabetes among rural American Indian/Alaska Native adults and rural African-American adults was 15.2 percent and 15.1 percent, respectively.⁹

Age-Adjusted Percentage of People with Certain Conditions, by Metropolitan and Non-Metropolitan Area		
	Large MSA	Outside of MSA
Hypertension	22.4	27.3
Diabetes	8.2	8.9
Cancer – Any type	7.2	9.5
Arthritis	19.8	25.8
Chronic Bronchitis	3.7	5.1

Table 1.2; Source: Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2009, U.S. Centers for Disease Control and Prevention

The rural South bears a disproportionate burden of chronic conditions. Today, this area is known for its so-called ‘stroke belt’ due to high rates of age-adjusted hypertension and stroke mortality and its ‘heart failure belt’ due to high age-adjusted rates of heart failure mortality.¹⁰ Rural residents located in the rural South also suffer from higher rates of diabetes than in rural areas in other parts of the country, with 20 percent more rural southerners affected (as compared to all rural individuals). Diabetes also disproportionately affects people living in American Indian tribal areas. See Figure 1.4 for county-level distribution of diabetes prevalence, adjusted for age.

County-Level Comparison of Diagnosed Diabetes Rates Among Adults Aged 20+, 2008.

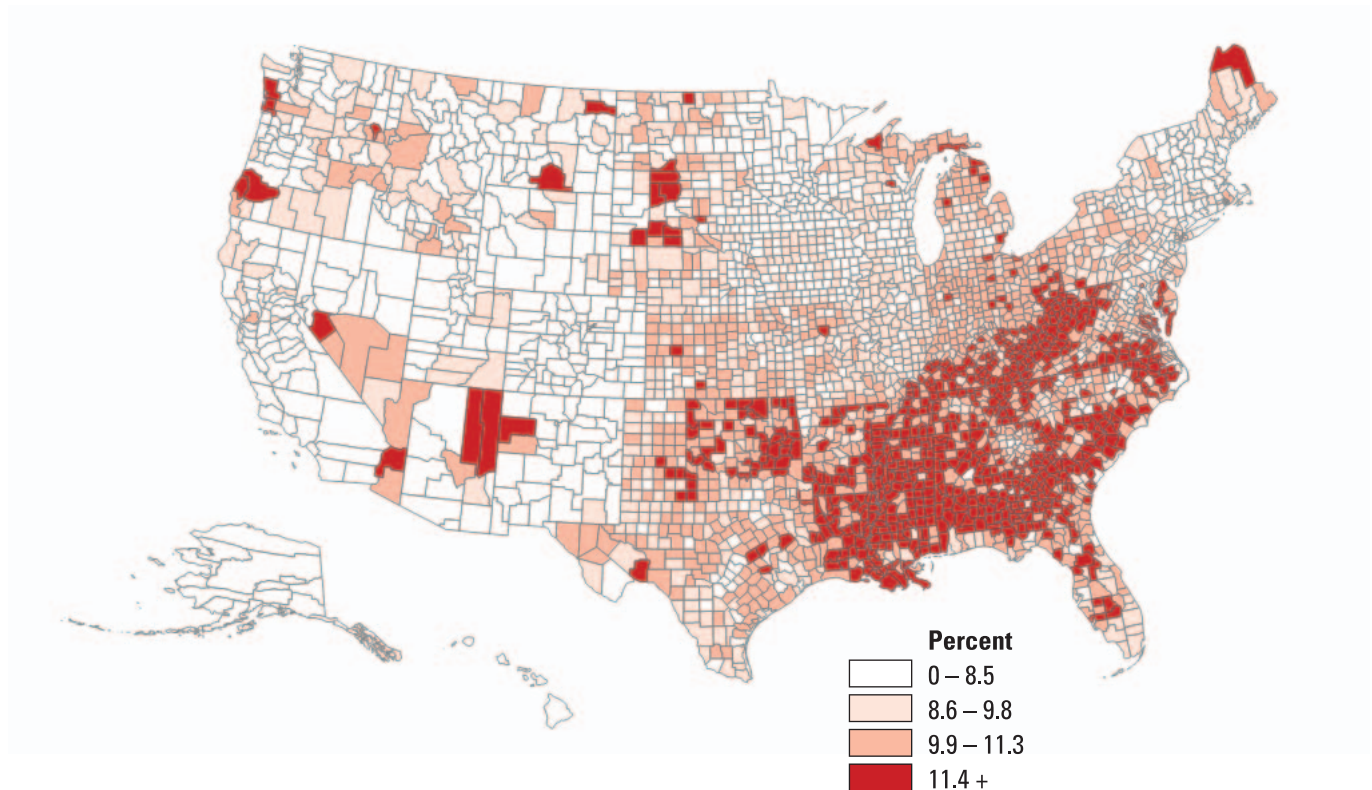


Figure 1.4; Source, UnitedHealth Group, *Analysis of County Health Rankings*

Health-related behaviors are part of the explanation for these population health issues and their related regional prevalence. Obesity, for example, is a greater issue for rural residents than for urban. Obesity rates among rural black adults ranged from 38.9 percent in rural small metropolitan counties to 40.7 percent in remote rural counties (compared to about 34 percent for the nation).¹¹ Among children, approximately 16.5 percent in rural areas are obese, compared to 14.4 percent in urban areas.¹² Relative to the distribution of the U.S. population, rural people reporting obesity, smoking and physical inactivity are consistently overrepresented in the South. (See Table 1.3)

Prevalence of Select Health Issues by Region					
	Midwest	Northeast	South	West	Total
Obesity					
Total U.S.	28.6%	25.0%	28.1%	23.4%	26.6%
Urban	28.4%	24.7%	27.4%	23.1%	26.0%
Rural	29.3%	27.4%	31.0%	25.2%	29.2%
Smoking					
Total U.S.	20.3%	18.8%	19.9%	16.0%	18.9%
Urban	20.8%	18.5%	19.6%	15.7%	18.6%
Rural	18.8%	22.0%	21.0%	19.3%	20.2%
Physical Inactivity					
Total U.S.	24.3%	24.4%	26.1%	19.0%	23.8%
Urban	23.8%	24.4%	25.0%	18.7%	23.1%
Rural	26.1%	24.7%	30.7%	21.4%	27.3%

Table 1.3; Source: UnitedHealth Group Analysis of County Health Rankings

Dental and mental health issues are also issues for rural populations. Rural residents, for example, report poorer oral health (i.e., higher rates of permanent tooth loss) than people in urban areas. The prevalence of mental illness in rural areas is equal to or greater than in urban populations, with rural residents reporting greater rates of depression than those in metropolitan areas.¹³ Across all four regions of the country, suicide rates are higher among men in rural areas than among men in urban areas. Untreated depression is a chronic issue. Rural access difficulties result in many rural residents forgoing treatment altogether or obtaining care from non-specialists for mental health problems. More than 40 percent of recent war veterans are expected to return to their homes in rural areas. Many will likely be coping with post-traumatic stress disorder (PTSD) and traumatic brain injury.¹⁴

Consistent with findings in the consumer survey, alcohol and substance abuse are a significant problem in rural areas. Of young adults ages 12 to 17, 9.8 percent in non-metropolitan areas engage in binge drinking, compared to 9.0 percent in small metropolitan areas and 8.4 percent in large metropolitan areas.¹⁵ A more serious form of substance abuse in rural areas is use of methamphetamines (or ‘meth’). The rural setting provides easy access to the ingredients used in making meth and remote areas where labs can be hidden. In the rural South, meth lab incidents nearly tripled between 2007 and 2009.¹⁶ The health consequences of exposure to meth are severe and numerous, including stroke, mental health issues, serious dental problems and prenatal complications.¹⁷

Health Insurance Coverage for the Rural Population

A higher proportion of rural residents are covered by Medicare and/or Medicaid than urban residents. In rural areas, 31 percent of the population has either Medicare or Medicaid as their primary source of coverage; in urban areas, that figure falls to 25 percent. The rural-urban difference is greatest in the South and West with those areas having even higher rates of public coverage.¹⁸

Most rural Medicare beneficiaries are enrolled in Medicare fee-for-service with many relying on Medigap supplemental coverage to help cover additional costs. In 2008, 31 percent of Medigap policy holders lived in rural areas.¹⁹ Medicare Advantage enrollment is higher in urban counties (25 percent) than in rural counties (13 percent).²⁰ Medicare beneficiaries in rural areas need access to a range of providers for routine primary care services as well as care for their chronic conditions and specialized hospital care. Although the same is true for urban seniors, rural Medicare beneficiaries often have adult children living far away, making the need for care-giving services, particularly for transitions home following a hospital stay, often greater.

Rural residents participate in Medicaid and the Children's Health Insurance Program (CHIP) at a higher rate than urban residents. In many states, rural Medicaid enrollees are in primary care case management (PCCM) programs, which rely on fee-for-service payments and case management fees. However, some states rely instead on fully capitated managed care programs to provide care for their rural Medicaid populations.²¹ There are differences between rural areas based on the current variations in state Medicaid eligibility, often producing higher Medicaid eligibility thresholds in Midwestern and Northeastern states compared to states in the South and the West. State Medicaid programs must link enrollees with a wide range of health care needs to appropriate services, including specialty care for chronic conditions and treatment of behavioral health problems.

Although there is variability in insurance coverage across the U.S., rural Americans are slightly more likely to be uninsured than individuals in metropolitan areas. Twenty percent of rural residents under age 65 are uninsured, compared to 18 percent in urban areas. In some remote rural areas, the number of non-elderly uninsured is 27 percent.²² This population may not be able to routinely access primary care services, as well as emergency services.

Rural residents are less likely to have access to coverage through an employer than their urban peers. Private insurance coverage rates are 46 percent for rural areas compared to 52 percent for urban ones.²³ This is due in part to the type of employment available in rural areas and a lower number of firms offering coverage. Many workers are employed by small businesses, are self-employed, work part-time or are seasonal workers. As a result, individual coverage is more prevalent in rural areas.²⁴

Chapter 2: The Rural Health Care Delivery System

An optimal health care delivery system marries public health, primary care, chronic care management, pharmacy and non-medical supports with trauma care and specialized medical services provided by a mix of local and regional facilities. Given the health care needs of rural populations discussed in Chapter 1, any modern rural health delivery system must have a robust primary care infrastructure in place to provide preventive care and manage chronic conditions for a dispersed population, often covered by Medicare and Medicaid. There also is a need for seamless access to specialty care and long-term care services for rural residents, particularly for seniors. In this chapter, we examine the needs and capabilities of the rural care continuum.

Primary Care in Rural Areas

Local public health. Historically, local health departments, often run by counties, have played a central role in providing public health services in many rural communities. Environmental health, child health, and communicable disease control are the main functions of rural public health departments.²⁵ They also maintain vital statistics records, provide immunizations and screenings, monitor disease breakouts, and communicate with the public about health issues. They often have lab facilities and some may conduct screenings or run health education programs. However, because they are dependent on public funding, the level of services provided by local health departments varies greatly across the country. In most cases, local public health departments are not in a position to provide primary care or wellness services across large populations in dispersed areas.²⁶

Primary care providers. Primary care providers (including nurse practitioners and physician assistants) play a central role in the rural delivery system. They comprise about two-thirds of all practitioners in rural areas (see Table 2.2). However, of the 300,000 primary care physicians nationwide, only about 33,000, or 11 percent, practice in rural areas, a share that is lower than the 16 percent of the national population living in rural areas. The number of practicing physicians per person in rural areas is much lower than that in urban areas. In urban areas, the ratio of primary care physicians to 100,000 people is 105 on average, while in rural areas that rate is about 65 per 100,000.²⁷ (See Table 2.1) Physicians that do practice in rural areas tend to be located in counties near urban areas or concentrated in small rural population centers. Rural counties in remote areas generally have the lowest proportion of physicians per 100,000, particularly in the South and Midwest. (See Appendix 5 for a county-level map of primary care physician capacity.)

Primary Care Physicians Per 100,000, by Region and Type of County, 2008					
	Midwest	Northeast	South	West	Total
Total U.S.	99.4	125.0	87.2	93.3	98.1
Urban	109.4	129.6	94.4	95.5	104.5
Rural	66.0	81.5	57.7	73.5	65.0
Type of Rural					
Adjacent	63.1	75.8	56.8	66.6	62.2
Small Population Center	78.7	106.3	69.1	83.7	78.2
Remote	45.0	81.0	39.0	61.5	45.2

Table 2.1; Source: UnitedHealth Group, Analysis of the HRSA Area Resource File

The dominant model of physician delivery in rural areas has long been the solo or small practice. These practices treat a larger proportion of Medicare and Medicaid patients than those in urban areas due to the underlying patient demographics. In 2006, 56 percent of rural physician revenue was derived from Medicare and Medicaid, compared to 45 percent for urban practices.²⁸ In recent years physicians have begun to organize into group practices typically consisting of fewer than five physicians supplemented by nurse practitioners, physician assistants and other non-physician professionals. Practices are also increasingly affiliated with informal or formal physician networks based at Critical Access Hospitals (CAHs, described further below), larger rural referral hospitals, or urban facilities.²⁹ Additionally, metropolitan and large rural hospitals are looking to purchase rural physician practices.

Nurse practitioners and physician assistants (referred to throughout this paper as non-physician providers) play an important role in primary care delivery in rural settings, particularly in remote rural areas. Based on data from HRSA's Area Resource File, about 12 percent, or 24,000, of the 130,000 nurse practitioners and 70,000 physician assistants practice in rural areas; in the Midwest that percentage is higher. Those figures may underestimate the total number of nurse practitioners. The Kaiser Family Foundation reports there are 30 percent more of those providers. Clinics and health centers in rural areas (described below) rely on these providers for much of the primary care delivered in rural settings.³⁰

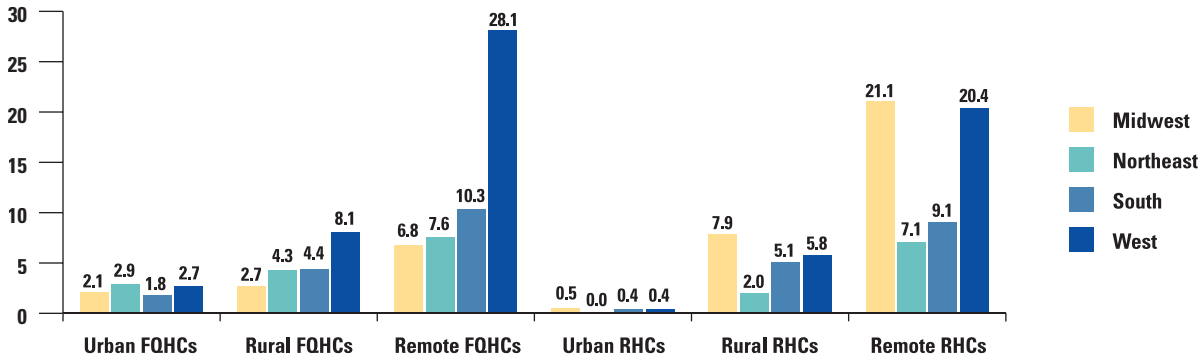
In part due to the numbers of non-physician providers and health clinics in rural areas (discussed below), rural residents report about the same number of medical care visits as their urban counterparts. Research shows that the ratio of rural visits stands at about 93 percent of urban visits. Non-elderly rural residents using health services had one fewer ambulatory visit per year, on average, compared to urban residents.³¹ Rural Medicare beneficiaries show a similar use pattern.³²

Rural clinics and health centers. More than urban areas, rural communities depend on a system of small clinics and health centers to provide primary care services, often utilizing non-physician health professionals. This system consists of rural health clinics (RHCs), Federally Qualified Health Centers (FQHCs) — most of which are community health centers (CHCs) — and Indian Health Service (IHS) clinics. Figure 2.1 shows the importance of those facilities in rural areas, especially in the Midwest and West.

About 3,800 RHCs operate in rural communities.³³ Most are located in the South and Midwest.³⁴ With most patients on public programs, roughly 55 percent of RHC revenue is derived from Medicare and Medicaid. The remaining balance can be attributed to commercial health plans and discounted fees for care provided to low-income, uninsured residents.³⁵ About half of RHCs are freestanding practices; the other half operates within larger hospitals or health care systems. Today, although RHCs do not receive direct grants from the federal government, they are currently eligible for cost-based reimbursement under Medicare.

Although they are most common in urban areas, about 2,200, or one-third, of FQHC service sites are in rural communities. Moreover, about 44 percent of their patients are rural. FQHC/CHCs often provide a broader range of services than RHCs, including oral health, mental health and substance abuse services.³⁶ As is the case with RHCs, CHCs rely on public programs for a significant portion of their revenue. One-third of CHC revenue is Medicaid-related and 6 percent is Medicare-related. Although FQHCs have historically been eligible for cost-based reimbursement under Medicare, Medicare payment will shift to a prospective payment system (similar to that operated in the Medicaid program) by 2015. Most FQHCs also receive direct federal funding to pay for the services they provide and about 25 percent of their reimbursements are directly tied to federal grants (so-called 'section 330 grants').³⁷

FQHCs and RHCs Per 100,000 by Urban, Rural and Remote Rural Distribution and Region, 2008



Note: FQHC figures represent service sites and include health centers that have federal ‘look-alike’ status. A small number of RHCs are located in low-density areas of metropolitan counties.

Figure 2.1; Source: UnitedHealth Group Analysis of the HRSA Area Resource File and Geospatial Data Warehouse

Recent legislation expands health center funding by \$11 billion over five years. Most of these funds are dedicated to increasing the capacity of health centers and their medical, dental, and behavioral health services. One and a half billion dollars is allocated to capital expansion.³⁸ This new funding builds upon the \$2 billion provided for health clinics in the American Recovery and Reinvestment Act (ARRA).³⁹ These additional resources double federal program funding for CHCs, which currently receive about \$2 billion a year. Though only one-third of CHCs are currently located in rural areas, these centers have the potential to provide primary care services to nearly 60 percent of the rural population.⁴⁰

IHS facilities provide critical health care options for rural American Indians and Alaska Natives. IHS clinics provide care on remote Indian reservations and off-reservation, in communities where services would otherwise be unavailable.⁴¹ Of the 340 IHS clinics in operation today, about 60 percent are located in rural communities with over half located in the West. Migrant health centers provide services to seasonal agricultural workers and their families.

An emerging source of primary care is the retail or corporate clinic known as ‘convenient care clinics.’ Though this model is fairly new, today more than 1,200 retail clinics operate in 37 states.⁴² Only about 12 percent of retail clinics, however, operate in rural areas.⁴³ These clinics, typically staffed by nurse practitioners, are often located in retail chains such as Target, Wal-Mart, Kroger and Walgreens.⁴⁴

Pharmacy services. Access to prescription medication can be a challenge for rural Americans. In many rural communities, there is a single pharmacy that is independently owned and is often the sole pharmacy for miles: in about 1,000 rural communities the distance between pharmacies is greater than 10 miles.⁴⁵ Mail order pharmacies, however, are available to provide drug-related advice and information to rural residents in addition to delivering prescriptions.

Specialty Professional Care

Specialty care is not widely available in rural areas and is concentrated in urban areas. Specialists represent 44 percent of providers in urban areas and 31 percent of rural providers (see Figure 2.2). Put another way, roughly 11 percent of general and family medicine physicians and only about 8 percent of surgeons practice in rural areas.⁴⁶

Distribution of Health Professionals in Urban and Rural Areas, 2008

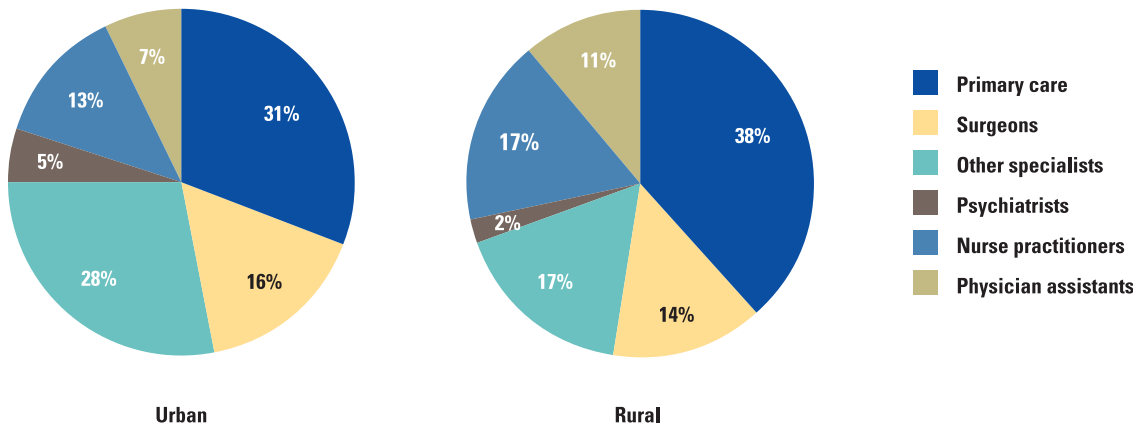


Figure 2.2; Source: UnitedHealth Group Analysis of the HRSA Area Resource File

As Table 2.2 shows, rural communities have less than half the number of surgeons and other specialists per capita compared to urban areas. Consequently, as rural residents seek medical services they often drive long distances to urban centers for specialist care such as cardiology or neurology and for surgical procedures.

Physicians Per 100,000 by Type and Practice Location, 2008			
	Urban	Rural	Rural/Urban
All Physicians	270	122.2	45%
Primary Care Physicians	104.5	65	62%
OB/GYNs	12.9	5.8	45%
Pediatricians	19.4	6.7	34%
Surgeons	55.1	24.5	44%
Other Specialists	94.8	28.5	30%
Psychiatrists	15.6	4.2	27%
Dentists	68.9	36.2	53%

Table 2.2; Source: UnitedHealth Group, Analysis of HRSA Area Resource File

Underscoring these data, rural primary care physicians report that slightly more than half of the patients they refer for specialty care are required to travel over twenty miles, as shown in Figure 2.3. This compares to only 6 percent of urban consumers. Rural consumers report an average distance of about 60 miles between their local primary care physician’s office and a specialist’s office (compared to about half as much on average for urban consumers).

Most Rural Patients Are Referred Over Twenty Miles Away for Specialty Services

“Where do you typically refer patients for specialty services?”

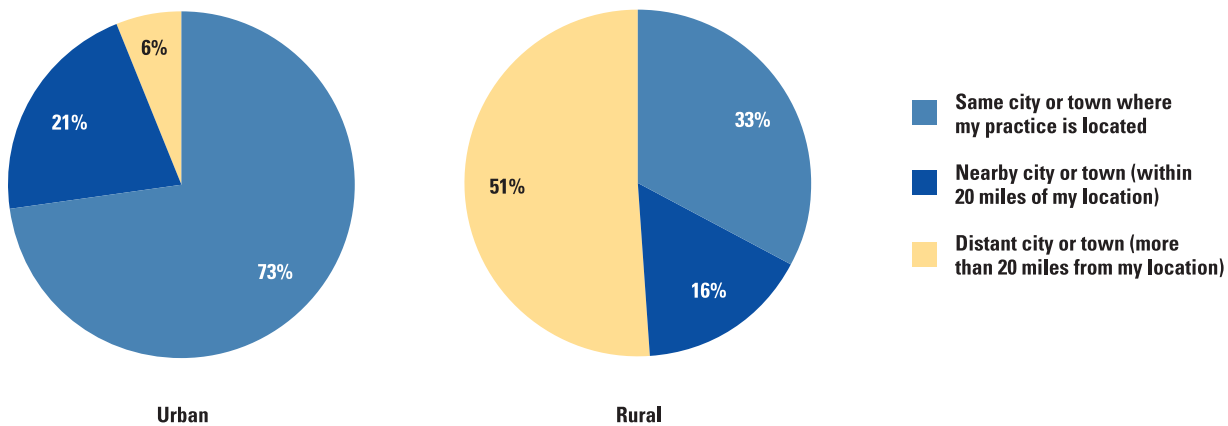


Figure 2.3; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

Unsurprisingly, more rural than urban primary care physicians report that their patients have difficulty accessing specialty care in their local physician’s area, as shown in Figure 2.4.

Rural Primary Care Physicians Report That Their Patients Have Greater Difficulties Accessing Local Specialty Care

“How difficult is it for your patients to obtain specialty services in your area?”

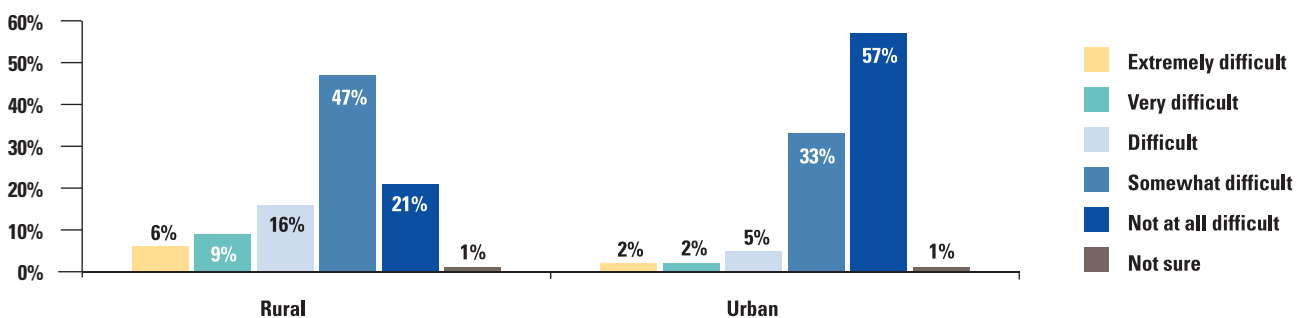


Figure 2.4; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

However, pockets of specialist services and expertise may be available in rural population hubs where teaching hospitals or large hospital systems are present, such as Dartmouth-Hitchcock in rural New Hampshire. Moreover, rural primary care doctors are more likely than urban primary care doctors to perform specialist procedures such as colon-endoscopies.⁴⁷

Rural areas are facing a limited supply of pharmacists, dentists and mental health professionals. Because training programs have not kept pace with the rapid and growing demand for pharmacists, there are relatively few pharmacists available to serve rural areas.⁴⁸ Likewise, the availability of dental care is much lower in rural areas than in cities: almost two-thirds of federally-designated dental health professional shortage areas are located in non-metropolitan areas, with the South reporting the highest numbers.⁴⁹ Rural CHCs, a main source of dental services, commonly report vacant dentist positions.⁵⁰ A similar pattern exists for mental health professionals. About 60 percent of all areas designated by the federal government as mental health shortage areas are located in non-metropolitan areas.⁵¹ Though rural primary care physicians commonly provide mental health services, rural residents are less likely to be seen by a mental health professional, taking part in only about 60 percent of the mental health visits reported by urban residents.^{52, 53}

A limited supply of emergency medical services (EMS) personnel is also a concern for rural areas; 80 percent of EMS personnel in rural communities are volunteers. This is a particular concern given that EMS personnel in rural areas respond to a high share of trauma-related injuries.⁵⁴ Fewer professional personnel, combined with longer travel times and the logistical challenges and costs of rural air and ground ambulance transport, likely impact timely patient access to hospital services.

Timely access to emergency care is an issue for rural patients. Ambulance response times are greater in rural areas than in urban areas. A study in Washington State found that the average response time for rural incidents was twice the response time in urban areas.⁵⁵ Even with air evacuation systems in place, rural residents still face longer travel times to emergency care. A study examining access to trauma care found that of the 47 million Americans who had no access to a trauma center within one hour of travel time, either by ground or air ambulance, most were in rural areas.⁵⁶

Rural Hospitals

Hospitals in rural communities provide a broad range of basic services to rural residents, but also provide chronic and long-term care. Rural America is home to over one-third of the nation's hospitals — about 2,000 facilities — but represent only about 12 percent of national hospital spending, in part because they are smaller facilities on average.⁵⁷ The average number of hospitals per 100,000 people is about 1.5 in urban areas versus 4.4 in rural areas, with rates in remote rural areas as high as 7.6 (see Figure 2.5). The Midwest and the West have a higher number of facilities than other regions relative to their population. Hospitals in the West are more dispersed while hospitals in the Midwest tend to report lower patient volume. Hospitals in the rural South and in Appalachia typically serve more minority populations and fewer patients than those in the rest of the country.⁵⁸

Although hospitals are smaller in rural areas, there are slightly more beds per 1,000 residents in rural areas than in urban areas. Rural areas have an average of 3.2 beds per 1,000 compared to urban areas with a ratio of 3.0 beds per 1,000. However, occupancy rates at rural hospitals tend to be lower in rural areas, with 70 percent of rural hospitals reporting occupancy rates under 60 percent, compared to 40 percent for urban facilities.⁵⁹ With fewer patients to cover the fixed costs of operation, rural hospitals often face economic stress.

Rural hospitals also are more likely than urban ones to offer long-term care services, including home-health, skilled nursing, hospice and assisted living.⁶⁰ Many of these services are delivered in hospitals and include those provided under the Medicare swing-bed program. Long-term care facilities and home health agencies (both hospital-based and freestanding) are also disproportionately located outside of metropolitan areas. Nearly one-third of all skilled nursing facilities and one-half of nursing homes are located in rural areas.

In most cases, rural hospitals are not-for-profit or government facilities that play an important role in their communities' economic and civic lives. Many have formal or informal relationships with other local health care providers. They are heavily dependent on public programs, with 60 percent of their revenue derived from Medicare or Medicaid, compared to less than 40 percent for most urban hospitals. Roughly 45 percent of rural hospitals' revenue comes from Medicare, making that program an important payer.⁶¹

For many years, the Medicare program has provided special payment to certain small and low-volume rural hospitals, bolstering rural infrastructure and preventing the closure of some facilities. For example, about 1,300 rural hospitals qualify as Critical Access Hospitals (CAHs), a federal Medicare designation determined by a hospital's size, distance from another facility and role as a necessary provider in a state.^{62, 63} CAHs receive special Medicare reimbursement along with Sole Community Hospitals and Medicare-Dependent Hospitals (see Appendix 1 for descriptions of special payment categories for Medicare rural hospitals and clinics). CAHs are most prevalent in the Midwest, where almost 40 percent of all hospitals qualify for this designation.⁶⁴ The Indian Health Service operates hospitals in rural areas as well. These hospitals are smaller (fewer than 50 beds) and offer limited inpatient care. Most do not provide surgical or obstetric services.⁶⁵

All Hospitals and Critical Access Hospitals (CAHs) Per 100,000 People by Region and Urban/Rural Distribution, 2007

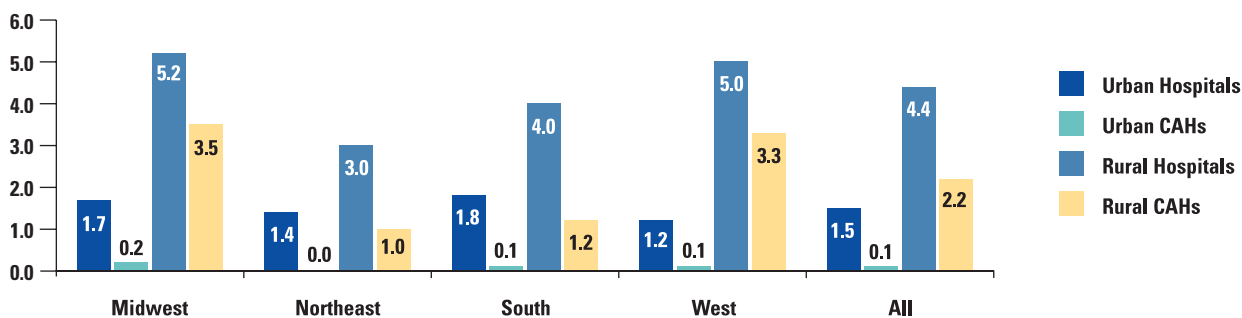


Figure 2.5; Source: UnitedHealth Group Analysis of Area Resource File, 2008. Hospitals are non-federal.

Despite federal support and standing in their local communities, small rural hospitals face multiple challenges: declining occupancy and revenues, difficulty in recruiting skilled workers, competition from urban hospitals, high fixed costs, and low patient occupancy. Rural hospital infrastructure often suffers from aging plant and equipment. For example, over one-half of CAHs are more than 40 years old.⁶⁶ The financial condition of rural hospitals varies substantially among different payment classifications, with certain rural referral hospitals reporting higher relative performance. Their financial condition depends in part on a hospital's delivery of long-term care and outpatient services.⁶⁷

Rural residents tend to use local hospitals for acute stabilization, trauma care and chronic care. Medicare beneficiaries — who comprise a relatively high share of rural populations — are more likely than privately insured adults to receive care locally. This may partly reflect the need for more routine treatment for chronic conditions or emergency dental care locally. Some rural areas with higher population density serve as health care hubs, drawing in people from both local and outlying rural communities. Utilization of hospital services, such as inpatient days, outpatient visits and surgeries, tends to be greater in these areas than in outlying rural regions with lower hospital and physician capacity. In particular, emergency room visits per 1,000 in rural population centers are higher than the rest of the country, including urban areas. This suggests greater use of those facilities as a source of care for residents in outlying counties and also for the possible provision of non-emergency care, including by physicians who use hospitals to provide after-hours care for their patients.⁶⁸

About one-third of hospitalizations of rural residents occur at urban hospitals. This rate has remained consistent since the early 1980s despite changing rural-urban demographics.⁶⁹ Because specialty health services are limited in rural communities, it is common in rural areas for local residents to be admitted to a small local hospital and then transferred to regional or urban facilities for more complex care.⁷⁰

The need for other specialty services, such as inpatient psychiatric care, transplant care or advanced cardiac care also sends patients to hospitals in urban centers.⁷¹ This contributes to a shorter length of stay and lower utilization overall in rural facilities.⁷² Even for some common conditions, rural residents are treated more frequently in urban hospitals than in local ones. Those hospitalizations involve treatments for back problems and coronary artery disease as well as other therapeutic procedures, particularly for cardiovascular conditions.⁷³ Younger patients with private insurance are more likely than older patients to be hospitalized in urban areas.

It is not surprising, then, that hospital use by rural residents overall (either in rural or urban facilities) does not differ substantially from urban residents and may be slightly higher. One study found that rural residents have more adjusted annual hospital admissions than urban residents.⁷⁴ Recent findings by the Medicare Payment and Advisory Commission (MedPAC) confirm this trend for Medicare beneficiaries.⁷⁵

Regional practice patterns rather than urban-rural differences also influence how care is provided. MedPAC found that service use in rural versus urban areas for Medicare beneficiaries overall varies less than service use between regions of the country, suggesting that broader geographic variation in utilization is a stronger force in determining the level of services a beneficiary receives than whether they reside in an urban or rural area. It also points to the influence urban hospital patterns may have on outlying rural referral areas.⁷⁶

Over time, relationships for referrals and transfers have evolved between rural and urban facilities. In the past, many rural hospitals formed rural referral networks, informal alliances and joint clinical programs, and shifted services from inpatient to outpatient settings.⁷⁷ More recently, both large and small-scale integrated delivery systems centered around one or more hospitals have emerged. These systems include hospitals, clinics, coordinated physician staff, interoperable electronic health records and transportation services designed to serve surrounding communities. Smaller integrated systems are often built around formal and informal networks of CAHs and RHCs. Additionally, many small rural hospitals have merged or otherwise aligned with large urban or exurban-based health care systems.

Chapter 3: Quality of Care in Rural Areas

The previous chapter revealed that the delivery system in rural areas is fragmented, and in some cases reliant on urban care delivered to rural residents. The quality of care provided locally and its relationship to care provided in urban areas is the subject of this chapter. How does the quality of rural care compare with that in other areas? And how do rural consumer and physician views compare with respect to quality of care?

Consumer and Physician Views — New Survey Results

The results of our new national consumer survey suggest that rural consumers rate the quality of local care lower than urban consumers, as shown in Figure 3.1, with about one-quarter of rural consumers viewing the quality of local care as fair or poor. While about 63 percent of urban residents viewed the quality of care as very good or excellent, far fewer rural residents felt the same way, with only half rating the quality of care as very good or excellent.

Rural Consumers Rate the Quality of Local Care Lower than Urban Consumers

“How would you describe the quality of care provided in your community?”

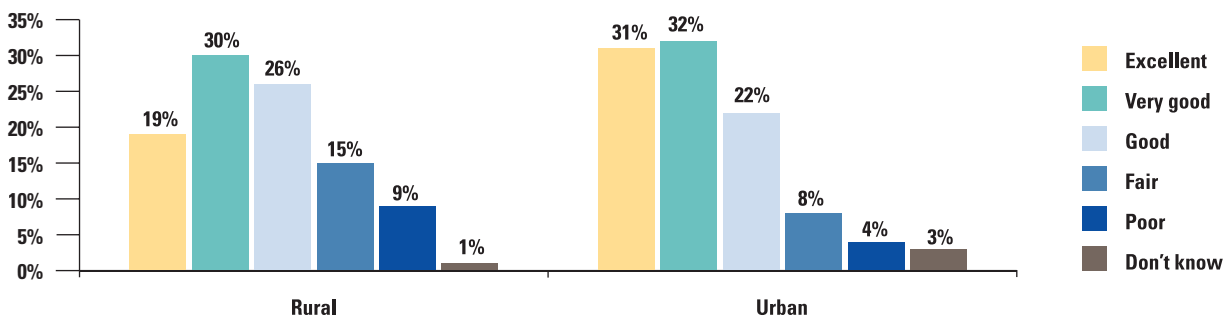


Figure 3.1; Source: UnitedHealth Group/Harris Interactive Survey of Consumers, May 2011

New survey results from our national sample of rural and urban primary care physicians are consistent with this finding. Rural primary care doctors tend to rate the quality of local hospital care as lower than do urban primary care doctors, as shown in Figure 3.2.

The Quality of Local Hospital Care is Rated Lower by Rural Primary Care Physicians than by Urban Primary Care Physicians

“How would you describe the quality of care provided by your local hospital?”

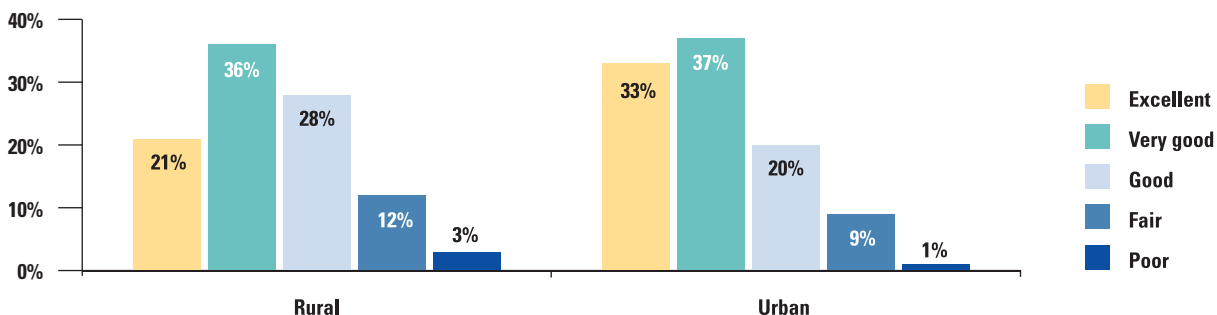


Figure 3.2; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

Previously Published Research

The existing evidence on quality of care in rural versus urban areas is mixed. Quality may be measured differently in rural and urban settings due to structural factors and the manner in which care is provided. For example, because many gravely ill rural patients are often transferred to metropolitan facilities, rural hospitals may appear to have lower mortality rates than urban hospitals.⁷⁸

In 2001, MedPAC reported (based on 1998 – 1999 data) that the quality of care in rural areas — as measured by preventive services and by avoidable outcome indicators — compared to urban areas was roughly equivalent.⁷⁹ However, more recent studies, including our own analysis below, suggest that some rural areas may have missed out on overall improvements in quality that have occurred over the last decade. Rural Critical Access Hospitals perform more poorly than others on process of care and mortality measures for congestive heart failure, heart attacks, and pneumonia. For example, heart attack patients are more likely to be prescribed beta blockers at discharge and receive smoking-cessation counseling at an urban hospital versus a rural facility.⁸⁰ Cancer is diagnosed in rural areas at more advanced stages, is less likely to have been staged, and patients have lower access to high-tech treatments.⁸¹ Rural areas with poor access to obstetric services may have an increased risk for high cost births and neonatal intensive care costs.⁸² Long distances from care providers and gaps in community-based care may contribute to avoidable hospital readmissions for conditions such as pneumonia or congestive heart failure. Overall, however, some data suggest that urban hospitals have a greater likelihood of readmitting patients inappropriately.⁸³

As for patient safety, the evidence is mixed and may depend on measurement effects.⁸⁴ In one study, rural hospitals had lower risk-adjusted rates of patient safety events for 14 out of 19 indicators, but higher rates for five indicators, including anesthesia reactions, postoperative hip fracture, and birth trauma.⁸⁵ More research is needed to better understand the factors that may influence patient safety in rural areas.

New Analysis Comparing the Quality of Rural and Urban Medical Care

In order to examine and compare the quality of care provided by rural and urban doctors, UnitedHealth Group analyzed the most recent data available for our commercial members from our Premium Designation program.⁸⁶ The goal of this program is to support physician practice improvement and to help members make informed decisions about their medical care. The program is designed to assess how frequently doctors are following evidence-based guidelines to monitor and treat various health problems and uses widely accepted measures of care quality (e.g., the share of patients who receive appropriate screening for high cholesterol and the share of patients with high cholesterol who receive recommended treatments for that condition).

Methodology for new analysis

For the analysis in this paper, we adapted the Premium Designation program's physician performance analysis algorithm to compare the provision of evidence-based care in rural and urban areas (with suburban areas treated as urban for the purposes of the comparison). (See Appendix 2 for further background.) The analysis first involved dividing the country into about 300 hospital referral regions (HRRs), which are areas that generally use the same set of hospitals and thus constitute a geographic market for health care.⁸⁷ Within each HRR, we then compared physician performance in rural and urban zip codes. To determine which areas are urban or rural, we relied on a zip code-based designation system that is used by the Centers for Medicare & Medicaid Services (CMS). Focusing on geographic markets

using HRRs helps to reduce the impact of factors that may cause variations in patterns of care but are beyond a physician's control — such as cultural or economic differences or differences in population health across regions.

Within each HRR, we used the same metrics of care quality that are applied in the Premium Designation program, but rather than comparing rural and urban physicians to a national distribution of practice patterns, we aggregated the data for all physicians within an HRR and compared the rural and urban doctors to one another within that region. For example, if urban providers in a given HRR administered HbA1c tests for 1,500 out of the 2,000 diabetic patients for whom that test was appropriate, we would say that urban physicians were successful (compliant to the rule) 75 percent of the time. If rural physicians in the same HRR had 600 similar 'opportunities' to provide evidence-based care, their performance would exceed that of urban physicians if they provided such care to more than 450 patients. The results of the comparison are expressed as the ratio of rural to urban performance. Measures that are less than one indicate lower performance by rural providers and measures that are greater than one indicate superior rural performance.

We developed estimates of relative performance for physicians in each HRR for each of 65 different medical conditions and generated a composite score that aggregated the results for all 65 conditions. Overall, we identified 33 million opportunities for physicians to provide evidence-based medicine to their patients, in some instances with multiple opportunities for a given patient. Fifty percent of those opportunities were for tests and treatments for three conditions: high blood pressure (hypertension), diabetes and high cholesterol/hyperlipidemia. About 85 percent of the opportunities involved care for 10 conditions, which also included screening for cervical and breast cancer, treatments for acute sinusitis, coronary artery disease, asthma, migraine headaches and patient safety, specifically for drug interactions and tests to monitor safe use of medications.

Because of the relatively small numbers of physicians practicing in and people living in rural areas, and because some conditions are relatively uncommon, we did not always have sufficient numbers of opportunities for some measures to perform the analysis or to meet tests of statistical significance. In those cases, we did not include those measures in our analysis.

Results

Overall, we found that measured performance of rural physicians tended to be lower than performance of physicians in urban or suburban areas. On a composite measure of care quality that aggregates the results for a wide range of health conditions, we were able to assess enough data to make valid comparisons in 256 HRRs and we found that rural performance fell below urban performance in 75 percent of those areas (see Table 3.1). In 20 percent of the HRRs that had sufficient data, there was no statistically significant difference between rural and urban areas and rural physicians performed better than urban doctors in 5 percent of those areas. In the typical or median HRR, rural doctors were about 3 percent less likely to provide high-quality care than urban doctors. In HRRs with the lowest levels of relative performance, rural doctors were at least 6 percent less likely to provide high-quality care.

The areas with higher relative performance for rural physicians tend to be located in the Upper Midwest and Northeast or near regional rural population and economic centers in the South and West. Several areas showing relatively strong rural performance are health care markets with more evolved, integrated delivery models, including multi-specialty group practices that often have multiple sites or clinics throughout the community. Areas in the South including Alabama, Mississippi, Louisiana and rural Texas show lower relative rural performance.

The performance of rural doctors relative to urban doctors varies more substantially when examining specific medical conditions. For the top 10 conditions and measures represented in our analysis, Table 3.1 shows the number of HRRs for which we had sufficient data, the share of HRRs with lower, the same, or higher performance for rural physicians relative to urban ones, and the range of variation for rural to urban performance ratios. As noted above, those 10 conditions represent about 85 percent of the opportunities to provide high-quality care that were identified in our data for commercial members.⁸⁸ Notable findings include the following:

- Rural performance was notably lower on cervical and breast cancer screenings. In at least 70 percent of the HRRs with sufficient data, those screenings are provided less often in rural versus urban and suburban areas. Rural doctors were more likely to provide either of those screenings in fewer than 20 HRRs (or about 7 percent of all HRRs). In a typical HRR, rural uptake was 8 – 9 percent less, and in the lowest-performing rural areas the gaps between rural and urban performance grew to 20 percent or more. Patient compliance with physician requests and access to and availability of those screening services may explain some of this gap.
- For measures related to high cholesterol (hyperlipidemia) and high blood pressure (hypertension), performance was much less varied. In roughly half of the HRRs we analyzed, rural doctors provided high-quality care for those conditions about as often as urban doctors, and rural doctors provided better care for high cholesterol in about 19 percent of HRRs. Even in the lowest-performing rural areas, doctors provided evidence-based care about 95 percent or 96 percent as often as was observed for urban doctors.
- For other common conditions, rural performance was close to urban performance in the typical area but deviated more significantly in the lowest-performing areas. For example, rural doctors provided high-quality care for asthma as often as urban doctors and did so nearly as often for diabetes in the typical county. Care quality for asthma was lower in only about three out of 10 HRRs. In the lowest-performing areas, however, rural doctors were 9 percent to 13 percent less likely to provide high-quality care for those conditions.

Relative Rural to Urban Physician Quality Within Hospital Referral Regions							
Conditions and Measures	Number of HRRs with Sufficient Data	Share of HRRs by Rural Quality Relative to Urban Quality of Care			Range of Ratios of Rural/Urban Care Quality Across HRRs		
		Lower	Same	Higher	Median	10th %	90th %
All Conditions and Measures	256	75%	20%	5%	97%	94%	100%
Top 10 Conditions and Measures							
Breast Cancer Screening	241	69%	25%	5%	92%	80%	100%
Cervical Cancer Screening	238	77%	21%	2%	91%	79%	100%
Coronary Artery Disease	207	18%	74%	8%	100%	92%	100%
Diabetes	251	56%	39%	5%	97%	91%	100%
Hyperlipidemia	215	40%	41%	19%	100%	95%	103%
Hypertension	245	38%	53%	9%	100%	96%	100%
Asthma	197	29%	68%	4%	100%	87%	100%
Medication Safety Monitoring	229	43%	45%	12%	100%	92%	103%
Acute Sinusitis	217	28%	59%	13%	100%	97%	101%
Migraine Headache	141	20%	74%	6%	100%	96%	100%

Note: HRR = Hospital Referral Region

Caveats

This analysis compared rural and urban performance within HRRs, which has the advantage of highlighting differences in care within geographic markets but may obscure differences in care quality across regions. In some instances, the metrics may be more indicative of the quality of care provided in the HRR's urban areas than an indicator of overall quality within the HRR. That is, rural quality may look relatively low in HRRs with very high-quality urban providers even if rural quality is above the national average in those areas. Conversely, quality in rural areas may look relatively high in HRRs where urban providers offer lower-quality care even if rural quality is also below the national average. Because HRRs do not have equal populations, some care should also be exercised in drawing inferences about overall quality differences from the HRR-based analysis.

Another limitation of the analysis is that comparisons of care provided by locally-available doctors may not determine the quality of care that patients receive because many rural residents receive care from urban-based providers. Also, the determination of whether a provider was located in an urban or rural area was based on zip codes and in cases where physicians have multiple offices that cover both rural and urban areas the results may not capture all aspects of the quality of care available locally.

Our analysis focused on relative quality as measured by appropriate uses of evidence-based medicine by physicians. Both rural and urban residents often receive primary care services from non-physician providers such as nurse practitioners and at clinics rather than physician offices. These scenarios occur more commonly among rural residents. Claims data for those patients could attribute such care to a physician (particularly if the non-physician professional provided the care under a physician's supervision), but the data may not be captured in all instances, which could improve the assessment of care quality provided in rural areas.

Finally, the analysis also did not take into account any differences in relative patient compliance rates with physician recommendations versus the 'offer' of care (for example, screening programs). However, from the point of view of patients' health, it is 'uptake' which is indeed the critical metric, and this is what was measured.

Chapter 4: Preparing for Rural Coverage Expansions

The prior discussion illustrated challenges in providing quality care in a fragmented delivery environment to a dispersed population that has substantial health needs and is heavily reliant on publicly-funded coverage. Although rural residents appear to be receiving similar levels of many basic services as their urban counterparts, questions remain about the quality of some of that care, and regional disparities reveal continuing challenges in areas such as the rural South. As coverage expansions enacted in recent health reform legislation take shape, rural communities are likely to see greater demands on existing health care systems. We discuss the nature of those demands below.

New Projections for Rural Coverage Expansions

Under the Patient Protection and Affordable Care Act (PPACA), the majority of the newly-insured will enter the health system through Medicaid and state health exchanges. To measure the impact of this expansion, we developed estimates of enrollment in Medicaid and the exchanges in urban and rural counties over the next decade using a micro-simulation model developed by The Lewin Group and county-level census data (see Appendix 2 for methodology). We estimate that by 2019, an additional 8.1 million rural residents could be enrolled in Medicaid or state health exchanges, compared with what would have happened without the PPACA legislation. Since some of those people would have had other sources of coverage, the net rural coverage expansion is estimated to be 5.4 million (though this is subject to uncertainty).

Increases in the Insured Population Under 65 Years of Age (in Millions) by Region and Type of Rural Area by 2019, Compared to Previous Law					
	Midwest	Northeast	South	West	Total
Total U.S.	5.2	4.1	14.2	6.5	30.1
Urban	4.0	3.7	11.3	5.7	24.7
Rural	1.3	0.4	3.0	0.8	5.4
Type of Rural					
Adjacent	0.6	0.3	1.9	0.4	3.3
Small Population Center	0.4	0.1	0.7	0.3	1.5
Remote	0.2	0.0	0.3	0.1	0.6
Increase in Insured Populations Under 65					
Total U.S.	10.6%	10.2%	18.7%	12.8%	13.9%
Urban	10.3%	10.1%	18.2%	12.4%	13.5%
Rural	11.6%	11.2%	20.7%	16.8%	16.1%
Type of Rural					
Adjacent	10.6%	11.3%	20.3%	16.1%	15.7%
Small Population Center	11.8%	10.8%	20.8%	16.9%	16.0%
Remote	15.4%	12.3%	22.8%	21.7%	19.4%

Table 4.1; Source: Analysis of HRSA Area Resource File and Lewin Health Benefits Simulation Model. Figures may not sum to totals due to rounding.

Rural areas could experience a proportionately higher increase among their non-elderly insured population than urban areas. As shown in Table 4.1, we estimate that there might be an increase of 16.1 percent in the insured population in rural areas versus 13.5 percent in urban areas by 2019. Remote rural areas might see the highest proportional increase in the non-elderly insured population — over 20 percent in remote parts of the rural South and West. Medicaid enrollment in rural areas could increase more than in urban areas in almost 40 percent of states.

Coverage Expansions and Primary Care Availability

Growth in the share of the insured population may exacerbate existing pressures on the supply of primary care physicians. While some observe that overall service levels for rural beneficiaries are similar to those in urban areas, it is also the case that:

- Twelve million Americans live in counties with fewer than 33 physicians per 100,000 residents (a ratio that the federal government uses to designate areas with a shortage of primary care physicians, as described in Appendix 1).
- About five million (43 percent) of those individuals reside in rural counties, predominantly in the South and Midwest, as shown in Table 4.2 below.
- Nearly half of the rural areas that have a limited supply of primary care physicians are located in areas adjacent to urban areas, mostly in the South.
- There is a lower supply of pediatricians and obstetricians/gynecologists (ob/gyns) in rural areas than primary care physicians overall. While the ratio of primary care providers per 100,000 residents in rural areas is about two-thirds that of urban areas, it is far lower for pediatricians and ob/gyns, 34 percent and 45 percent respectively (see Table 2.2).

Millions of People in Counties with Fewer Than 33 Primary Care Physicians Per 100,000, by Region and Type of Rural County, 2009.					
	Midwest	Northeast	South	West	Total
Total	2.7	0.2	7.9	1.3	12.1
Urban	1.3	0.1	4.6	0.8	6.9
Rural	1.4	0.1	3.3	0.4	5.2
Type of Rural					
Adjacent	0.5	0.0	1.7	0.2	2.5
Small Center	0.2	0.0	0.5	0.1	0.7
Remote	0.7	0.0	1.2	0.1	2.0

Table 4.2; Source: UnitedHealth Group Analysis of HRSA Area Resource File. Figures may not sum to totals due to rounding.

Even in counties with a higher ratio of primary care physicians to population than that described above, the availability of those providers may not be sufficient to meet community needs. About three times as many rural residents live in counties with ratios considered “inadequate” (under federal designation) than do those who live in “shortage” areas.

With the possible expansion of coverage to 5.4 million newly-insured individuals in rural areas through health insurance exchanges and Medicaid, specific regions of the country will feel this pressure even more. We mapped the effect of new coverage expansions against areas with low primary care capacity to identify where pressures will be greatest. About 20 percent of rural residents reside in counties where primary care capacity is relatively low and where the expected increase in the insured population is high relative to other counties (details provided in Appendix 2). Most of those rural residents live in counties adjacent to metropolitan areas. These areas tend to be in the South and often have the strictest laws restricting professionals' scope of practice. Figure 4.1 shows the areas of the country with relatively high estimated increases in the insured non-elderly population and low primary care capacity, with darker areas having the greatest challenges.

Primary Care Challenge by County, Starting in 2014

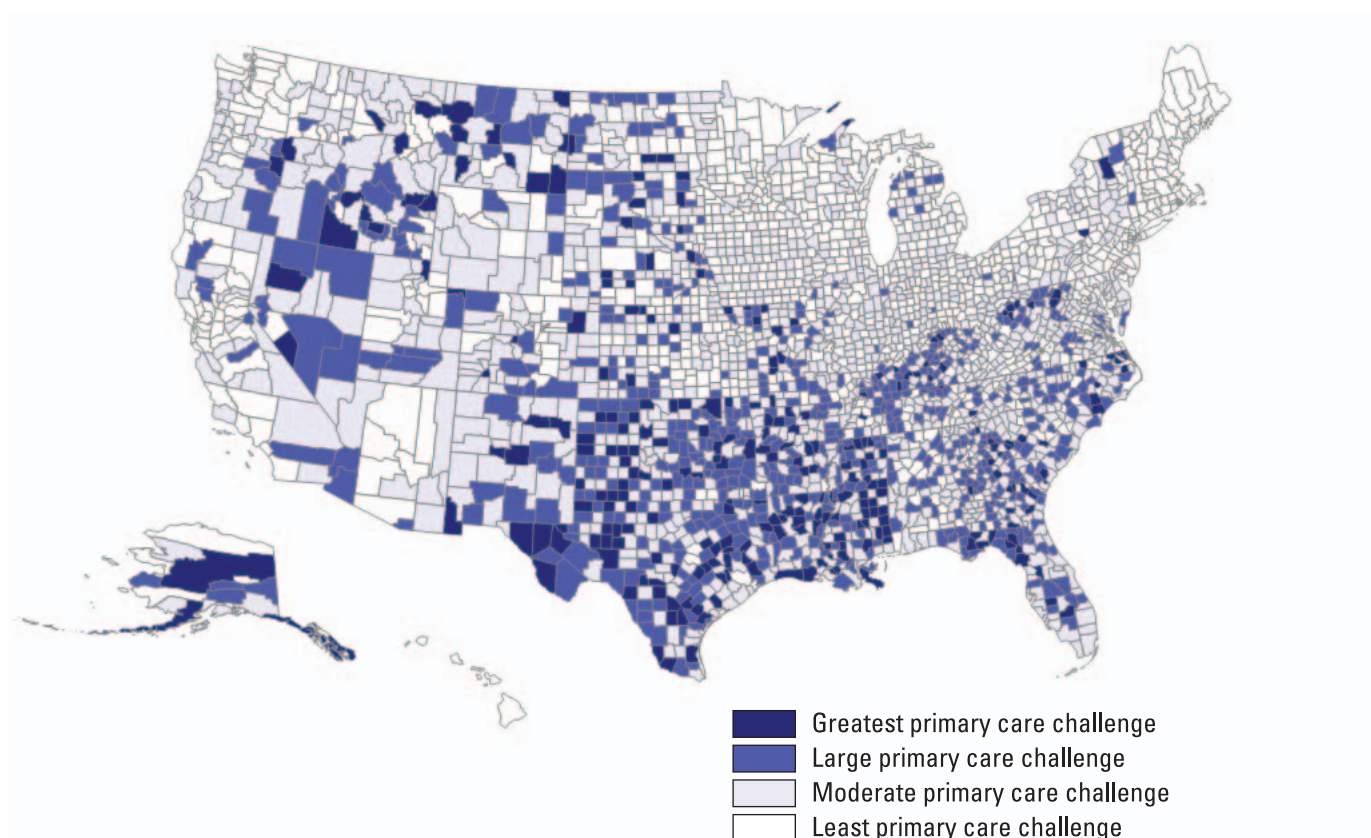


Figure 4.1; Source: UnitedHealth Group Analysis of HRSA Area Resource File

Our new national survey shows that both rural and urban primary care physicians foresee access difficulties over the next few years: almost half of rural primary care doctors expect a shortage compared to 37 percent of urban physicians. An additional one-third of rural physicians believe there will be a shortage of primary care providers, but predict that this will be lessened by non-physician professionals and clinics, as shown in Figure 4.2. Similarly, we found that rural consumers are more likely than urban consumers to anticipate a shortage in primary care physicians.

This expectation may partly be due to the aging of the physician workforce in rural areas. About 27 percent of the rural, clinically-active primary care physician workforce is over 55 years old. In remote rural areas the number rises to 29 percent.⁸⁹ Replacing retiring physicians will be difficult given the professional isolation, limited time off and lack of spousal employment opportunities new rural physicians are likely to face. Furthermore, women entering medicine are less likely to choose rural practice.⁹⁰

More Rural Than Urban Primary Care Physicians Expect a Shortage of Primary Care Providers

“Which one statement below best describes the availability of primary care providers serving patients over the next few years in your community?”

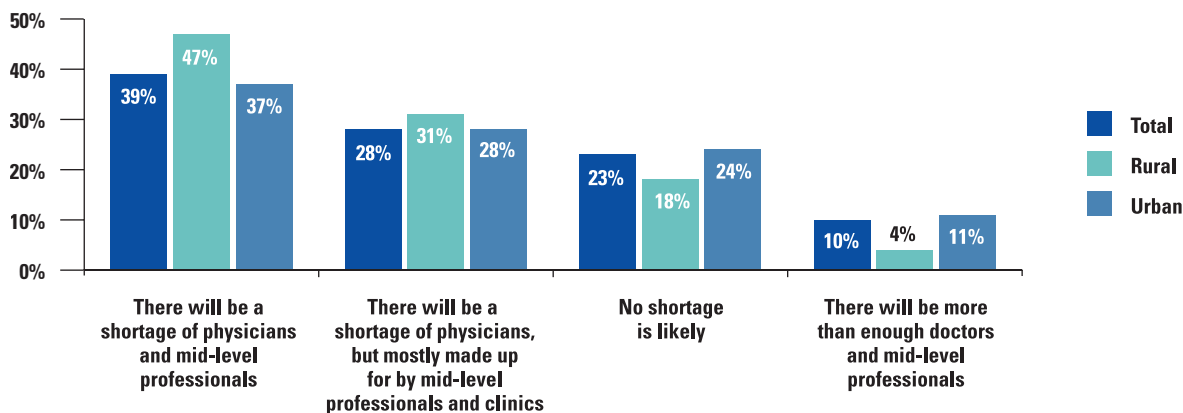


Figure 4.2; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

That said, compared to urban doctors, a higher proportion of rural primary care physicians say they are currently accepting new Medicare and Medicaid patients. However, Medicare and Medicaid patients alike report more difficulties finding local referrals and receiving basic health care services compared with their urban counterparts. In Medicaid, both rural and urban primary care physicians report considerable uncertainty about whether they plan to serve the newly-covered Medicaid enrollees beginning in 2014, as shown in Figure 4.3, although rural primary care physicians are more likely than urban ones to report that they plan to accept Medicaid patients in the future.

A Higher Proportion of Rural Than Urban Primary Care Physicians Currently Say They Accept New Medicaid Patients, But with Uncertain Responses to the 2014 Medicaid Expansion

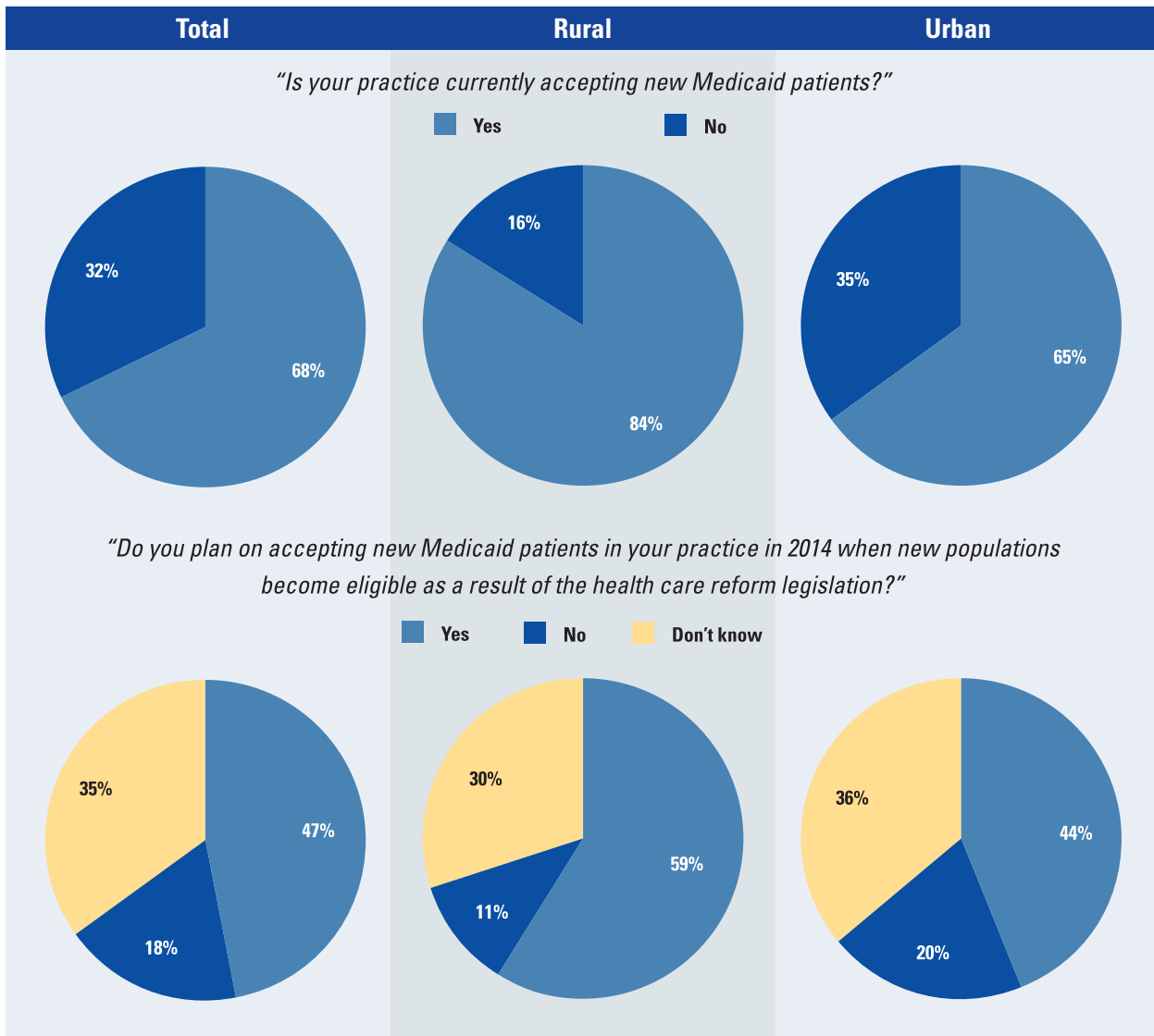


Figure 4.3; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

It is therefore clear that new models are urgently needed to address the current and anticipated pressures on rural primary care and care delivery. As Figure 4.4 shows, primary care physicians have their own views on potential solutions.

Primary Care Physicians Who Expect a Shortage of Primary Care Providers Over the Next Few Years Support a Range of Policy Responses, Particularly New Financial Incentives

“What strategies could most effectively reduce the shortages of primary care physicians and mid-level professionals?”

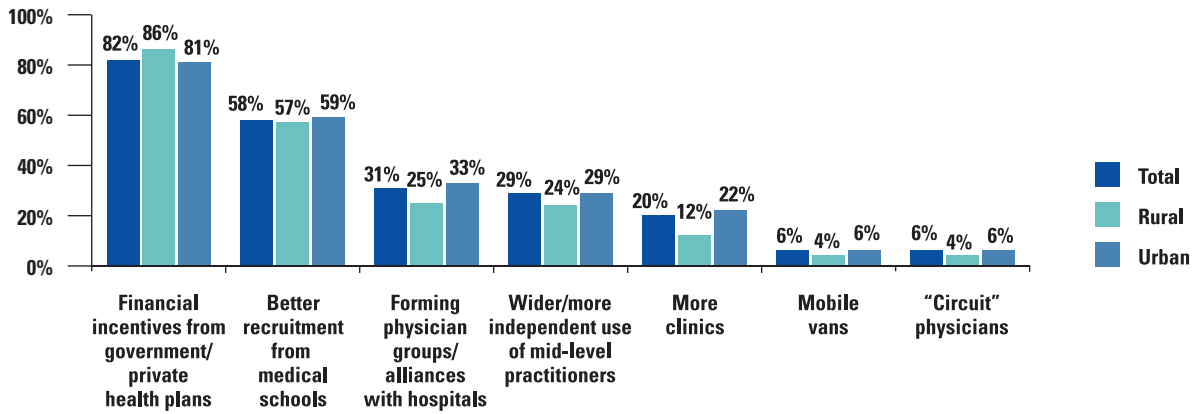


Figure 4.4; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011.

It is to the consideration of such solutions that the rest of this working paper now turns.

Part B – Solutions

Chapter 5: New Models of Rural Health Care Delivery

Chapters 1 through 4 set out the challenges facing rural health care: the range of health needs of rural populations, pressures on care delivery capacity and opportunities for quality improvement.

The solutions we discuss in the following chapters are informed by our practical experience serving the needs of individuals residing in both urban and rural communities. The approaches are varied: Chapter 6 looks at the opportunities telemedicine and telehealth will create, and the related policy changes needed to ensure rural populations benefit to the fullest extent possible. Chapter 7 examines new payment and funding models for developing high-value rural networks. In this chapter we outline six core strategies designed to modernize the rural delivery system:

1. Provide incentives to expand the availability of rural primary care physicians
2. Encourage greater teamwork in rural primary care, including making full use of the skills of advanced nurse practitioners and other health professionals
3. Increase clinical collaboration across rural regions and with urban providers
4. Support greater integration and coordination of rural care with health information technology
5. Use mobile infrastructure to bring care to rural areas
6. Adopt new approaches to improving consumer health and wellness, including new alliances with third sector/non-traditional partners.

Provide Incentives to Expand the Availability of Rural Primary Care Physicians

As discussed in Chapter 4, there have been long-standing concerns about primary care capacity in rural areas. In response, state and federal programs have employed financial incentives to encourage health care providers to practice in rural areas. States, in collaboration with local communities, use a wide range of solutions intended to attract physicians and non-physician providers to rural areas, including loan repayment programs for rural physicians, grants to medical programs with rural education and training and programs for non-physician providers.⁹¹ Scholarships and loan forgiveness opportunities offered by the National Health Service Corps (NHSC) encourage recent medical graduates, including dental and mental health providers, to begin their practice in physician shortage areas, many of which are located in rural areas.⁹² Recent legislation gave NHSC an additional \$1.5 billion to place an estimated additional 15,000 primary care providers in medically-underserved communities. Sixty percent of these providers will be located in rural areas.⁹³ J-1 visas have also been granted to foreign physicians willing to work in shortage areas.⁹⁴

Improving primary care physician reimbursement in public programs has been pursued to increase physician availability in rural areas given the high number of Medicare and Medicaid patients served. However, states in the South and West with low numbers of primary care physicians already pay more generous reimbursement to try to recruit physicians than other states: Medicaid rates are 82 percent of Medicare rates in rural states with low primary care capacity, relative to 55 percent in states with greater primary care capacity.⁹⁵

PPACA requires that states pay primary care physicians Medicare rates for Medicaid beneficiaries for 2013 and 2014 (the federal government will pay the differential payment in full). The law makes Medicare primary care professionals whose practices are at least 60 percent dedicated to delivering primary care eligible for a 10 percent bonus.⁹⁶ In theory this additional funding could help retain and recruit primary care physicians to rural areas. However, in practice, some rural primary care physicians may not qualify for the bonuses since a higher portion of their practice is dedicated to specialist services (compared to physicians in urban areas).

Although the federal support described above will continue to help maintain capacity in rural areas, it may not lead to the increased level of capacity that will be needed in the future. As coverage expansions are implemented, other approaches will be necessary to help address primary care demands. Rural hospitals, which may have to offer lucrative contracts to recruit physicians away from urban markets, might in the future focus recruitment efforts on issues such as informal professional regional support networks and job-sharing.⁹⁷ Other approaches might encourage greater involvement among retired physicians. States could facilitate this approach by enacting sovereign immunity for provision of free care.

Primary care medical homes also represent an approach that has the potential to improve rural primary care physician recruitment and retention by providing opportunities for gain-sharing from improved preventive and ongoing care coordination. (A forthcoming working paper in this series will provide more detail on these initiatives.)

Encourage Greater Multidisciplinary Teamwork in Rural Primary Care

Rural areas have responded over time to the relative scarcity of primary care physicians by increasing the use of non-physician primary care providers. The role non-physician primary care professionals play is significant. Non-physician providers have substantially increased primary care capacity in all areas, but particularly in remote parts of the rural West (see Table 5.1).

Primary Care Providers Per 100,000, by Region and Type of Rural County, 2008					
	Midwest	Northeast	South	West	Total
Primary Care Physicians					
Total U.S.	99.4	125.0	87.2	93.3	98.1
Urban	109.4	129.6	94.4	95.5	104.5
Rural	66.0	81.5	57.7	73.5	65.0
Nurse Practitioners and Physician Assistants					
Total U.S.	54.7	88.0	60.5	66.0	65.5
Urban	57.4	90.1	65.3	66.3	68.8
Rural	45.5	68.6	41.2	64.0	48.7
All Primary Care Providers					
Total U.S.	154.1	213.0	147.7	159.3	163.6
Urban	166.8	219.7	159.6	161.8	173.3
Rural	111.5	150.1	98.9	137.5	113.7

Table 5.1; Source: UnitedHealth Group Analysis of HRSA Area Resource File. Figures may not sum to totals due to rounding.

A statistic that underscores their value in the rural health system is that the number of individuals living in counties with fewer than 33 primary care providers per 100,000 residents decreases from 13 million to fewer than 2 million people when non-physician primary care providers are counted.

Despite the valuable role that non-physician professionals already play in delivering primary care, there are few studies comparing the performance of physicians and nurse practitioners with the same degree of independence.⁹⁸ Various studies have concluded, however, that nurse practitioners provide care that in specified circumstances is comparable to the care provided by physicians.^{99, 100} Analyses of non-physician providers have also suggested that these professionals have the capacity to provide a majority of primary care services.¹⁰¹ Non-physician providers are trained to refer patients with complex problems to physicians and are able to provide services such as medication counseling, developmental screening or case management. Further, non-physician providers can play an important role in filling the specialist gap in rural communities. Advanced-practice psychiatric nurses, for example, have proven successful in delivering mental health services to patients in areas designated as mental health professional shortage areas.¹⁰²

Results from our new national survey (See Figure 5.1), show that nearly two-thirds of rural nurse practitioners and physician assistants in primary care practices *are* currently able to see patients independently. However, that means that a full one-third of nurse practitioners are not. In some regions, that share is far higher.

Over One-Third of Rural Nurse Practitioners and Physician Assistants Do Not See Patients Independently

“What percentage of nurse practitioners or physician assistants in your practice ... ?”

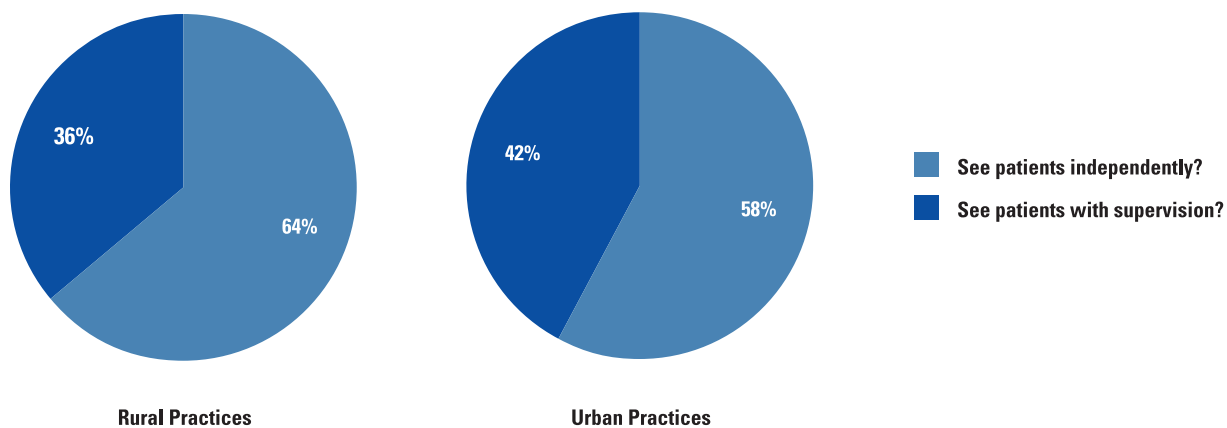


Figure 5.1; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

In many states, non-physician providers are prevented from performing a wide range of primary care services due to narrow scope of practice laws. These laws are most prevalent in the South, where some of the most challenging access problems remain. While some states allow advanced practice nurses to see patients and prescribe medications without a physician’s supervision, a majority of states do not. Other states have adopted various levels of physician oversight depending on geographical location, practice area, and/or the services provided.¹⁰³ In Iowa, for example, advanced practice nurses practice without physician oversight and are permitted to administer prescriptions without restriction, an allowance that has helped improve access to care in rural areas of the state.¹⁰⁴ Because on-site supervision by a physician is not always possible, non-physician professionals are already assuming independent practice roles in some rural and underserved communities.

Most primary care physicians say they believe that the quality of care would improve with more multidisciplinary team care and with a greater role for non-physician providers, as shown in Figure 5.2. Physicians in rural and urban areas share the view that non-physician providers should be used more extensively, although most physicians oppose using nurse practitioners and physician assistants more extensively without supervision.

Primary Care Physicians in Rural and Urban Areas Support More Team-Based Care, with Physician Supervision

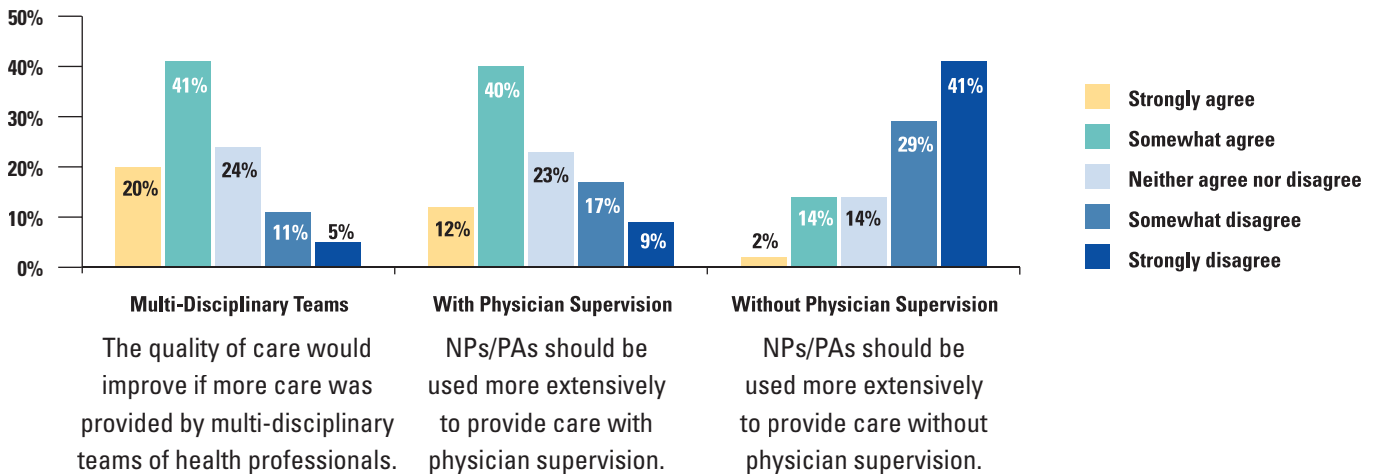


Figure 5.2; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

Changing state-specific scope of practice laws to allow non-physician primary care practitioners to diagnose illnesses, order tests, write prescriptions and make referrals could bolster primary care capacity in rural areas. Studies from the Institute of Medicine (IOM) have found that increasing the use of non-physician providers can help reduce wait times, improve patient satisfaction and allow physicians more time to address complex cases. For example, the IOM found the use of practitioners helped meet growing demand for colon cancer screenings in outpatient suites and hospital endoscopy centers. Licensing non-physician providers could further expand access to care and increase non-physician provider participation in telemedicine, although this would require shared certification and licensure standards. The National Council for State Boards of Nursing (NCSBN) has proposed addressing barriers to scope of practice through universal licensure, accreditation, certification and education across the U.S. The IOM recently suggested that nurses should practice to the full extent of their education and training to meet the impending demands of health care reform.¹⁰⁵

Greater use of guidelines and protocols by providers may also help to expand the use of non-physician providers appropriately. For example, Geisinger Health System adopted such guidelines and protocols for common conditions such as hypertension and simple congestive heart failure — as well as increased use of telemedicine tools such as electronic reminders and monitoring. This enabled the health system to deploy those professionals more effectively.¹⁰⁶ Including pharmacists and social workers as part of the team approach can add to a care team’s ability to provide primary care services.

Improve Clinical Collaboration Across Rural Regions and with Urban Providers

Improving coordination and management of care in rural areas is essential, especially when trauma and highly-specialized care facilities are significant distances away, making timely care difficult. New approaches seeking to improve the provision of care in rural areas must consider the relationships between rural hospitals and urban counterparts. Evidence from Minnesota and other locales suggest that service-specific regional referral and coordination programs can significantly improve quality and reduce cost. The Minnesota Heart Institute has developed a state-wide referral program for acute myocardial infarction (heart attack) that has optimized care for patients up to 200 miles away from Minneapolis.¹⁰⁷ Another opportunity to better coordinate rural providers to improve care is to reduce the time between a rural heart patient's first medical contact with emergency personnel and a coronary artery "balloon" dilation procedure performed in a hospital.

Enhancing clinical integration in rural communities, increasing collaboration and communication with urban facilities, and fostering a focus on rural population health requires providers to develop capabilities in advanced analytics and risk management. It also requires communities to establish cooperative systems to share clinical data across a range of providers. These goals and needs are explored further in Chapter 7.

Collaborative relationships on capacity can help meet local infrastructure needs. Dartmouth-Hitchcock's Medical Center in New Hampshire has established a Rural Emergency Services and Trauma Center (CREST) program. This center helps improve emergency care for rural patients by connecting patients in northern New England with specialty care at the main medical center. CREST also operates the Dartmouth-Hitchcock Advanced Response Team. The team provides ground and air transportation to medical communities in Northern New England.¹⁰⁸

Another approach would be to develop new uses for under-utilized or outdated rural facilities. Small hospitals might become emergency facilities, ambulatory surgery units with observation beds or sites for provision of community-based services, according to specific community needs. Approaches could also include sharing of resources, clinical expertise and diagnostic equipment.¹⁰⁹ Additionally, existing federal and state funding streams for a range of health centers and other programs can be leveraged to maximize the use of resources in a rural area and help finance a regional strategy. In Georgia, for example, the state provided incentive funds to hospitals and clinics to find ways to coordinate services in rural areas and make the system more efficient, more oriented to primary care, and better able to provide long-term care services. Such an approach may require changes in the law to allow funding from different programs to be combined most effectively.

Additionally, states can deploy in rural areas managed long-term care programs to provide coordinated care for aging Medicaid enrollees. These models provide access to community services locally, facilitate transportation to physician visits and use care managers to coordinate clinical services, including urban specialty care. These interventions can help to avoid unnecessary visits to distant hospitals or nursing homes and enable rural patients to stay in their communities.

Support Integration of Rural Health Care Using Health Information Technology

As many rural residents use a range of local care and also travel to urban areas for some of their care, it is important that their medical information follow them across care settings, particularly for emergency care and hospital transfers. Broader adoption of electronic health records (EHR) can help. Greater integration of patient-level health information technology can improve the ability of rural physicians, safety net providers, health centers and small hospitals to serve patients by linking their health history with multiple doctors, clinics and facilities and better coordinating their care. For example, clinicians at Holston Medical Group, a physician-led, multi-specialty practice in rural Tennessee, report using systems to improve patient care, increase accuracy of medical information and provide electronic access to medical information. A clinical data repository allows the practice to observe trends in chronic diseases, improve treatment and optimize pharmacy spending.¹¹⁰ Similarly, the Billings Clinic in Montana, a multiple specialty clinic serving patients in several rural states with care delivered through local and regional clinics, uses EHR to improve care coordination and to notify providers of potential drug interactions.¹¹¹ The Marshfield Clinic, a rural Wisconsin multi-specialty group practice with ambulatory care sites throughout the state, has an EHR system that allows providers to access patient diagnoses, medications, and test results at all clinic locations. Marshfield also uses this technology to conduct e-prescribing and to track community health measures.¹¹² Additionally, robust health information exchanges in rural areas could generate valuable health information to help providers access and comply with the most up-to-date, evidence-based guidelines and improve the quality of care.

Federal support in the form of incentive payments (and penalties) through the Medicare and Medicaid programs for adoption of health information technology can play an important role in expanding the use of EHRs in rural areas. Hospitals and Critical Access Hospitals (CAHs) not engaging in meaningful use of EHR will be subjected to penalties (reduced payments), making adoption even more important.¹¹³ The Regional Extension Center program enacted in ARRA provides training and support for providers who want to adopt EHRs. ARRA also encourages greater use of health information technology through investments in EHRs and information exchange in so-called Beacon Communities.¹¹⁴

To date, however, capital constraints, as well as a limited number of health information technology professionals in rural communities, have limited information technology adoption. Rural hospitals, particularly CAHs, have lower rates of adoption than urban hospitals, including certified EHR technology, computerized physician order entry (CPOE), lab order entry and medication administration records.¹¹⁵ Although cost-based reimbursement under Medicare has provided CAHs with extra resources for health information technology infrastructure, these facilities still struggle to advance their adoption of new technology. For example, only 8 percent of CAHs use CPOE compared to 20 percent of urban hospitals.¹¹⁶

Communications technologies, including data and information systems, are also critical to public health activities. Unfortunately, many rural public health departments lack web connectivity and surveillance services. A study of 1,200 local health agencies found that while 100 percent of local health agencies serving populations of 500,000 or more had web connectivity, only 65 percent of agencies serving populations of less than 25,000 had Internet access.¹¹⁷

The incentives provided under ARRA could spur adoption of health information technology across rural communities and lead to better integration of care. More broadly, educating physicians and rural hospitals about how EHRs can reduce time spent on paperwork and charts and optimize staff

availability for other services and tasks should also be part of a strategy to encourage adoption.¹¹⁸ Ongoing technical support and management counseling for small rural providers will be crucial and could be linked with efforts undertaken by local or regional providers. Further, regional electronic linkages with urban facilities or with hospitals in rural population centers will improve the specialty care rural patients receive, particularly if follow-up care instructions are accessible by local primary care physicians or by local health centers.

Use Mobile Infrastructure to Bring Care to Rural Areas

Developing ways to bring health care services — both primary care and specialty care — into communities can also involve new mobile models of care. While trauma and other emergency facilities need to be maintained locally, other services can sometimes be imported on an as-needed basis or on a pre-determined schedule. Tapping into urban specialist markets in a coordinated way with a regional approach can help create a more nimble infrastructure that can be quickly adapted to changing community needs, including dental, behavioral health and vision care.

In Chapter 6 we focus on the role telemedicine can play in helping clinics expand services in rural areas by connecting patients to specialists. Mobile clinics equipped with new technology can move beyond traditional functions and provide a broader range of services. Another way to do this is to encourage and facilitate specialist travel to rural areas. An increasing trend is for cardiologists, orthopedists and pediatric sub-specialists to travel on a so-called “circuit” into rural communities to provide care. A circuit could mean traveling to 10 outlying sites including physician offices and small hospitals.

Box 5.1; Optum’s Portable Health Care Services

Through its Logistics Health division, OptumHealth provides portable and customized health care services for military personnel and commercial clients for their widely dispersed workforces. Physical and dental examinations for medical readiness, immunizations, disability exams for veterans, and behavioral health exams, including post-deployment assessment, are examples of its services. Rapid deployment of health care programs at the worksite or through location events can help bring care directly to military personnel and other clients.

www.logisticshealth.com

The Remote Area Medical Volunteer Corps provides one example of an approach that brings mobile infrastructure to rural areas. The Corps, a non-profit group providing free medical care, dental care, eye care, veterinary services and education to people in remote areas of the U.S., with a particular focus on Appalachia, hosts periodic health fairs where volunteer physicians and other health care professionals treat hundreds of people in a single day. Dental and vision care are most commonly provided. Patients can have their eyes examined, obtain a pair of glasses and receive treatment for serious dental problems, including extractions and restorations.¹¹⁹

Another example based at a provider is the North Mississippi Medical Center in Tupelo, Mississippi, the largest rural health care provider in the U.S. This facility addresses health problems in surrounding rural areas by sending services out to communities, including wellness education, health fairs, screenings, immunizations and mobile mammography services.¹²⁰

Bringing specialist capacity into the local market strategically can enable rural communities to expand services to meet need. In conjunction with providers and health plans, rural communities could encourage and facilitate greater use of various types of mobile capacity. Dental vans, mobile mammograms, non-invasive tests, and portable health screening can fill important quality and provider gaps identified in Chapters 3 and 4. Rural communities may look to existing infrastructure throughout the region, such as emergency management vehicles, to develop capacity in this area. Certain specialty services may best be provided through periodic circuits to rural locations since many rural residents live in counties adjacent to metropolitan areas. State and local laws pertaining to provider credentialing may need to be adjusted to allow for use of these approaches. Ensuring appropriate follow-up care for patients will be an important ingredient for the success of these strategies.

Adopt New Approaches to Improving Consumer Health and Wellness

Rural consumers report greater difficulties accessing the type of health and wellness programs (i.e., disease management, smoking cessation and health education) that are becoming increasingly common elsewhere, as shown in Figure 5.3:

Rural Consumers Find it Harder to Locate and Enroll in Wellness and Health Improvement Programs

“How difficult is it to find local referrals for... programs to improve your health?”

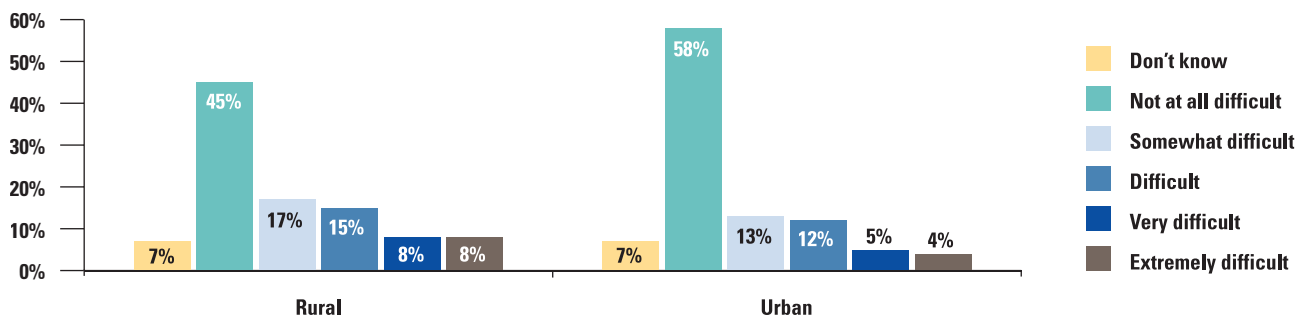


Figure 5.3; Source: UnitedHealth Group/Harris Interactive Consumer Survey, May 2011

Strategies to improve rural health need to approach wellness and chronic disease risk reduction in new ways. Possible strategies that can be deployed by communities, state and employer purchasers, health plans and providers include using non-traditional providers, new technology (e.g., virtual visits), consumer outreach models (telephonic and web-based), partnerships with local community-based organizations (including faith-based organizations) and lay health leaders. In a review of diabetes self-management education programs, researchers found that programs carried out in community gathering places, such as churches and libraries, can improve glycemic control effectively for adults with type 2 diabetes and have the potential to be especially effective in rural areas because of their alignment with cultural norms and practices.¹²¹

Employers can develop and support wellness programs and scale these programs for their rural employees. Examples of such programs include health risk appraisals, on-site screenings and telephonic and online support programs to help individuals with specific health needs (e.g., weight loss, medication compliance, smoking cessation). Employers can couple these types of programs,

none of which require significant up-front investment, with incentives for employees and dependents through value-based insurance designs that offer benefit enhancements and/or premium reductions for individuals who use wellness services and achieve specific health outcomes. For larger employers, worksite wellness programs, such as on-site medical facilities, clinics and even labs, can be a solution for improving health in rural areas.

Box 5.2; UnitedHealth Group’s Diabetes Prevention and Control Alliance

The Diabetes Prevention and Control Alliance (DPCA) is a partnership between UnitedHealth Group, the YMCA, large retail pharmacy organizations and the Centers for Disease Control and Prevention (CDC). The Alliance programs — the Diabetes Prevention Program (DPP) and the Diabetes Control Program (DCP) — help people at risk for diabetes prevent the disease through lifestyle changes, such as healthy eating and increased activity, and teach people with diabetes to better manage their condition through education and support from trained pharmacists. These evidence-based programs are delivered by credentialed diabetes educators and pharmacists. The DPP is delivered in a group setting at YMCA facilities, while the DCP is delivered on an individual basis by a pharmacist at a retail pharmacy. Both approaches offer convenient access to rural residents. The DPP can additionally be delivered in alternate sites (e.g., churches, community centers, employer sites) with the same team of diabetes educators.

www.unitedhealthgroup.com/diabetes

New alliances with third sector and non-traditional partners also show promise. Community-based programs that seek to educate rural residents about healthy behaviors can help reduce the onset of chronic disease, prevent injuries and address substance abuse in rural and urban areas alike. Local knowledge, cultural awareness and foreign language proficiency can aid health promotion education and awareness in rural areas. Community members can conduct medical interpretation and translation, and assist in educational efforts. For example, the University of New Mexico’s Health Extension Rural Offices (HEROs) program deploys “health extension agents” to rural communities across the state to work with different sectors of the community in identifying high-priority health needs, connecting those communities to an academic center.¹²²

Box 5.3; UnitedHealthcare’s Community & State Partnership with 4-H

Through a partnership with the National 4-H Council, UnitedHealthcare Community & State is sponsoring a youth engagement program to support 4-H’s Healthy Living focus area, one of the four core values in the 4-H program. 4-H is one of the largest national children-focused organizations, involving state and local governments and school districts, and has a large rural presence. United’s Healthy Living program targets children in underserved communities. The program is being piloted in three Southern states: Texas, Florida, and Mississippi.

www.4-h.org

Chapter 6: New Models of Technology — The Promise of Rural Telemedicine

Advances in communications and information technology are transforming medical care by changing the way care is delivered and how people access medical services. One technology driving these improvements is *telemedicine*: the provision of clinical services using the electronic exchange of medical information, cross-site transmission of digital images and electronic communications (e.g., physician-patient email, remote monitoring of vital signs and video patient consults with physicians). Rapidly emerging as a component of telemedicine is medical care that relies on mobile devices such as cellular phones, personal digital assistants and laptops (often referred to as mHealth). High resolution cameras, digital imaging, the use of smart phones and broadband high-speed connections have dramatically improved the scope and scale of telemedicine’s applicability.

The concept of *telehealth*, often used interchangeably with telemedicine, refers to a broader set of uses of the technology that includes but also extends beyond the delivery of medical care. Telehealth involves using technology to support activities such as remote medical education, health services research and some administrative functions.

In this chapter we assess the modes of telemedicine in use today, the evidence base for the technology’s potential and its particular importance in rural areas. We then explore several ways the technology can be more broadly deployed. These include efforts to:

1. Enhance broadband connectivity
2. Improve and align reimbursement across payers
3. Encourage greater physician adoption
4. Use telemedicine to build primary care capacity in rural areas
5. Increase choices for rural beneficiaries in how they access care
6. Raise patient comfort levels with telemedicine technology and encourage its use in rural care models
7. Update regulations governing use of telemedicine equipment and providers
8. Improve care coordination and patient safety in rural areas

How is Telemedicine Used Today?

By diminishing the impact of distance and time, telemedicine can in theory expand capacity, foster coordinated care, improve the quality and efficiency of the delivery system and support more patient self-management. The types of telemedicine that are most functional today primarily expand the capacity of the rural health care delivery system, making it easier for patients to be seen and treated, especially by specialists. These types of telemedicine include:

- **Transmission of data or images for analysis.** The transmission of images or clinical data from an electronic device to a medical center is known as “store and forward.” Clinical information is “stored” with a patient record and then forwarded to a provider for further review. Dermatologists and radiologists increasingly use this technology as do emergency medical personnel who can

transfer medical information and images from ambulances to hospital emergency rooms. Store and forward technology also supports ongoing remote patient monitoring and management of key medical indicators (e.g., blood glucose levels) in patients with chronic illness.

- **Facilitation of consultations between patients and providers.** These consultations, commonly conducted over the Internet using secure live connections and Web cams, can either substitute for in-person visits or support care between appointments. Audio and online approaches may also be used. In rural areas, video consultations extend the reach of scarce specialists; some federally qualified health centers use video technology for this purpose. The interactive capabilities provided by video also support the technology's use in behavioral health care; federal veterans hospitals use telemedicine to facilitate treatment for Post-Traumatic Stress Disorder. Online care is well-suited to conditions where a one-on-one consult could result in a quick diagnosis, such as respiratory infections, urinary tract infections, acute conjunctivitis and hypertension. Current technology allows patients to connect to more than one provider at a time: a primary care physician can join with a specialist, for example, to confer with a patient. If physicians and patients are not available at the same time, either one can prepare a video report that can be accessed at a later time by the other.
- **Support for patients managing their own health.** Patients can use the Internet to obtain specialized health information and to access online discussion groups for peer-to-peer support. Surveys show that patients are often willing to manage their personal health information over smart phones and are interested in pursuing other types of care delivery via mobile devices.¹²³ Phones now have the ability to store health information like immunizations and prescriptions. When connected to portable medical devices, phones can capture blood glucose levels, blood pressure values and vitals, and transfer information to personal health records. These tools can help people address their health and wellness needs through online care management and wellness programs that teach positive long-term behavior change.
- **Remote monitoring.** Providers use remote monitoring to track changes in important patient vital signs such as weight, body temperature, blood pressure and heart rhythms. Patients wear monitors or use devices such as scales located in their own homes but connected to their physicians' offices, making it possible to monitor a patient's health without an office visit. This remote monitoring supports the early detection of possible health problems (for example, patients with congestive heart failure who suddenly gain weight may be retaining water, a sign of decreased heart function that can be treated with medication). Pharmacists may use information from remote monitoring to counsel patients on the effective and safe use of medications.
- **Intensive care unit (ICU) telemonitoring (e-ICUs).** These programs extend the reach of critical care providers. Specialist physicians and critical care nurses staff round-the-clock tele-ICU centers (or tele-hubs) that receive data from monitoring devices tracking patients in ICUs in small hospitals, including those in rural areas. The ICU specialists in the tele-hub can support the care given on-site by providers who may have less critical care expertise.
- **Telepharmacy.** Remote, rural clinics may not be able to provide a full-scale pharmacy, but access to an electronic connection to a pharmacy and a pharmacist can help patients receive both medications and medication counseling (ultimately improving medication compliance). By connecting pharmacies at urban hospitals to small rural hospitals, pharmacists can guide dispensing technicians to fill prescriptions.¹²⁴ In some cases, however, legal requirements that pharmacists be present for the dispensing of medication may complicate this practice.¹²⁵

- **Enhanced training and provider communication.** Telemedicine technologies enable greater communication among rural providers and can facilitate a virtual professional community, lessening the geographic isolation many providers may feel. Improving collaboration among providers of various specialties, increasing opportunities for medical training and emergency response are all services technology can improve. Telemedicine technology also can help local emergency and disaster response systems connect to specialty care and health care facilities.

Other telemedicine technologies hold promise for the future, although their full realization may be some way off. These include:

- **Telehealth services.** This approach to telemedicine uses cloud computing — servers hosted on the Internet — to allow providers to connect with systems from different organizations and share health data generated from patients remotely. It can, for example, link remote health monitoring, electronic health records and services such as 24-hour call centers. This approach removes the burden of having to invest in telemedicine infrastructure and distributes costs among multiple parties.¹²⁶
- **Robotics.** Telemedicine robots allow doctors to travel virtually to a patient’s bedside. Robots are also beginning to be used in remote surgery, although most robotic surgery is still carried out by on-site surgeons.
- **Clinical kiosks.** These care sites may become a tool to bring medical care directly to patients and help increase access in areas with limited broadband connectivity. When fully realized, clinical kiosks should be capable of taking biometric readings and allowing individuals to upload vital signs with the eventual aim of providing a full diagnostic evaluation and recommendations for treatment without the use of on-site personnel.¹²⁷

While some forms of telemedicine, such as store and forward applications for imaging reads, are commonly in use, other uses of the technology are still developing. About one-half of all hospitals (both rural and urban) used telemedicine in both 2005 and 2006 to consult with other health professionals. Among rural hospitals, about one-fourth participated in tele-cardiology and video teleconferencing for consultations and about 10 percent used tele-emergency services. Steady growth is occurring with e-ICU hubs and their use is increasing in small critical care hospitals. In Montana, hospitals with less than 20 beds have video ICU referral that allows for patient monitoring by specialists and nurses located remotely.

Approximately 200 telemedicine networks currently connect hospitals with outlying clinics and community health centers in rural or exurban areas. Nearly 2,000 facilities participate in these networks. However, participating facilities primarily use their connectivity for education or to perform administrative functions.¹²⁸ Fewer than 10 percent of rural hospitals are engaged in remote monitoring of patients, in a hospital or offsite.¹²⁹ Mobile health monitoring is currently in the pilot stages, with growing interest that could lead to broad and sustainable services in the future.

Box 6.1; Bringing Primary Care and Specialty Services to the Navajo Nation with Telemedicine

UnitedHealthcare serves 24,000 special needs children in the Arizona Medicaid program. Obtaining pediatric specialty services in rural parts of the state is a significant challenge for many children. In 2010, UnitedHealthcare generated a Title V grant for the expansion of telemedicine into Tuba City on the Navajo Nation in Northeastern Arizona. Access to specialty medical care on the Navajo Nation is extremely limited. Children and their families typically must travel 200 miles to Phoenix, the closest urban center, to see a specialist. The Navajo telemedicine program utilizes high-definition technology through an established T1 network that provides hub site services (at regional clinics) to patients presenting from remote locations on the Navajo Nation. Financial support for travel and individual service plans are helping underserved tribal members gain access to needed primary care and specialty services in the most remote areas of Northeastern Arizona.

To generate new information on the uptake of telemedicine by primary care physicians, we conducted a national survey of rural and urban primary care doctors. As shown in Figure 6.1 below, about a third of primary care physicians reported using electronic digital imaging and laboratory systems, but far fewer physicians reported using other telemedicine applications. Rural physicians report being slightly more likely than urban physicians to use telemedicine to consult with specialists and view telemedicine as a way to increase access to specialists.

Telemedicine Adoption by Primary Care Physicians

“In which of the following ways is telemedicine used in your practice today?”

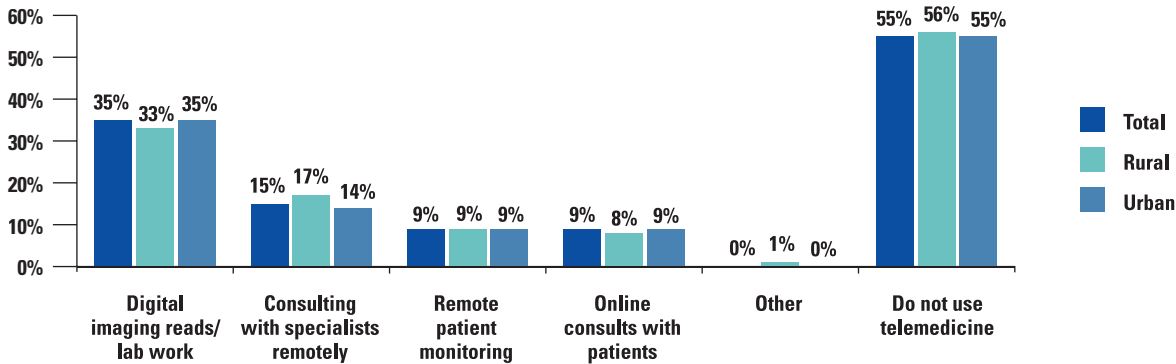


Figure 6.1; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

Further, the survey reveals that over half of both urban and rural physicians say the cost of equipment, along with reimbursement and administrative “hassles,” represent significant barriers to the adoption of telemedicine (shown in Figure 6.2).

Barriers to Telemedicine Perceived by Primary Care Physicians

“Which, if any, of the following do you consider barriers to your use of telemedicine?”

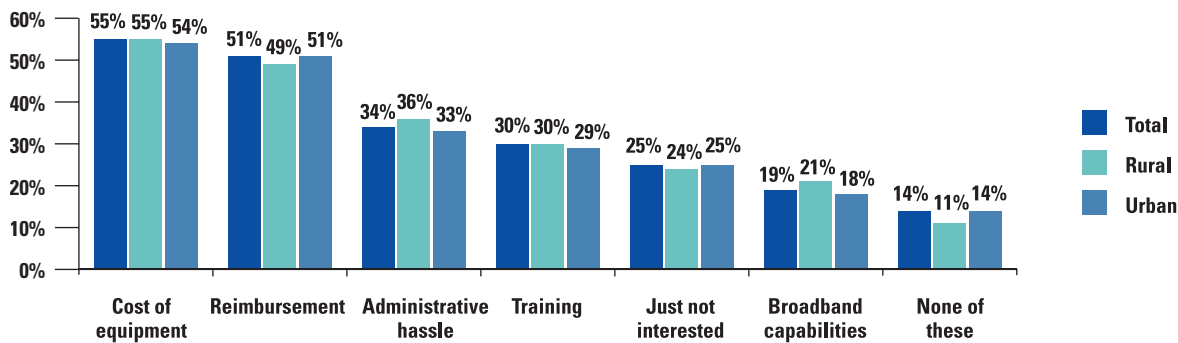


Figure 6.2; Source: UnitedHealth Group/Harris Interactive Survey of Primary Care Physicians, May 2011

The Evidence Base for Telemedicine’s Effect on Cost and Outcomes

Harnessing telemedicine technology to reduce readmissions to hospitals, avoid unnecessary visits to physician offices, improve medication compliance and strengthen communication between patients and health care professionals holds significant promise in practice. Policymakers, researchers, health care professionals and consumers are interested in whether in practice, and to what extent, the widespread adoption of telemedicine technology can reduce costs and improve outcomes.

The deployment of telemedicine is still in its early stages and varies greatly in its use, location, technology, specialty and objectives. As a result of this variation, local travel costs, prices and investments in technology/infrastructure must all be considered in estimations of economic benefit. The wide range of metrics used to measure cost-savings and efficacy across studies currently limits the ability to draw generalizable conclusions about full deployment. Additionally, much of the research on telemedicine originates from small demonstration projects. Recent legislation includes telemedicine in a list of potential delivery reform ideas for the Centers for Medicare and Medicaid Services to test through its new innovation center. The law specifically identifies the technology’s use to treat chronic conditions and behavioral health issues in medically-underserved areas and at Indian Health Service facilities.

Research on cost-effectiveness and health outcomes is, however, starting to generate some initial results:

- An extensive literature review reported that telemedicine reduced time-to-diagnosis, improved access to care for patients in remote areas and improved patient satisfaction.¹³⁰
- A 2005 Veterans Affairs study in Florida showed a 50 percent reduction in hospital admissions and an 11 percent reduction in emergency room services using home telehealth services.¹³¹
- A review of 13 tele-ICU studies found that telemedicine in the e-ICU reduced ICU mortality by 20 percent and reduced the average length of ICU stays by an average of 1.26 days. However, the use of telemedicine did not reduce hospital mortality or overall length of stay.¹³²
- An Agency for Healthcare Research and Quality (AHRQ) review of 97 articles revealed that much of the literature on effectiveness is focused on the practice of dermatology. While the literature shows that the accuracy of diagnosis in store-and-forward teledermatology is comparable to

in-person encounters, some studies have shown interactive teledermatology to be inferior to in-person diagnosis, though health outcomes are comparable. These results may be due to the use of outdated technology.¹³³

- The Veterans Administration (VA) found that veterans who used text messaging to report blood pressure readings taken at home to their care providers achieved blood pressure goals sooner than those using other methods.¹³⁴
- Researchers are also identifying organizational and staffing benefits from telemedicine, especially in ICUs. A recent study found that when e-ICU staff monitored patients virtually, bedside staff had more time to spend with families and to perform tasks such as tracking data.¹³⁵
- A recent study of the Health-e-Access web portal, which connects pediatric patients in child care centers, schools or community centers with their own providers at local pediatric centers, reported a 22 percent reduction in emergency department visits among children with telemedicine access over a seven-year period.¹³⁶

Approaches to Increase and Improve the Use of Telemedicine in Rural Areas

While telemedicine technologies can be deployed across different geographic areas and care settings, they are particularly well-suited to rural areas, where distances, low patient density and low provider density contribute to challenges in accessing and providing care. Here we discuss eight strategies to make fuller use of this potential.

1. Expand broadband connectivity to enable growth of telemedicine adoption.

To successfully engage in telemedicine, physicians must have the necessary infrastructure — access to broadband, video-conferencing technology and telemetry-enabled medical-devices. The lack of broadband service in rural areas has been a key barrier, though greater deployment of broadband is underway in many communities. About 60 percent of rural areas have broadband compared to 70 percent of urban areas.¹³⁷ However, local regulations (e.g., zoning requirements for cell towers) can delay or halt efforts to develop the infrastructure needed to provide telemedicine. Companies seeking to establish broadband networks face numerous obstacles such as accessing utility poles and sites for wireless towers.

The federal government provides support for broader deployment of telemedicine infrastructure through several different agencies with interests in supporting rural communities' access to health care and advanced technology. The U.S. Department of Agriculture assists rural utilities to expand, update technology and adopt new technology such as distance learning and telemedicine through its Rural Utilities Service. In a public-private partnership with local utilities organizations, the program (with funding provided in the American Recovery and Reinvestment Act (ARRA)) provides eligible rural health care providers discounts on the purchase of telecommunications services. The U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) is also focused on deploying appropriate infrastructure across rural America. As a first step, the NTIA is analyzing the current availability of broadband across the country.¹³⁸

The Federal Communications Commission (FCC) focuses on ensuring that consumers in rural areas have access to basic telecommunication services and encourages the deployment of advanced telecommunication services in rural areas. Its Universal Service Rural Health Care Program encourages the creation and use of broadband networking services among health care providers serving rural residents nationwide. In November 2007, the FCC selected 69 entities to participate in the pilot. Participants were reimbursed up to 85 percent of the costs associated with construction of state or regional broadband health care networks; connecting to Internet2 or National Lambda Rail; or connecting to public Internet capacity. Total funding is about \$400 million over three years.¹³⁹ The FCC also has provided funds for the establishment of statewide telemedicine networks and is reviewing options for expediting approval of towers and other needed infrastructure.

Continued federal support for expanding broadband access will be critical for telemedicine to realize its full potential. A future goal should be the development of a nationwide telemedicine network that provides connections between existing networks. Such a network could play a vital role in expanding the reach of health care services, improving collaboration among providers of various specialties, strengthening public health systems, and increasing opportunities for medical training and emergency response.

2. Improve and align reimbursement approaches across payers to encourage greater use of telemedicine across rural settings.

Reimbursement policies for telemedicine, including professional fees and costs of technology adoption, continue to evolve as practitioners, purchasers and consumers test and expand their uses of the technology. Starting in the mid-1990s, the U.S. government began funding telemedical pilots through grant programs in rural areas. Medicare then began covering some telemedicine services, with commercial payers following suit.

Today, private insurers, employers, Medicaid and Medicare all pay for some forms of telemedicine, through payment to physicians located remotely for interactive consultations. The remote monitoring of patients with chronic conditions is more limited.

TRICARE, the Department of Defense's health care program for military personnel, their families and retirees is an innovator in the use of telemedicine. It covers telemedicine in the form of consultations, office or other outpatient visits, individual behavioral health consults, psychiatric diagnostic examinations and pharmacologic management. Payment for most of these services is treated the same as it would be for face-to-face visits.

Medicare reimburses for telemedicine services provided to beneficiaries only in rural areas and for certain services, and restricts the use of store-and-forward services in most states. The program provides reimbursement for remote imaging such as teleradiology; remote monitoring, such as cardiac and pacemaker monitoring; non-face-to-face services conducted through video clips or store-and-forward communication; home health care services; and consultations provided by skilled nursing facilities.^{140, 141} When submitting claims for telemedicine in Medicare, physicians must report the use of interactive audio and/or video telecommunications systems. The non-metropolitan facility where the patient is located is also eligible for a "facility fee" from Medicare. This fee is intended to help offset the costs of investing in and maintaining telemedical technology.

Reimbursement for telemedicine by Medicaid and commercial insurers is subject to greater variation. Nearly half of Medicaid programs provide reimbursement for some remote health monitoring applications and many cover store-and-forward services.¹⁴² Some states have enacted legislation requiring that health plans cover telemedicine.¹⁴³

Private payer reimbursement to providers for telemedicine is increasingly at levels similar to that for face-to-face consults. The financial uncertainty around telemedicine, however, makes providers hesitant to invest in the technology and develop their own telemedicine capabilities.¹⁴⁴ Variation across payers and states has introduced new complexities.¹⁴⁵

Over time, reimbursement approaches should be improved and aligned across payers and broadened to more applications with proven potential to improve health care delivery. Private payers are increasingly covering more mature applications of telemedicine, helping to move adoption beyond the pilot stage. They should continue to innovate in this area and develop model approaches. Medicare statutory restrictions for telemedicine services should be eased or waived, particularly to encourage the use of telemedicine in new payment models, such as accountable care organizations. But rather than viewing telemedicine as just another fee-for-service reimbursement category, the increasing move away from fee-for-service reimbursement models towards more bundled payments linked to outcomes should over time also help incentivize telemedicine's adoption as an enabling platform for improved performance.

3. Encourage physicians to incorporate telemedicine into their practice.

Many physicians remain uncomfortable with telemedicine.¹⁴⁶ The technology requires a shift in the practice of medicine. While telemedicine has the potential to benefit physicians and their patients, education and support are needed to ease the transition for many providers. As with electronic health record adoption, the adoption of telemedicine will also require structural changes in many practices: staff composition, work schedules and record keeping are all likely to evolve in practices that use telemedicine extensively.¹⁴⁷ Health plans, employers and public purchasers of care can all encourage providers in their networks to use telemedicine by educating them about its ability to serve patients better by combining telemedicine encounters with face-to-face care. Demonstrations of the technology and its capabilities tailored to physicians in small practices may also help. To encourage specialists in urban areas to participate in telemedicine referrals, similar approaches should be deployed.

4. Use telemedicine to build primary care capacity in rural areas.

Telemedicine builds capacity in rural areas by making it easier for primary care physicians to connect with and monitor their patients; allowing nurse practitioners and physician assistants to practice in more areas while still being advised by physicians; and increasing the availability of specialists. Rural areas without ease of access to specialists use telemedicine to provide care without the need for transporting patients from small hospitals or physician offices to urban centers. Through video conferencing, physicians located in urban hubs can visit with, treat and prescribe medications for patients in distant rural locations. New telemedicine systems can capture radiology images and eliminate the need for local film processing and reading. Telemedicine makes mobile care units more functional and versatile. Health plans and employers can collaborate with providers to deploy telemedicine in ways that enhance primary care needs in local areas. Ensuring that there are clinical partners to connect to is crucial to the success of this technology in expanding primary care capacity.

Box 6.2; OptumHealth's Connected Care Delivery of Telehealth Technology and Services

Connected Care delivers telehealth services in low-access rural and urban areas using a combination of advanced telecommunications technologies, health care delivery expertise and scalable operations. Through the provision of telemedicine equipment and operational assistance, Connected Care enables communication among existing medical communities, providing the technology and professional support necessary to implement telemedicine. This includes everything from equipment, software and support services, to coordinating scheduling systems, training, facility design and reimbursement analysis. All equipment — video gear, stethoscopes, etc. — is telemetry-enabled.

Connected Care improves access to care by reducing travel time to see specialty providers and making it easier to provide follow-up care in a local setting. It serves rural populations in collaboration with local providers and remote specialists, including Critical Access Hospitals, Rural Health Clinics and larger hospital systems.

Primary care capacity can also be increased by using telemedicine to support continuing medical education in rural areas and heighten the appeal of practicing medicine in rural and remote areas. Using telemedical technology, health care professionals in remote locations can observe rounds at a medical center hundreds of miles away, attend medical education seminars, and participate in continuing education courses. Connecting these individuals to a professional community is particularly important in rural areas where physicians may feel disconnected from their peers and the larger medical community. The University of Colorado is tackling this issue through a telehealth initiative that allows nurses to participate in complex medical courses not offered in their local communities.¹⁴⁸ Providers and communities should integrate this new technology in their recruitment efforts.

5. Increase access choices for rural beneficiaries.

Employers and other purchasers can provide greater choices for rural residents in how they communicate with health care professionals by making available telemedicine applications, such as video consultations, online care and patient kiosks. Telemedicine broadens the scope of care and types of provider networks available to rural residents and makes it more convenient to access services. Telephonic and web-based primary care referral programs can be used to direct patients to appropriate care.

Box 6.3; Online Care Telemedicine From OptumHealth's NowClinic

OptumHealth's NowClinic is a form of online care, a specific type of telemedicine that uses the Internet to provide consumers with real-time access to primary care physicians and specialists licensed within their state. Online care physicians use their clinical judgment to determine the course of care, refer patients as needed, or direct patients to in-person care. The NowClinic also enables conferencing between patients and multiple physicians, allowing for real-time referrals.

6. Raise patient comfort levels with telemedicine technology and encourage its use in rural care models.

Patients who are not accustomed to technology may resist using telemedicine devices. However, given the general advancement in society's overall comfort with technology over the past decade, combined with the convenience of gaining access to services remotely, we may in the future see more patients select this mode of care delivery. Providers can encourage patients to use telemedicine tools, such as remote monitoring, as part of their care. These tools are especially helpful to rural residents with chronic illness who need to track this information to stay healthy, and can lead to greater engagement by patients in the management of their own health.

7. Update regulations associated with technologies and professionals.

Regulations related to medical personnel are evolving with telemedicine technology. Telemedicine providers can work over wide geographic areas, often across state lines, but challenges remain. Practitioners serving several states need to be licensed in each, which can be expensive and time-consuming. Practitioners may also be forced to meet a variety of individual state requirements. For example, they may be required to pay hefty licensure fees and take additional oral and written examinations. Licensing requirements may also differ by facility (i.e., hospitals versus rural health clinics). Currently, many states do not offer interstate licensure for physicians and nurses practicing telemedicine and telehealth. In the past, hospitals receiving telemedicine services were required to review and validate each remote-site provider's credentials, even though that provider might already be credentialed at his or her home facility. CMS has since eliminated this requirement for Medicare and Medicaid programs; hospitals are now allowed to rely on credentialing information from the distant site.¹⁴⁹

Regulation of equipment or use of that equipment can also impede deployment. Medical practice acts in some states contain additional regulatory barriers that limit physicians' ability to use new telemedicine technologies. Modeled after traditional practice patterns, these acts often exclude the practices and techniques made possible by telemedical technology. Federal regulation governs telemedicine equipment as well. The Food and Drug Administration (FDA) is charged with regulating certain equipment used in telemedicine. The FDA typically approves an entire telemedicine system (hardware, software and medical peripherals), rather than a single piece of telemedical device. If one piece is changed (highly likely given the importance of rapidly-changing technology in the telemedicine field) the whole system then requires recertification, which is costly and time consuming. The FDA has recently begun to grant approval for telemedicine system software (which can run on PC, tablet or Smartphone) as a medical device system, alleviating the need for whole-system testing and approval requirements.

Easing regulatory approaches can help broaden deployment of telemedicine, and state and federal regulators should continue to evaluate the impact of regulation in this area. The U.S. Department of Health and Human Services Office for the Advancement of Telehealth in the Health Resources and Services Administration is focused on reducing regulatory barriers to telemedicine, supporting the establishment of telehealth resource centers and sponsoring demonstration projects, including projects targeted at rural and frontier communities. The Department's guidance will be important as the technology and its applications evolve.

8. Improve care coordination and patient safety in rural areas.

Providers should consider adopting telemedicine to aide in efforts to improve patient safety and care coordination. Telemedicine can improve health system efficiency by connecting professionals to each other and to pertinent data (medical records, data from remote monitoring systems, and images). It can also enable greater follow-up with patients post-surgery. Remote patient monitoring in ICUs can improve patient safety and reduce the need for patient transfers. Data transfers from ambulances to hospitals can improve the speed and effectiveness of emergency care. The federal government should encourage adoption of telemedicine in new payment reform models, such as the patient-centered medical home and accountable care organizations, as discussed in Chapter 7.

Chapter 7: New Models for High-Performing Rural Provider Networks

Challenges in Developing Affordable and High-Performing Rural Provider Networks

People living in rural areas have diverse health care needs, which high-quality provider networks can help support. There are, however, a number of challenges in constructing robust and affordable provider networks in rural areas.

Limited numbers of physicians and small enrollee populations. As discussed in Chapter 2, rural physicians are more likely to operate in small or solo practices. As a result, it can be difficult for health plans to form provider networks in rural areas.^{150, 151} Contracting with rural providers requires heavy investment by health plans in administrative overhead.¹⁵² Consequently, innovative products and services may be slower to evolve, particularly if they require up-front investments, and if the rural market does not include health plans with the research and development capabilities and other resources needed. The limited availability of primary care physicians in rural areas exacerbates the challenge, and state scope-of-practice laws can limit the use of non-physician providers to fill that network gap. Employers sometimes also require certain physicians or hospitals to be in their network.

Public policies governing network development. Restrictive network requirements and mandates, including restrictions on the use of alternate providers or technologies, as well as geographic-specific limitations, can also introduce significant barriers to establishing high-performing networks. As the state health insurance exchanges are established under the Patient Protection and Affordable Care Act (PPACA), greater numbers of insured individuals in rural areas may make it easier to engage providers in networks. On the other hand, an influx of newly insured individuals could strain existing limited provider capacity, as discussed in Chapter 4. New challenges may also arise as the federal government and states make determinations about network adequacy for plans offering coverage in state exchanges and for new Medicaid enrollees, if those requirements are not aligned with the realities of rural health care provision.¹⁵³

Low payment rates in public programs. Medicare's payment rates for physicians tend to be lower in rural areas, reflecting lower input costs for staff and office space in those areas. Medicaid's payment rates for physicians are also relatively low. A MedPAC study found that the average rate paid to physicians in rural areas by private health plans was 30 percent higher than rates in fee-for-service Medicare (as compared to 1 percent higher in large metropolitan areas).¹⁵⁴ Low payment rates have historically constrained provider participation in Medicaid and made it difficult for private plans to offer Medicare enrollees alternatives to uncoordinated care in the fee-for-service program.¹⁵⁵ Although there has been success in improving options for rural Medicare beneficiaries since 2003, Medicare Advantage (MA) plans remain more common in urban markets due to the greater competition among providers for both patients and insurer contracts, compared to rural areas.¹⁵⁶ In 2008, for example, only 43 percent of rural beneficiaries had access to a coordinated care MA plan in their local area (as opposed to a regional plan).¹⁵⁷ Other types of plans, so-called private fee-for-service (PFFS) plans, enrolled Medicare beneficiaries without having to form provider networks. The PFFS plans became a popular choice in some rural areas for a short period of time, but those plans have recently declined in popularity, the result of new network

requirements.¹⁵⁸ Forthcoming changes to rural MA funding will mean lower availability of these options for rural seniors, in part because of lower average payments and because the new formula links payments to industry-wide quality rankings, while quality rankings have historically been lower in rural areas.¹⁵⁹

Limited competition among providers. One small hospital and a single physician practice may be the only sources of care in a rural community. Specialty providers, such as teaching or children’s hospitals, may also serve as the only source of treatment for certain conditions in a rural region. In this situation, “must-have” providers inherently assume greater market power — which studies have linked to higher payment rates.¹⁶⁰ In some instances, providers with dominance in a market can simply refuse to contract with certain health plans, leaving residents with limited options for obtaining a health plan that includes the dominant local provider. In an analysis of our commercial claims data, UnitedHealthcare found that in 70 percent of health service areas with both rural and urban hospitals, rural hospital unit prices were higher than those at urban facilities, in some cases substantially; in about half of those markets, the unit price differential was greater than 25 percent.¹⁶¹ Even in areas where more competition exists, hospitals that are part of larger systems can use that leverage to obtain higher prices in those rural markets.

Difficulty in measuring quality and deploying programs to improve the delivery system. Smaller and rural hospitals in remote areas may face greater challenges in reducing rates of readmission and hospital-acquired infections, owing in part to the fixed costs of implementing initiatives to address those problems. Moreover, certain initiatives might be more difficult to apply in rural areas. For example, the condition-specific readmissions rates used to measure quality for most Medicare hospitals may not be as appropriate for low-volume rural hospitals compared to integrated urban-based delivery systems. (Studies of readmission rates, for example, tend to exclude data on Critical Access Hospital, or CAH, discharges.) Rural hospitals also tend to transfer patients to other facilities during their illness episode, complicating the measurement and attribution of readmission rates. In some areas, limited access to post-acute services and care transition programs may also impede strategies to reduce readmissions in rural areas and subject rural hospitals to penalties. Cost-based reimbursement can make the use of financial incentives more difficult.¹⁶² A lower rate of adoption of electronic medical records also represents a barrier, and limited options for post-acute care in some rural areas can complicate efforts to bundle payments.¹⁶³ (Although as noted in Chapter 2, however, rural areas as a whole would appear to have an ample supply of home health agencies and skilled nursing facilities.)

Incentives to participate in voluntary quality reporting programs, such as Medicare’s voluntary physician quality initiative, may not be sufficient to attract participation. Practices with electronic medical records, patient registries and data collection systems are more likely to participate in those programs; however, rural physician offices may lack those capabilities and the staffing necessary to handle program administration requirements. Although the evidence base continues to evolve on how best to adapt quality programs to rural physician practice patterns, there is recognition of the need to ensure that these programs reflect the attributes of rural providers (such as small practice size), employ evidence-based measures that are relevant to rural physician clinical settings, and reflect the experience that rural patients have accessing providers.¹⁶⁴ Overall, there is a need to enhance the data collection and quality improvement capacities in rural areas.

Approaches to Providing High-Performance Providers in Public Programs

State governments. States have taken a variety of steps to improve access to coordinated care in rural regions, but will be further pressed by the forthcoming expansion of Medicaid coverage and the creation of new insurance exchanges. Because states have a long history both as insurance market regulators and purchasers of health care for Medicaid and state employee health benefits, they have often found ways to improve options for rural enrollees in those programs. To ensure access to care and options for coverage, states have developed various approaches to encourage provider participation and induce plans to serve new markets. States have also developed flexible approaches to network adequacy requirements, based on distance, travel time and community provider needs.

In particular, states have learned through experience that providing access to poor residents in rural areas requires multiple strategies. Through provider outreach, Medicaid plans have often been successful in contracting with health centers and rural health clinics (RHCs) that serve large Medicaid populations (described in Chapter 2). Community outreach has also allowed Medicaid managed care plans to form networks that include non-traditional providers, allowing their Medicaid enrollees to access services from those providers. Financial incentives and flexible reimbursement policies have also helped bring managed care to rural areas. Paying a higher share of the FFS percentage for enrollees in rural counties, including a monthly additional fee for rural residents; eliminating geographic adjustments that otherwise would provide lower payment; and adopting special capitation rates designated for services in rural areas are all strategies that have been deployed to help health plans organize networks of providers better on behalf of rural enrollees. States have also provided incentives for plans to cover rural populations; many allow plans to provide coverage in urban markets if they venture into rural markets. Although some states have used PCCM programs to improve delivery of Medicaid fee-for-service care in rural areas, better care coordination for rural Medicaid enrollees continues to be a challenge without broader use of capitated managed care. Medicaid capitated managed care plans have helped states to bring additional resources to rural areas with their greater flexibility to pay needed providers and their ability to deploy care management programs (as described in the UnitedHealth Center for Health Reform and Modernization's *Working Paper 3: Coverage for Consumers, Savings for States*).

Federal government. As discussed in Chapter 2, the Medicare program has taken steps to address the financial challenges facing rural hospitals with special payment adjustments for certain small and low-volume hospitals. While cost-based reimbursement provides much needed support, this payment mechanism also creates incentives that do not encourage efficient delivery of care. For example, although cost-based reimbursement to CAHs offers an alternative to prospective payment for rural areas, it can also create incentives for those facilities to admit and keep patients locally at small, low-volume hospitals in order to receive higher Medicare reimbursement. When a CAH increases its expenditures per patient, Medicare payments increase alongside those expenditures.¹⁶⁵ (These hospitals combined are paid about 25 percent more on average for inpatient and outpatient services than if they were paid through the prospective payment system that governs other Medicare hospitals.¹⁶⁶) Further, hospital, sub-acute providers and clinic systems all are funded through different federal Medicare silos under different rules. Such arrangements complicate efforts to coordinate care, and encourage the delivery of services that may provide limited value for patients.

PPACA contains initiatives designed to improve the quality and efficiency of health care by modifying Medicare's payment methods and providing financial incentives to providers to improve the delivery of care. Incentives take the form of rewards to hospitals for providing high-value care and penalties for

sub-standard care (including payment reductions for readmissions and hospital-acquired infections). To the extent that hospitals receive cost-based reimbursement, however, they are currently excluded from incentive programs designed to foster improved hospital performance (and they also are exempt from Medicare payment reductions affecting other hospitals reimbursed through the inpatient prospective payment system). CMS is developing demonstration projects for CAHs and other small hospitals to explore ways to adapt those programs to their specific circumstances.

Other programs enacted in the recent health reform legislation would allow for physicians and hospitals to share savings from appropriate reductions in the cost of care, such as bundling of payments for episodes of care and forming accountable care organizations (ACOs). While there are no explicit barriers to rural participation, rural providers may face additional challenges, including minimum population requirements. Recently issued proposed rulemaking on ACOs includes several measures designed to facilitate participation by rural providers, including allowing rural ACOs to more easily access shared savings than urban ACOs by eliminating a minimum threshold that ACOs must meet to begin sharing in savings. All ACOs would have financial incentives to incorporate Federally Qualified Health Centers (FQHCs) and RHCs into their organizations. The proposed program also adopts a more flexible approach to antitrust policy related to rural providers and ACOs.

Policy Options and Health Plan Initiatives to Improve Care in Rural Areas

Looking to the future, policymakers have several options they could consider to encourage the development of high-performance provider networks in rural areas, and health plans and other organizations can take several steps to complement those efforts. Key policy concepts worth pursuing include:

1. Maintain flexible requirements for provider networks.

As discussed above, state and federal regulators should allow appropriate flexibility in meeting requirements for provider networks. States that restrict the use of non-physician providers should examine the experiences of states with fewer restrictions and should consider relaxing their limitations. In Chapter 6, we showed how emerging options for telemedicine can provide broader access to providers for rural residents, even though the providers may not be located in rural communities. These capabilities should be increasingly factored into the definition of adequate networks. A model for how states might proceed already exists in the Medicare drug benefit, where policymakers recognized differences in appropriate requirements between pharmacies in rural and urban areas, and allowed for greater flexibility.

Flexibility on network requirements for primary care will be important as states seek to ensure access for their Medicaid population and state employees, and as they implement PPACA coverage expansions scheduled for 2014. In addition to ensuring that non-physician practitioners can contribute to meeting those requirements, examples of flexibility that may be particularly helpful in rural areas include allowing emergency rooms to share coverage to meet 24-hour adequacy requirements or allowing health plans to rely, at least in part, on 24-hour nurse advice lines. Mobile clinic alternatives (discussed in Chapter 5) can also provide needed high-quality care within a broader network of providers, but this approach requires flexibility on the part of states so that clinics can supplement existing, but sparse, rural infrastructure. On any of those initiatives, engagement with local providers to implement the use of optimal approaches will be important.

2. Design health insurance exchange and insurance market rules to increase options for rural residents.

A particular issue that will affect options for rural residents is how states determine markets for coverage — that is, whether there will be one statewide market that all participating plans must serve or instead there will be flexibility in creating benefit packages and networks unique to a geographic region, reflecting local or regional market conditions. States should allow flexibility for health plans by allowing them to design benefits and networks that fit the specific needs of the area being served. Depending on how states establish service areas for geographic rating purposes, rural areas could experience greater premium pressure given limited negotiating power with providers.¹⁶⁷ The requirements regarding minimum actuarial values of plans offered in the exchanges are likely to increase underlying costs more in rural areas than in urban ones, with new subsidies helping to offset them.¹⁶⁸ States can help keep premiums for exchange plans affordable in a number of ways — for example, by effectively implementing annual open enrollment periods.

3. Employ targeted incentives and strategies to increase provider participation in network-based coordinated care.

Public programs can use payment incentives to encourage provider participation in plan networks used by state residents. State initiatives, such as reimbursing for an appropriate range of telemedicine services and increasing facility payments would encourage participation, but may be difficult to advance in light of tight state budgets. However, targeted incentives need not involve rate increases. For example, Georgia’s Medicaid program addressed this access and provider participation issue by setting a reimbursement rate below the state’s fee-for-service rate for hospitals if those hospitals and Medicaid health plans with whom they negotiate fail to come to an agreement after several attempts. States can also encourage use of shared savings or partial capitation models to encourage greater provider participation in their managed care programs. States that seek to use rural participation as a condition of participation in urban Medicaid programs can however ultimately limit the spread of coordinated care in both urban and rural areas if barriers to serving rural areas prove too stringent.

4. Improve Medicare fee-for-service programs to better serve rural populations.

Although a growing share of Medicare beneficiaries choose to enroll in coordinated care plans, many are likely to remain in traditional fee-for-service Medicare. Policymakers may want to consider having fee-for-service programs managed by an administrative services organization (ASO) or a care management organization in order to improve care for rural beneficiaries. This approach — which is described more fully in the UnitedHealth Center for Health Reform and Modernization’s *Working Paper 4: U.S. Deficit Reduction — The Medicare and Medicaid Modernization Opportunity* — would mirror the approach used by large self-insured employers and can be scaled to rural areas. ASOs, or a similar care management entity, could effectively leverage voluntary PPO networks, medical management tools, clinical advocacy and best practices on a more integrated basis, overlaid on the traditional Medicare fee-for-service “chassis.” In areas with a limited number of providers, investment in the capacity of those providers to manage population health could also be considered. Such an entity could also improve the way specialty care is delivered to rural Medicare beneficiaries in urban settings by helping to facilitate urban referral relationships and necessary local follow-up care to prevent readmissions. Additionally, care and services provided to rural Medicare beneficiaries to manage chronic conditions could be incorporated into this model.

5. Develop quality measurement programs for rural providers.

As noted above, a barrier to developing high-value networks in rural areas is the need to improve data collection and quality improvement capacity. This may be an area where public-private collaboration could help, bringing together data from dispersed sources in order to generate analyses that reflect the range of experiences in rural areas and that have the statistical power to yield meaningful results. Performance measures more specific to rural medical care might include triage, stabilization and transfer to urban facilities, and account for the limited scope of services at rural hospitals. The development of decision-support tools, practice guidelines and protocols for care specific to rural areas could improve the quality of care, as well as enable new options for the primary care workforce, such as making greater use of non-physician providers (as discussed in Chapter 5). However, rather than allowing measurement obstacles to prevent progress on improving the quality of care in rural areas, policymakers and researchers should focus on addressing the measurement challenges involved and, at a minimum, use currently available data for rural providers to determine what lessons can be drawn.

6. Engage rural providers in payment reform and other initiatives to encourage high-value care.

As payment innovation proceeds, programs and performance measurement will need to be adapted to the scale, density, practice culture and access issues particular to rural areas if new models are to take root there. For example, for rural ACOs to succeed despite lower patient volumes and limited economies of scale, they will need additional support for establishing electronic health records and conducting patient education. Health centers and clinics serving rural communities should be part of new payment models tested in those areas. New rural provider models will need to improve on the provision of preventive health services (e.g., education, counseling), focus on public health, and provide clinicians with reminders about evidence-based guidelines at the point of care.¹⁶⁹

Box 7.1; Yuma Primary Care Medical Homes

UnitedHealthcare initiated a patient-centered medical home project in 2009 to reduce utilization and improve outcomes in rural Yuma County, Arizona. At that time, emergency room and inpatient utilization at the Yuma Regional Medical Center, the sole hospital in the county, was the highest in the state. Physician productivity was below the national average (physicians saw 11.7 patients per day compared to a national benchmark of 25). Patients who used care most intensively were obtaining primary care services from the emergency room rather than from clinic-based physicians. The Arizona Physicians IPA (APIPA) engaged two of the largest medical practices in the area, as well as the Yuma Regional Medical Center, in a patient-centered medical home program. The three participating facilities adopted clinical practices that coordinated care and used electronic health records. Ten months after the launch of the initiative, notable reductions in utilization have been achieved:

- Medicare admissions declined by 23 percent and days per 1,000 declined by 31 percent.
- Medicaid admissions declined 13 percent and days per 1,000 declined by 11 percent.

More broadly, preparing for new payment reform models requires thoughtful implementation of scheduling systems, adoption of the appropriate technologies and a workforce trained to work in teams and effectively coordinate care — just as in urban and suburban areas. For example, successful approaches to ACO organization that overcome the challenges of coordinating care across physician practices and other facilities could help to develop “virtual” provider networks in rural areas. Approaches designed for rural areas could include incentives for efficient use of hospital beds and deployment of chronic care teams and home telemedicine. Exemptions discussed above may reflect additional challenges that rural hospitals face, but they also raise the risk that rural hospitals will fall behind their urban counterparts in the provision of high-quality care.

7. Adopt innovative network models to link rural patients with specialist care.

By developing provider networks that are adaptive to a range of rural health care needs, health plans can also increase access to specialist services in ways that are more efficient than traditional models. Promising approaches involve bringing providers to patients through the network; others involve helping to bring patients to high-quality providers. Health plans can use network approaches to bring certain kinds of providers, such as radiology services, pharmacies, dentists and behavioral health specialists, to rural areas on a periodic basis by including, for example, scheduling requirements in contracts. Health plans could help to make investments in new capacity, such as mobile vans/clinics, and incorporate these resources into their network as needed or as permitted under state and federal laws.

Health plans can also use network solutions to help primary care physicians and their patients manage referrals for patients with cancer, heart disease and stroke and guide them to Centers of Excellence for services. Concessionary arrangements, such as payment for lodging costs for travelling families of patients can strengthen this pathway, as can assistance with transportation costs. More broadly, health plans can step up their efforts to provide helpful information to enrollees about their treatment options and the quality of the providers available to them, and provide feedback to hospitals about their performance.

8. Engage non-traditional providers in care networks.

Engaging non-traditional providers, as Medicaid managed care organizations currently do, can help improve the ability of networks to serve rural residents. Non-traditional providers include, for example, service coordinators from the community who facilitate coordination across the rural health care delivery system. Service coordinators provide face-to-face contact and serve as a liaison between the patient and his or her physician.

Box 7.2; UnitedHealth Group and New Mexico CoLTS (Coordination of Long Term Services)

In New Mexico's Medicaid managed care program, our UnitedHealthcare Community & State and Evercare programs rely on service coordinators to provide health care coordination and management for members with complex care needs in rural areas. Service coordinators work closely with members, their family, caregivers and physicians to ensure access to primary, acute and long-term care services. Many service coordinators live in the local community and are familiar with the cultural landscape of New Mexico. Travel can be a significant challenge for the chronically ill in the state, with harsh weather conditions, unpaved roads, long distances and limited cell phone service impeding the ability of rural residents to access care. CoLTS eliminates these barriers by hiring service coordinators to travel to the homes of members for regular assessments and follow-ups. In meetings with patients, service coordinators share educational materials with members, help manage medications, notify members of the services and support for which they may be eligible and evaluate ongoing health care needs. Regular check-ups and post-hospital discharge visits reduce the likelihood of visiting the emergency room and help ensure continuity of care. Social supports may include housing, ramps for wheelchairs, heating and coal supply, transportation to various medical appointments, food assistance and clothing.

9. Deploy new insurance benefit designs and products to serve rural residents.

Networks designed to serve rural areas that also bring additional capabilities, such as disease management or targeted plan offerings that are adaptive to specific needs of rural communities, can help expand rural choice of providers and bring health and wellness programs more rapidly into rural areas. Benefit plans that provide rewards and incentives for consumers to use local high-quality physicians and non-physician providers and choose specialists and hospitals based on performance metrics can lead to better care and more informed options, as well.

Chapter 8: Conclusions

The next few years will be times of considerable stress on rural health care, but also times of great opportunity.

As this working paper has shown, the challenge is that rural communities are already having to respond to higher burdens of chronic disease, while dealing with workforce pressures and an aging clinic infrastructure. Come 2014, the recently legislated national coverage expansions will add millions more rural Americans to Medicaid and government-subsidized insurance. There is, therefore, an urgent need to mobilize effort and creativity so as to ensure that these newly covered populations, alongside all other rural Americans, are actually able to get the care they need.

The good news is that across the country there are already impressive examples of innovative new care models providing high-quality care, tailored to the distinctive needs of their local community. In practical terms, this working paper has argued that such solutions will likely need to involve a wide range of practical and complementary approaches.

These include: new incentives for rural primary care physicians, including making use of reformed payment models such as primary care medical homes; a bigger role for nurse practitioners and other rural health professionals; greater provider collaboration across rural areas and with urban health care systems; innovative models using mobile health clinics; faster rural uptake of electronic health records and telemedicine; designing insurance market regulation and Medicaid and exchange network adequacy rules for the needs of rural areas; and greater engagement by rural consumers in improving their health. These are just some of the elements of a roadmap towards a 21st-century rural health care system.

In short, the challenge for all involved in rural America is now to build on this track record of innovation and self-reliance, so as to ensure that all Americans — wherever they live — can live their lives to healthiest and fullest extent possible.

Summary of Selected Solutions

New Models for Modernizing Rural Health Care and Potential Initiatives, by Stakeholder			
	Care Delivery	Telemedicine Technology	High-Performance Provider Networks
How Models Improve Rural Health Care	Improve primary care, access to specialty care and health with strategic approaches to care delivery that use different providers and technology.	Broader use of telemedicine consultations between patients and providers, remote monitoring and mobile health could expand primary care capacity, improve access to specialists, increase patient engagement in their health, and improve patient safety.	Support diverse health care needs of rural residents with more appropriate and coordinated care, and facilitate improvements in delivery system performance.
State and Federal Policymakers	<ul style="list-style-type: none"> • Ease state scope-of-practice restrictions and pursue interstate licensure, credentialing and accreditation models for non-physician providers (nurse practitioners/physician assistants). • Adopt flexible approaches to mobile infrastructure regulation; encourage free care and use of volunteers. • Coordinate funding streams to effectively use resources. • Deploy managed long-term care models to increase care coordination for the rural aged. 	<ul style="list-style-type: none"> • Enable interstate licensure and credentialing for telemedicine health professionals; reduce barriers to telemedicine equipment licensure. • Align and improve reimbursement in public programs with best practices from private payers; encourage pilot programs, and incorporate telemedicine into delivery reform models that link bundled payments to outcomes. • Continue federal support for broadband, invest in nationwide telemedicine network. 	<ul style="list-style-type: none"> • Maintain flexible requirements for health plans meeting requirements for Medicaid and commercial provider networks; ensure a wide range of options in state health insurance exchanges. • Employ targeted incentives to increase provider participation. • Improve Medicare fee-for-service options to serve rural seniors better. • Develop quality and performance measurement programs specific to rural providers. • Engage providers in initiatives to encourage high-value care.
Health Plans and Purchasers of Care	<ul style="list-style-type: none"> • Encourage primary care medical homes and enable use of “circuit physicians” and mobile health clinics for screenings, dental and pediatric care; facilitate appropriate follow-up. • Provide analytics, risk management capabilities and incentives to foster greater clinical collaboration among rural and urban providers. • Deploy and scale wellness programs, using worksite clinics and alliances with third sector, non-traditional partners. 	<ul style="list-style-type: none"> • Deploy telemedicine to connect patients to providers: encourage video consultations and use clinical kiosks. • Improve, align and streamline reimbursement approaches and policies to encourage provider participation. • Implement online care management and wellness programs to facilitate patient engagement. • Encourage use of telemedicine among providers in networks. 	<ul style="list-style-type: none"> • Develop innovative network models to link rural residents with specialty care, such as Centers of Excellence. • Engage non-traditional providers in networks to provide needed services in rural communities. • Innovate to offer new benefit designs for rural residents. • Provide capabilities to aid the development of regional networks of providers.
Health Care Providers	<ul style="list-style-type: none"> • Increase the availability of primary care using multi-disciplinary teams; enable with guidelines and protocols. • Employ health information technology and electronic health records to coordinate care and link up with other providers. • Improve clinical collaboration among rural and urban networks. • Collaborate with health plans on mobile infrastructure for primary and specialty care. • Identify new applications for underused local facilities. 	<ul style="list-style-type: none"> • Expand primary care and specialty capacity in rural areas by encouraging adoption of telemedicine in care settings; include telemedicine in new models of care. • Focus on ways to use to provide needed behavioral health services. • Use telehealth to advance medical education and to increase access to the larger medical community. • Improve patient safety through tele-monitoring. • Encourage patients to engage in efforts to improve their health using online care and mobile health. 	<ul style="list-style-type: none"> • Develop systems to measure and evaluate quality performance. • Deploy and engage pilot ideas to improve quality of care. • Collaborate with health plans in the development of networks of providers that serve rural patients along the care continuum and also in urban areas. • Share resources and expertise across communities, regions, and states.

Appendices

Appendix 1: Definitions of Rural Areas, Shortage Areas, and Medicare Rural Provider Types

How Are Rural Areas Defined?

Several government agencies have developed methods for identifying and estimating what portion of America is rural. Determination of what constitutes a ‘rural’ area and how many people live in rural areas depends on the unit of measurement used — metropolitan versus non-metropolitan areas, counties, census tracts, zip codes — and characteristics of those areas, such as population density, population size, proximity to a defined urban area, degree of urban development and commuting relationships to other areas. There are, therefore, many ways to define what areas are rural and how many people live in those areas. Using a broad definition of a rural area, such as a county, may mask urban parts within those areas. Conversely, a small area, such as a zip code could be designated rural, but may be in close proximity to an urban area and might be more appropriately designated as urban. The following definitions of rural are used by different government agencies for research, funding, and other purposes:

- **The U.S. Census Bureau.** The definition of rural and urban areas by the U.S. Census Bureau accounts for population density, extent of urban development, and adjacent territories and relies on census tracts as its unit of measurement. The Census identifies two types of urban areas — urbanized areas (50,000 or more people) and urban clusters (between 2,500 and 50,000 people). Rural areas consist of all territory, population, and housing units located outside of those areas.¹⁷⁰
- **Office of Management and Budget (OMB).** Generally, for the purposes of economic aid formulas in a range of public programs, OMB distinguishes between rural and urban areas using county-based metropolitan and non-metropolitan classifications. Each county is assigned a metropolitan, micropolitan or non-core (rural) designation. Metropolitan counties may have a fraction of area that is truly urban, while rural counties may include urban places. Due to differences in definition, some people the U.S. Census would classify as urban actually live in non-metropolitan counties.¹⁷¹
- **Economic Research Service of the U.S. Department of Agriculture (USDA).** USDA employs three different metrics to measure the extent to which parts of the country are rural.
 - **Urban Influence Codes (UICs).** This is a county-based measure based on the population size of cities or towns within a county. UICs are classified in three ways and have 12 different categories, depending on population size and whether they are adjacent to large or small metropolitan areas. Metropolitan are large cities, micropolitan have 10,000 to 50,000 people, and non-core, which typically represent rural areas, are divided into seven groups by their adjacency to metro and micropolitan areas, and whether or not they have their own hub of at least 2,500 residents.
 - **Rural-Urban Continuum Codes (RUCC).** This classification system also uses a county-based measure, and classifies counties by their population and proximity to urban areas. Urban, or metropolitan counties, are assigned different codes based on their population count. Non-metropolitan counties are assigned codes based on population size and whether they are adjacent to a metropolitan area. The first three RUCC codes are categorized as metropolitan areas, with a range in population from 20,000 to more than a million. The remaining six codes are classified as non-metro counties, and are differentiated by adjacency to a metro area and population size.

- **Rural-Urban Commuting Areas (RUCA)**. This classification system is a relatively new method for identifying rural areas. In addition to counties, RUCA codes use U.S. census tracts as their basis for estimating whether areas are rural. RUCA codes take into consideration commuting measures, degree of urbanization, and population density.¹⁷² RUCA codes are separated into metropolitan areas (codes 1 – 3), micropolitan areas (codes 4 – 6), small towns (codes 7 – 9), and rural areas (code 10). Within each code are sub-codes that account for proximity to an urban area or urban cluster, and commuting patterns.¹⁷³
- **Centers for Medicare & Medicaid Services (CMS)**. In setting payment rates in the Medicare program that differ by urban and rural geographies CMS relies on OMB-defined metropolitan statistical area measures (with modifications for some counties). For some services, like ambulance, zip code measures of urban and rural are used.

For the purposes of this report, we use RUCC codes in our analysis of rural demographics and health care capacity. In our empirical research on rural versus urban quality, we use CMS zip code definitions. Research we refer to throughout the report may use zip code, county or census tract approaches.

Health Professional Shortage Areas (HPSAs)

The federal government defines areas as having an inadequate supply of primary care medical professionals if those areas have certain characteristics determined by the Health Resources and Services Administration (HRSA) at the Department of Health and Human Services.¹⁷⁴ HPSA determinations are used in a range of federal support programs (for example, for qualification for certain health professions loan eligibility). Primary care medical professionals include physicians in general or family practice, general internal medicine, pediatrics, obstetrics and gynecology.

HRSA has developed a set of population-to-physician ratios that are used to determine if a geographic area, population group, or facility qualifies as an HPSA. Currently, an area is designated as an HPSA if the population to primary care physician ratio is at least 3,500:1. Areas may also qualify with a ratio between 3,500: 1 and 3,000: 1 if the need for primary care is extraordinarily high and/or physicians are inaccessible. A ratio of 2,000:1 is considered adequate. Areas may also be designated HPSAs if there is evidence of exceptionally high need for primary care or if physicians in nearby areas are over-utilized and inaccessible.¹⁷⁵ Today there are 6,404 Primary Care HPSAs with more than 66 million people living in them. Approximately 65 percent of these are located in non-metropolitan areas.¹⁷⁶ HRSA also develops and assigns Dental HPSA and Mental Health HPSA designations.

Medicare Rural Provider Types

The following types of facilities are eligible for special payment under the Medicare program.

- **Critical Access Hospitals (CAH)**. Medicare provides this designation to certain small rural hospitals (25 inpatient beds or less), which are at least 35 miles from the nearest hospital or 15 miles in areas with difficult roads or terrain. CAHs offer 24-hour emergency care, with Medicare paying for most inpatient and outpatient services on the basis of reasonable cost.
- **Medicare Dependent Hospital (MDH)**. Small hospitals qualifying for payment under this category have a maximum of 100 beds, and must attribute a certain percentage of inpatient days or discharges to Medicare Part A patients during a designated timeframe. Payment rates for inpatient services reflect a blend of federal payment rate and the hospital's historic costs, trended forward.

- **Rural Health Clinic (RHC).** These clinics are located in non-metropolitan areas and in an HPSA-designated provider shortage area. RHCs must also employ at least one nurse practitioner or physician assistant, and have an arrangement with one or more hospitals to provide medically necessary services not available at the clinic. RHCs currently receive cost-based reimbursement for a set of specified physician and non-physician outpatient services, subject to a maximum limit.
- **Rural Referral Center (RRC).** These large facilities are high-volume rural hospitals treating a large number of complex cases, largely due to referrals from other providers. Hospitals may obtain this designation if they have more than 274 beds and if at least half of their Medicare patients are referred to the hospital by other providers. Additionally, a majority (60 percent or more) of Medicare patients served by the hospital must be located at least 25 miles from the hospital. The facilities must also meet certain requirements related to the severity of patient conditions and the number of discharges that occur.
- **Sole Community Hospital.** These small rural hospitals must be located more than 35 miles from other similar hospitals, and must be the primary source of hospital care for a majority of patients in the service area. Hospitals that are only 25 or 15 miles away from other providers may qualify for this status if accessibility at other nearby facilities is restricted due to weather conditions, geography, distance, speed limits, and/or travel time.

Appendix 2: Analyses in This Report — Data and Methodology

A. County-Level Population Health Analysis.

To observe differences in population health across counties and between urban and rural areas, we relied on data on the prevalence of specific health factors and health outcomes using County Health Rankings, a new data set from the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, that compiles survey, vital statistics and other data at the county level. We merged that data with data on population and provider supply, as described above to analyze various population health measures in different types of rural areas. Regional census data allowed us to compare population health among the four regions described above. For the purposes of this analysis, we observed the prevalence of diabetes, physical inactivity, obesity and smoking in rural and urban areas. Sample data was taken from several national surveys and extrapolated to produce county-wide and nation-wide estimates of the prevalence of certain chronic conditions and health behaviors.¹⁷⁷

B. Analysis of Supply of Health Care Providers and Professionals by Urban and Rural Areas.

We used county-level data from the Health Resources and Services Administration (HRSA) Area Resource File (ARF) and Geospatial Data Warehouse to quantify the supply of different types of health care providers and health professionals by county in the U.S. The ARF is a database with more than 6,000 variables for each of the nation's counties. Geographic codes are included, which allow ARF data to be linked to other data sets. Data in the ARF are compiled from multiple sources, including the American Medical Association, the Centers for Medicare & Medicaid Services, and the U.S. Census Bureau.

County-level population data, including age and health insurance status, and regional codes from the U.S. Census Bureau further allowed us to identify population counts by county and region and to merge that information with the ARF health care supply data. Our analysis covered four regions — the East, the Midwest, the South and the West. We used rural designation codes from the Economic Research Service of the U.S. Department of Agriculture (USDA) to identify whether counties were rural or urban. Using nine geographic classification codes called Rural Urban Continuum Codes (RUCC), we further identified four distinct types of areas (one urban and three rural) based on similarities in the distribution of health resources and trends. They are:

- Urban counties are represented by codes 1, 2, and 3; Code 1 counties are very large cities with population greater than one million people. Codes 2 and 3 represent smaller metropolitan counties, with code 3 counties having population less than 250,000.
- Rural counties adjacent to urban areas are codes 4 and 6. While county code 4 areas are considered rural, they nonetheless can have populations greater than 20,000. Code 6 counties are adjacent counties with fewer than 20,000 people.
- Rural regional population centers not bordering larger urban areas are codes 5 and 7. County code 5 includes counties not adjacent to metropolitan areas that have more than 20,000 people. Code 7 counties are similarly non-adjacent, but have between 2,500 and 20,000 people residing in them.
- Geographically remote areas are represented by codes 8 and 9. Those counties include completely rural areas or those with fewer than 2,500 people.

Using the combined data elements described above, we calculated the ratio of primary care physicians, specialists, and non-physician professionals per 100,000 people in each county, and used those ratios as the basis for our discussion of relative health care professional shortages. Other county-level designations from HRSA related to different types of government-defined professional shortage areas also informed our analysis. We also used state-level information on scope of practice laws for non-physician primary care providers (specifically nurse practitioners and physician assistants). We also calculated the supply of certain health care facilities — rural health clinics, community health centers, and hospitals per 100,000 people in all counties. This allowed us to observe the distribution of providers across rural and urban areas, regions, and within the three types of rural areas we identified.

C. Background on Quality Measurement

The UnitedHealthcare Premium Designation program uses all of the relevant measures of care quality that have been endorsed by the National Quality Forum plus additional evidence-based measures that have been developed in conjunction with many medical specialty societies.¹⁷⁸ Those measures currently encompass about 20 medical specialties (including primary care) and reflect recommendations for screenings, diagnostic tests and treatments that are widely accepted by medical professionals as key elements of high-quality care. Examples include the regular testing of glycosylated hemoglobin (HbA1c) levels for all diabetics and prescribing beta blockers for patients who have suffered a heart attack.

For each of their patients, physicians have opportunities to provide care that meets evidence-based practice standards. They are evaluated by comparing the proportion of their patients who receive recommended care during a given time period (one to three years, depending on the measure) to a similar group being cared for by other physicians. The specific metrics that apply depend on the specialty involved, patient demographic characteristics and the type of medical condition. For example, a primary care doctor with diabetic patients will be assessed on whether he conducts appropriate monitoring tests for those patients, while a doctor who specializes in treating diabetics will be evaluated by comparing her delivery of evidence-based care to the performance of other doctors who are treating diabetic patients. Since patients often see multiple physicians, the methodology also incorporates rules for attributing opportunities to physicians, seeking to ensure, for example, that doctors are assessed only on the basis of conditions that are within the scope of practice for their specialty.

Each physician is assessed by comparing his or her performance to the peer group compliance rates for each quality measure. These measures are then aggregated to develop an overall quality score for each physician. In order to receive a quality ‘star’ under the Premium Designation program, a physician’s performance is compared to the 75th percentile of the distribution of all measured physicians with a similar mix of patients and quality rules. This higher-than-average standard was chosen to further support quality improvement. Recognizing that claims data for treating UnitedHealthcare’s patients generally represents a sample of a physician’s overall practice patterns, that comparison is made using a statistical test (specifically, the Chi-square test) to determine whether any observed differences reflect true distinctions in performance or instead are likely to represent more random variations that are outside of the physician’s control. Most physicians who have enough claims data to permit evaluation of their care pass the quality criteria and receive a quality star under this system since they are not statistically significantly different than the 75th percentile benchmark. Note that this may occur even when the absolute compliance rate for the physician is below the 75th percentile.

D. Estimates of Increase in Insured Populations in Rural Areas, and Comparison to County-Level Supply of Primary Care Providers.

To compute eligibility and participation estimates under PPACA in rural areas, we used the Lewin Group’s Health Benefits Simulation Model (HBSM), a microsimulation model that allows analysis of changes in health insurance status of different categories of individuals under different policy scenarios. We first developed state-level estimates of the number of individuals who will be newly eligible for and/or newly enroll in Medicaid under the new Medicaid expansion established in the Patient Protection and Affordable Care Act (PPACA), as well as estimates of those who will enroll in the state health insurance exchanges, and estimates of the number of people who otherwise would have been uninsured. We further estimated the county-level distribution of newly insured people in each state using county-level distributions of the non-elderly population and the uninsured from the U.S. Census. The U.S. Census Small Area Health Insurance Estimates are the source of the county-level uninsured figures.

We combined county-level estimates of the newly insured with our data on supply of health professionals and facilities. This allowed us to identify the urban or rural characteristics of areas, in which we estimate there will be a relatively large increase in the non-elderly insured population. It also allowed us to compare relative county-level provider capacity to percent increases in the non-elderly insured population (see Table A2.1). As stated above, the microsimulation we relied on to estimate coverage under the new health reform legislation produced state level estimates. Distributions of those results across counties contain additional uncertainty, as we based those distributions on current county-level estimates of the uninsured. In particular, because those estimates include many undocumented persons, our county-level distributions of the newly insured in some areas may be weighted too heavily.

Distribution of Rural Residents (in Millions) by County Primary Care Capacity and Estimated Percent Increase in Non-Elderly Insured Population Under PPACA in 2019			
% Increase in Insured Population	PCP Capacity		Total
	Below Median	Above Median	
Below Median			
Midwest	5.3	8.2	13.5
Northeast	1.5	3.3	4.8
South	3.0	2.3	5.3
West	1.4	2.2	3.5
Subtotal	11.2	15.9	27.2
Above Median			
Midwest	1.0	0.9	1.9
Northeast	0.1	0.4	0.5
South	8.7	8.3	17.0
West	1.0	2.7	3.7
Subtotal	10.8	12.3	23.1
Total	22.0	28.2	50.2

Table A2.1; Source: Analysis of the Area Resource File and projections of newly insured under PPACA from The Lewin Group Health Benefits Simulation Model.

Note: Median increase in the non-elderly insured population = 15.8%, median number of primary care physicians per 100,000 is 58.

Appendix 3: Survey of Rural and Urban Consumers and Physicians

UnitedHealth Group commissioned Harris Interactive to survey urban and rural primary care physicians and consumers in May, 2011. Results reported in text and figures are for the nationally representative rural and urban samples, unless regional results are provided.

Primary Care Physician survey. An online survey of 1,006 U.S.-based primary care physicians (PCPs) was carried out between May 13, 2011 and May 19, 2011. Surveyed PCPs included those in family practice, general practice, internal medicine, pediatric medicine, or obstetrics. PCPs were classified as urban, suburban or rural based on the zip code in which their office is located and geographic zip-code designations from the U.S. Census. For purposes of the analysis, urban and suburban PCPs were grouped together as “urban.” Measures for statistical differences in the physician survey were conducted at a 95 percent confidence level.

Urban, suburban and rural PCPs were each weighted separately to accurately reflect their respective populations, based on targets from a 2010 American Medical Association database of physicians. Included in the weighting algorithm were variables, such as gender, years in practice and region of the U.S. These group-level weights were used in analysis of both rural and urban groups.

Consumer survey. The consumer survey involved 2,000 U.S.-based consumers and was conducted between May 13, 2011 and May 22, 2011 over the phone using a sample from Survey Sampling International. Urban, suburban and rural consumers were selected from a sample of the general population and contacted using Random Digit Dialing.¹⁷⁹ Surveyed consumers were 21 years of age or older and were involved in making health care decisions for their household. Using the zip code associated with their household, consumers were classified as rural, urban or suburban, with suburban being combined with urban for the purposes of the analysis. Measures for statistical differences in the consumer survey were conducted at a 95 percent confidence level.

Urban, suburban and rural consumers were weighted separately to be representative of their respective populations, based on targets from the Office of Management and Budget’s Metropolitan Statistical Areas (MSA). Included in the weighting algorithm were variables for education, age, gender, household income, household size and number of phone lines (not mobile/cell) in the household. An adjustment was also made for consumers living without a phone at any point in the last two years. These initial group-level weights were used in the analysis of rural and urban groups. A post weight was later applied to the three groups to ensure proportionate representation within the total sample. This post weight was used for analyses involving the entire sample as well as any combined sub-groups, such as respondents in a given region.

Margin for error in the total population of physicians is plus or minus 3.09 percent. For the total consumer population, the margin for error is plus or minus 2.19 percent. Error margins are larger for sub-populations (3.1 percent for both urban and rural consumers and 4.38 percent and 4.34 percent for urban and rural physicians, respectively).

Appendix 4: State by State Rural Primary Care Capacity Estimates

State	Population (000s) ¹			Primary Care Physicians Per 100,000		All Primary Care Providers (PCPs) Per 100,000 ²		Rural Pop. Affected by PCP Shortages & Coverage Increases, by Impact Level (000s) ³			Scope of Practice Rank (1 = Most Restrictive)	
	Urban	Rural	% Rural	Urban	Rural	Urban	Rural	High	Medium	Low	NPs ⁴	PAs ⁵
AL	3,370	1,340	28%	93	56	136	83	230	860	250	1	2
AK	470	230	33%	98	96	231	211	40	100	90	3	4
AZ	5,930	670	10%	80	56	154	117	60	440	170	3	2
AR	1,750	1,140	39%	94	60	99	66	460	680	–	1	3
CA	36,130	830	2%	97	77	153	161	60	250	520	1	2
CO	4,330	690	14%	98	83	187	154	90	560	40	3	2
CT	3,210	310	9%	131	70	244	149	–	–	310	1	3
DE	700	190	21%	92	72	120	87	–	190	–	1	2
DC	600	–	0%	207	NA	530	NA	NA	NA	NA	3	2
FL	17,360	1,180	6%	92	47	182	108	870	310	–	1	1
GA	8,020	1,810	18%	84	58	145	103	670	940	200	1	1
HI	910	390	30%	128	93	141	104	–	–	390	2	1
ID	1,020	530	34%	73	60	142	105	110	400	20	3	3
IL	11,250	1,660	13%	114	59	171	114	30	960	670	1	2
IN	5,030	1,390	22%	92	53	137	81	10	780	600	1	1
IA	1,710	1,300	43%	99	62	164	110	–	610	690	3	1
KS	1,810	1,010	36%	102	70	222	159	60	380	570	1	2
KY	2,490	1,820	42%	100	63	168	115	590	780	450	2	1
LA	3,350	1,140	25%	102	54	152	79	520	620	–	1	1
ME	770	550	42%	130	107	250	200	–	–	550	3	3
MD	5,400	300	5%	126	69	214	128	30	240	30	3	3
MA	6,560	30	0%	136	90	245	187	–	10	20	1	3
MI	8,140	1,830	18%	113	72	177	129	200	700	930	2	3
MN	3,860	1,410	27%	122	76	189	120	–	270	1,140	1	3
MS	1,310	1,640	56%	85	55	137	98	860	780	–	1	2
MO	4,430	1,560	26%	101	63	155	108	430	650	480	1	1
MT	340	630	65%	98	81	199	170	50	460	120	3	1
NE	1,060	740	41%	116	68	200	127	90	260	390	1	3
NV	2,370	270	10%	76	50	113	86	170	80	20	1	3
NH	820	500	38%	90	139	122	170	–	50	450	3	2
NJ	8,710	–	0%	119	NA	174	NA	NA	NA	NA	2	1
NM	1,340	670	33%	100	73	173	127	230	420	20	3	3
NY	18,000	1,540	8%	140	63	245	151	100	750	690	1	3
NC	6,630	2,750	29%	101	61	177	112	1,000	1,420	330	1	4
ND	320	330	51%	132	69	226	138	50	80	200	2	4
OH	9,330	2,210	19%	111	60	163	87	40	880	1,290	1	1
OK	2,360	1,330	36%	89	57	154	106	730	590	10	2	1
OR	2,990	840	22%	114	80	189	138	90	520	230	3	3
PA	10,620	1,980	16%	118	69	200	129	10	1,070	900	1	2
RI	1,050	–	0%	134	NA	200	NA	NA	NA	NA	3	4
SC	3,490	1,070	23%	91	62	109	73	130	870	70	1	1

State	Population (000s) ¹			Primary Care Physicians Per 100,000		All Primary Care Providers (PCPs) Per 100,000 ²		Rural Pop. Affected by PCP Shortages & Coverage Increases, by Impact Level (000s) ³			Scope of Practice Rank (1 = Most Restrictive)	
	Urban	Rural	% Rural	Urban	Rural	Urban	Rural	High	Medium	Low	NPs ⁴	PAs ⁵
SD	380	430	53%	110	73	198	128	70	170	190	1	2
TN	4,630	1,670	27%	110	55	178	99	400	880	390	2	4
TX	21,790	2,990	12%	81	49	126	82	1,920	1,070	–	1	1
UT	2,480	300	11%	74	52	200	120	40	210	50	3	3
VT	210	410	66%	197	113	243	149	–	10	400	1	2
VA	6,770	1,110	14%	102	63	184	115	120	530	460	1	2
WA	5,850	810	12%	104	71	192	153	–	430	380	3	3
WV	1,010	810	45%	117	77	184	152	170	550	90	2	2
WI	4,130	1,520	27%	108	80	135	101	–	510	1,010	1	3
WY	160	380	70%	93	78	133	109	20	210	150	3	3
All U.S.	256,750	50,240	16%	105	65	173	114	10,790	23,520	15,930		

¹ Urban and rural designations are county-level determinations by U.S. Department of Agriculture using Rural-Urban Continuum Codes

² All primary care providers includes primary care physicians, nurse practitioners, and physician assistants

³ High = counties with above median increase in <65 insured and lowest quartile pcp ratio; medium = other counties with above median <65 insured increase or below median pcp ratio; low = below median increase in insured, above median pcp capacity

⁴ NPs = Nurse practitioners; rankings developed by The Lewin Group and Kaiser Family Foundation 2010 state-level data.

1 = collaboration required to diagnose, treat, prescribe, 2 = collaboration to prescribe, 3 = independent practice.

⁵ PAs = Physician Assistants; rankings developed by The Lewin Group based on analysis requirements for physician co-signing charts, controlled substance prescriptions, PA to physician ratios

NA = Not applicable; states without rural counties.

Appendix 5: County-Level Primary Care Capacity

Primary Care Physicians Per 100,000 People by County, 2008

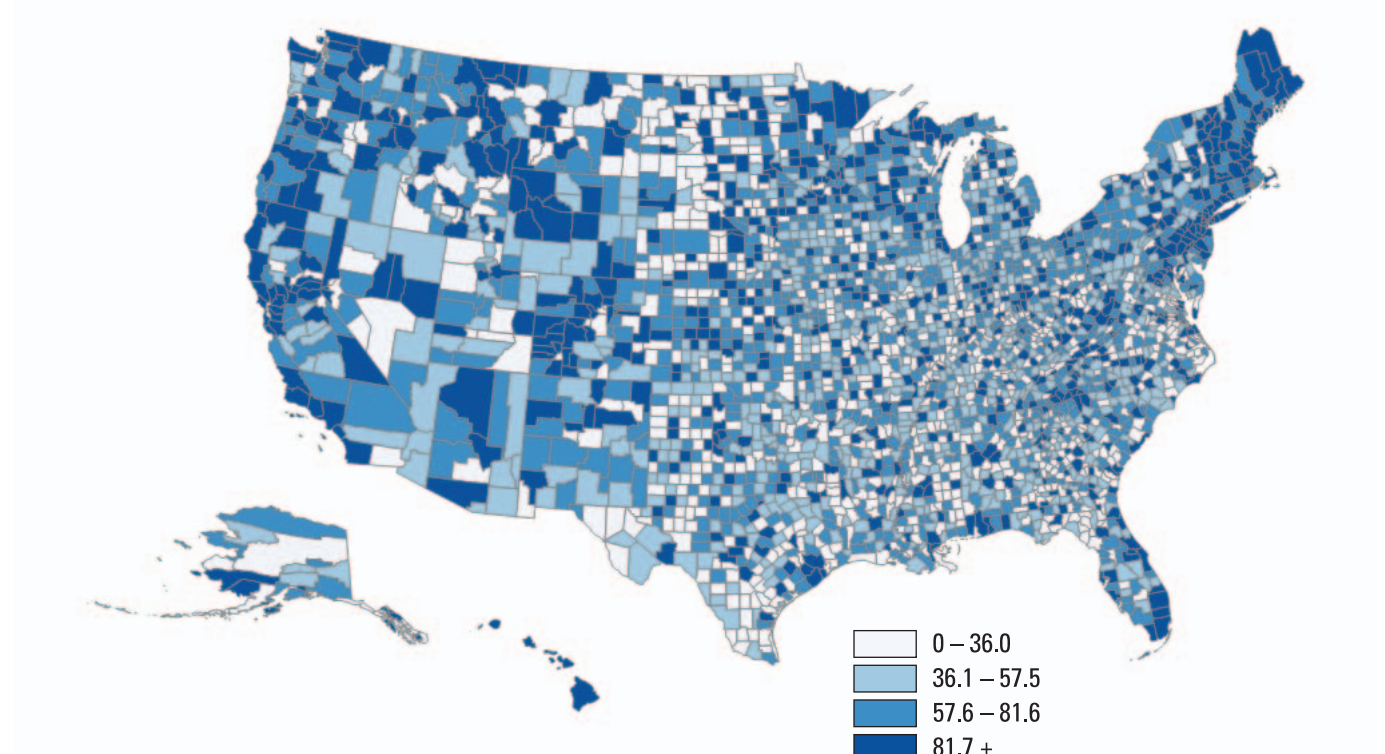


Figure A5.1; Source: UnitedHealth Group Analysis of Area Resource File

References

1. UnitedHealth Group (2011). Analysis of county-level rural-urban codes from the Department of Agriculture and population data from the U.S. Census Bureau (See Appendix 1).
2. UnitedHealth Group (2011). Analysis of the Health Resources and Services Administration (HRSA) Area Resource File (2007 data) and U.S. Census Bureau data (2009 data).
3. DeNavas-Walt C, Proctor BD, and Smith JC, U.S. Census Bureau (2010). Current Population Reports, P60-238, *Income, Poverty, and Health Insurance Coverage in the United States: 2009*, U.S. Government Printing Office, Washington, D.C. and U.S. Department of Agriculture. Amber Waves (November 2004), Low-Skill Jobs: A Shrinking Share of the Rural Economy.
4. U.S. Department of Agriculture (2010). Economic Research Service. Rural Income, Poverty, and Welfare: Poverty Demographics, 2009.
5. U.S. Department of Agriculture (2010). The Two Faces of Rural Population Loss Through Outmigration, 2010
6. U.S. Census Bureau (2005). Interim State Population Projections 2005, Table 7, Change in Total Population for Regions, Divisions and States: 2000 – 2030.
7. Bennett KJ, Olatosi B, Probst JC (2008). Health Disparities: A Rural-Urban Chartbook. Technical report provided to Health Resources and Services Administration/Office of Rural Health Policy.
8. Stensland J and Akamigbo A (2011). Access to Health Care Services by Rural Medicare Beneficiaries. Medicare Payment Advisory Commission. Public hearing, transcript and presentation. While Medicare beneficiaries in some rural areas adjacent to urban ones rated their health status lower than residents of urban areas, others in more isolated communities rated their health the same. When beneficiaries with greater health problems and disabilities were compared, rural beneficiaries were more likely to be healthier than urban counterparts.
9. Bennett KJ, Olatosi B, Probst JC (2008). Health Disparities: A Rural-Urban Chartbook. Technical report provided to Health Resources and Services Administration/Office of Rural Health Policy.
10. Mujib M., et al (2011). Evidence of a ‘Heart Failure Belt’ in the Southeastern United States, *American Journal of Cardiology* 107.6: 935-937. DOI: 10.1016/j.amjcard.2010.11.012.
11. Bennett KJ, Olatosi B, Probst JC (2008). Health Disparities: A Rural-Urban Chartbook. Technical report provided to Health Resources and Services Administration/Office of Rural Health Policy.
12. Liu J, et al (2007). Overweight and Physical Inactivity among Rural Children Aged 10 – 17: A National and State Portrait.
13. Eberhardt MS, Ingram DD, Makuc DM, et al (2001). Urban and Rural Health Chartbook. Health, United States, 2001. Hyattsville, Maryland: National Center for Health Statistics.
14. U.S. Veterans Administration (2010). U.S. Veterans Administration Brochure Series, Rural Health, 2010.
15. Substance Abuse and Mental Health Services Administration (2009). *Results from the 2008 National Survey on Drug Use and Health: National Findings* (Office of Applied Studies, NSDUH Series H-36, HHS Publication No. SMA 09-4434) Rockville, MD.
16. Office of National Drug Control Policy (2010). Methamphetamine Trends in the United States.
17. Because most surveys of meth users have focused on metro areas, the number of rural meth users is currently unknown.
18. U.S. Census Bureau (2010). Current Population Survey: Internal analysis of people by primary source of coverage and metro/non-metro place of residence.
19. AHIP Center for Policy and Research (2010). Low Income & Rural Beneficiaries with Medigap Coverage, 2008.
20. Hackbarth G, Medicare Payment Advisory Commission (2009). Report to Congress: Medicare Payment Policy.
21. Verdier J, Byrd V, and Stone C (2009). Enhanced Primary Care Case Management Programs in Medicaid: Issues and Options for States. Center for Health Care Strategies Resource Paper. In PCCM programs primary care provider is paid a small monthly fee for a limited set of care management activities, including referrals to specialty care from other physicians.
22. UnitedHealth Group analysis of the Health Resources and Service Administration (HRSA) Area Resource File (2007 data) and U.S. Census Bureau Small Area Health Insurance Estimates.

23. U.S. Census Bureau (2010). Current Population Survey: Internal analysis of people by primary source of coverage and metro/non-metro place of residence.
24. Ziller EC, Coburn AF, and Yousefian AE (2006). Out-of-pocket health spending and the rural underinsured, *Health Affairs* 25.6: 1688-1699. DOI: 10.1377/hlthaff.25.6.1688.
25. Berkowitz, B (2004). Rural Public Health Service Delivery: Promising New Directions, *Am J Public Health* 94.10: 1678-1681. PMID: PMC1448514.
26. Woods WM, et al (2006). Recruitment and Retention of a Quality Health Workforce in Rural Areas, National Rural Health Association Issue Paper.
27. In this analysis, primary care physicians include those in general practice, general internal medicine, family medicine, pediatrics, and obstetrics/gynecology.
28. Reschovsky, JD, Staiti, A (2005). Physician Incomes in Rural and Urban America, Issue Brief No. 92. Center for Studying Health Systems Change.
29. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
30. Cunningham R (2010). Tapping the Potential of the Health Care Workforce: Scope-of-Practice and Payment Policies for Advanced Practice Nurses and Physician Assistants. National Health Policy Forum Background Paper No. 76.
31. Machlin S and Kirby J (2009). Health Care in Urban and Rural Areas, Combined Years 2004-2006. Requests for Assistance on Health Initiatives: Update of Content in MEPS Chartbook No. 13. Agency for Health Care Policy and Research.
32. Stensland J and Akamigbo A (2011). Access to Health Care Services by Rural Medicare Beneficiaries. Medicare Payment Advisory Commission. Public hearing, transcript and presentation.
33. Centers for Medicare & Medicaid Services (2010). Rural Health Fact Sheet Series: Rural Health Clinic.
34. Rural health clinics must be located in areas with fewer than 50,000 people that have been designated by the federal government as a Medically Underserved Area, a Health Professions Shortage Area or a Governor Designated Shortage Area, and are staffed at least 50 percent of the time with a non-physician primary care provider.
35. Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care and Hartley, et al (2010). Safety Net Activities of Independent Rural Health Centers. Maine Rural Health Research Center Working Paper No. 44.
36. Alliance for Health Reform (2010). Getting Connected: Can the ACA Improve Access to Care in Rural Communities? October 13, 2010 Briefing.
37. Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care.
38. National Association of Community Health Centers (2010). Community Health Centers and Health Reform: Summary of Key Health Center Provisions.
39. American Recovery and Reinvestment Act: Community Health Centers. Retrieved from: www.hhs.gov/recovery. ARRA provides a mix of grants to upgrade and expand CHCs, expand services to reach more patients, create new access points and job creation, with \$600 million for construction and renovation at CHCs in 30 states.
40. Alliance for Health Reform (2010). Getting Connected: Can the ACA Improve Access to Care in Rural Communities? October 13, 2010 Briefing.
41. U.S. Commission on Civil Rights (2004). Broken Promises: Evaluating the Native American Health Care System.
42. BNA Health Care (2009). Efforts to Regulate Retail Health Clinics Slow, as Industry Finds Its Place, Health Care Policy Report: 17HCPR 599.
43. Rudavsky R, Pollack CE, and Mehrotra A (2009). The Geographic Distribution, Ownership, Prices, and Scope of Practice at Retail Clinics, *Annals of Internal Medicine* 151.5: 315-320.
44. American College of Nurse Practitioners, Retail Health Care Clinics and Nurse Practitioners, retrieved from: <http://www.acnpweb.org/i4a/pages/index.cfm?pageid=3450> April 14, 2011.
45. Shambaugh-Miller MD, Vanosdel N, and Mueller K (2007). Reliance on Independently Owned Pharmacies in Rural America. Rural Policy Research Institute Policy Brief No. 2007-6.

46. UnitedHealth Group (2011). Analysis of the Health Resources and Services Administration (HRSA) Area Resource File (2007 data).
47. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
48. U.S. Department of Health and Human Services and Services Administration Bureau of Health Professions (2000). The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists.
49. Office of Shortage Designation, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health & Human Services (2011). Designated Health Professional Shortage Areas (HPSA) Statistics, April 18, 2011.
50. Doescher MP, et al (2009). The Crisis in Rural Dentistry. Rural Health Research Center Policy Brief.
51. Office of Shortage Designation, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health & Human Services (2011). Designated Health Professional Shortage Areas (HPSA) Statistics, April 18, 2011.
52. Reschovsky J and Staiti A (2005). Access and Quality: Does Rural America Lag Behind, *Health Affairs* 24.4: 1128-1139. DOI: 10.1377/hlthaff.24.4.1128.
53. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
54. National Conference of State Legislatures (2007). Emergency Medical Services in Rural America.
55. Grossman DC, Kim A, Macdonald SC, Klein P, Copass MK, Maier RV (1997). Urban-rural Differences in Pre-hospital Care of Major Trauma, *Journal of Trauma* 42.4:723-729. PMID: 9137264. As cited in: Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care.
56. Branas CC, et al (2005). Access to Trauma Centers in the United States, *JAMA* 293.21: 2626-2333. DOI: 10.1001/jama.294.14.1759-b.
57. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
58. Medicare Payment Advisory Commission (2001). Medicare in Rural America. Report to Congress.
59. UnitedHealth Group (2011). Analysis of the Health Resources and Services Administration (HRSA) Area Resource File (2007 data) and U.S. Census Bureau data (2009 data).
60. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
61. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
62. Medicare Payment Advisory Commission (2010). Critical Access Hospitals Payment System. Report to Congress.
63. Due to a change in Medicare law, beginning in 2006, states are no longer permitted to declare additional hospitals as necessary providers, thereby limiting the number of new CAHs.
64. UnitedHealth Group (2011). Analysis of the Health Resources and Services Administration (HRSA) Area Resource File (2007 data) and HRSA Geospatial Data Warehouse (2010 data).
65. The IHS provides health care to nearly 2 million American Indians and Alaska Natives living on or near reservations and in rural communities in 36 states (primarily in the western U.S. and Alaska).
66. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
67. Holmes GM, et al (2010). A Financial Comparison of Rural Hospitals with Special Medicare Payment Provisions to Urban and Rural Hospitals Paid Under Prospective Payment. North Carolina Rural Health Research & Policy Analysis Center, Final Report 98.
68. UnitedHealth Group (2011). Analysis of the Health Resources and Services Administration (HRSA) Area Resource File (2007 data) and U.S. Census Bureau data (2009 data).

69. Hall MJ, Marsteller J, Owings M (2010). Factors Influencing Rural Residents' Utilization of Urban Hospitals. National Center for Health Statistics National Health Statistics Reports, Number 31. The study used national, all-payer data from the 2003 National Hospital Discharge Survey to determine the proportions of rural hospitalized patients who go to rural and urban hospitals and the factors that influence those decisions.
70. Wakefield DS, et al (2004). Intensive Care Unit Utilization and Inter-hospital Transfers as Potential Indicators of Rural Hospital Quality, *The Journal of Rural Health* 20.4: 394-400. DOI: 10.1111/j.1748-0361.2004.tb00054.x
71. Hall MJ, Marsteller J, Owings M (2010). Factors Influencing Rural Residents' Utilization of Urban Hospitals. National Center for Health Statistics National Health Statistics Reports, Number 31.
72. Agency for Health Research and Quality (2010). Inpatient Stays in Rural Hospitals, 2007, Statistical Brief 85, Analysis based on HCUP 2007 Nationwide Inpatient Sample data, 2010.
73. Agency for Health Research and Quality, Inpatient Stays in Rural Hospitals, 2007. Healthcare Cost and Utilization Project. Statistical Brief No. 85.
74. Reschovsky J and Staiti A (2005). Access and Quality: Does Rural America Lag Behind, *Health Affairs* 24.4: 1128-1139. DOI: 10.1377/hlthaff.24.4.1128.
75. Stensland J and Akamigbo A (2011). Access to Health Care Services by Rural Medicare Beneficiaries. Medicare Payment Advisory Commission. Public hearing, transcript and presentation.
76. Stensland J and Akamigbo A (2011). Access to Health Care Services by Rural Medicare Beneficiaries. Medicare Payment Advisory Commission. Public hearing, transcript and presentation: pp. 15-18.
77. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
78. Wakefield DS, et al (2004). Intensive Care Unit Utilization and Inter-hospital Transfers as Potential Indicators of Rural Hospital Quality, *The Journal of Rural Health* 20.4: 394-400. DOI: 10.1111/j.1748-0361.2004.tb00054.x.
79. Medicare Payment Advisory Commission (2001). Medicare in Rural America. Report to Congress.
80. Lutfiyya MN, et al (2007). A Comparison of Quality of Care Indicators in Urban Acute Care Hospitals and Rural Critical Access Hospitals in the United States. *Int J Qual Health Care* 19 (3): 141-149. DOI: 10.1093/intqhc/mzm010 and Joynt, K E et al (2011) Quality of Care and Patient Outcomes in Critical Access Rural Hospitals, *JAMA*, Vol 306, No 1.
81. Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care.
82. Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care.
83. Klug MG, Knudson A and Muus K (2009). Potentially Preventable Readmissions in Rural Hospitals. Upper Midwest Rural Health Research Center.
84. The Nebraska Center for Rural Health Research Website (n.d.). Medication Safety for Small Rural Hospitals. University of Nebraska Medical Center.
85. Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care.
86. For a more detailed description of the methodology used in the Premium Designation program, see this link ([https://www.unitedhealthcareonline.com/ccmcontent/ProviderII/UHC/en-US/Assets/ProviderStaticFiles/ProviderStaticFilesPdf/Premium Methodology/UnitedHealth_Premium_Detailed_Methodology.pdf](https://www.unitedhealthcareonline.com/ccmcontent/ProviderII/UHC/en-US/Assets/ProviderStaticFiles/ProviderStaticFilesPdf/Premium%20Methodology/UnitedHealth_Premium_Detailed_Methodology.pdf)); that program also analyzes the costs of care provided by doctors, but those assessments of relative efficiency were not included in this report.
87. Researchers at Dartmouth have developed the Hospital Referral Region (HRR) methodology, and HRRs are commonly used in analyses of local health systems and physicians' practice patterns.
88. The number of HRRs with enough data to perform an analysis of the quality of care provided in the area varied by condition, as shown in the table.
89. Doescher MP, Skillman SM, and Rosenblatt RA (2009). The Crisis in Rural Primary Care. University of Washington, Rural Health Research Center Policy Brief.
90. Doescher MP, Skillman SM, and Rosenblatt RA (2009). The Crisis in Rural Primary Care. University of Washington, Rural Health Research Center Policy Brief.
91. Weldon T (2008). Physician Shortages and the Medically Underserved. The Council of State Governments.

92. To access loan repayment funds, graduates need to practice in Health Professional Shortage Areas, as defined by the Health Research and Services Administration.
93. Alliance for Health Reform (2010). Getting Connected: Can the ACA Improve Access to Care in Rural Communities? October 13, 2010 Briefing.
94. J-1 visa waivers allow foreign medical graduates to remain in the country after completing medical school. Under this program, a foreign medical graduate sponsored by the federal or a state government may practice in a federally designated Health Professional Shortage Area or Medically Underserved Area. The number of visa waivers available to any state is limited to 30 per year.
95. Cunningham PJ (2011). State Variation in Primary Care Physician Supply: Implications for Health Reform Medicaid Expansions. Center for Studying Health System Change, Research Brief No. 19.
96. Bailey JM (2010). Health Care Reform, What's in it?: Rural Communities and Rural Medical Care. Center for Rural Affairs Series No. 9.
97. Barnes J and Fannin JM (2009). Reform of Physician Ownership Restrictions and the Cost of Health Care in Rural and Urban Markets. *CHOICES*. Agricultural and Applied Economics Association: 24.4.
98. American Medical Association (2009). Scope of Practice Data Series: Nurse Practitioners. and Ginsburg J. (2009). Nurse Practitioners in Primary Care. American College of Physicians Policy Monograph.
99. Naylor MD and Kurtzman ET (2010). The Role of Nurse Practitioners in Reinventing Primary Care, *Health Affairs* 29.5: 893-899. DOI: 10.1377/hlthaff.2010.0440.
100. Munding MO, et al (2000). Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians, *Journal of the American Medical Association* 283.1: 59-68. DOI:10.1001/jama.283.1.59.
101. A 2010 Institute of Medicine report "The Future of Nursing: Leading Change, Advancing Health" reported that almost 25 years ago, an analysis by the Office of Technology Assessment (OTA) indicated that Nurse Practitioners could safely and effectively provide more than 90 percent of pediatric primary care services and 75 percent of general primary care services, while CRNAs could provide 65 percent of anesthesia services. OTA concluded further that CNMs could be 98 percent as productive as obstetricians in providing maternity services (Office of Technology Assessment, 1986).
102. Hanrahan, NP and Hartley D (2008). Employment of Advanced Practice Nurses to Stem Rural Mental Health Workforce Shortages, *Psychiatr Serv* 59.1: 109 - 111. DOI:10.1176/appi.ps.59.1.109
103. Christian S, Dower C and O'Neil E (2007). Overview of Nurse Practitioner Scopes of Practice in the United States – Discussion. The Center for Health Professions, University of California.
104. Institute of Medicine (2011). The Future of Nursing: Leading Change, Advancing Health. ISBN:10: 0-309-15823-0.
105. Institute of Medicine (2011). The Future of Nursing: Leading Change, Advancing Health. ISBN:10: 0-309-15823-0.
106. Hamory B. (2001). Rural Patient Care Systems. Public Meeting Transcript. Medicare Payment Advisory Commission.
107. Henry, TD, et al (2007). A regional system to provide timely access to percutaneous coronary intervention for ST-elevation myocardial infarction. *Circulation*. 116(7):721-8. PMID: 17673457.
108. Center for Rural Emergency Services and Trauma Website (n.d.). Dartmouth-Hitchcock Medical Center . (Retrieved from: http://www.dhmc.org/webpage.cfm?site_id=2&org_id=916&gsec_id=0&sec_id=0&item_id=46839.)
109. Smith L (2011). Rural Health: If you build it, will specialists come? *Georgia Health News*.
110. Gore M (2009). Holston Medical Group, KPD and Food City Going Paperless, Kingsport Times News.
111. Fowles JB, et al (2008). Performance Measures Using Electronic Health Records: Five Case Studies. Commonwealth Fund.
112. McCarthy D, Mueller K and Klein S (2009). Marshfield Clinic: Health Information Technology Paves the Way for Population Health Management. Commonwealth Fund Case Study.
113. American Hospital Association (2009). American Recovery and Reinvestment Act: Critical Access Hospital Health IT Incentives and Penalties. CAHs engaged in meaningful use of electronic health records (her) are eligible for 101 percent of the Medicare share of certified EHR costs, beginning in FY 2011 as well as some additional payments. The Medicaid health information technology (HIT) incentive can be applied to CAHs if 10 percent or more of the patient volume is comprised of Medicaid beneficiaries.

114. Maxson ER, et al (2010). Beacon Communities Aim to Use Health Information Technology to Transform the Delivery of Care, *Health Affairs* 29.9: 1671-1677. DOI:10.1377/hlthaff.2010.0577.
115. American Hospital Association (2011). The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. AHA Trend Watch.
116. McCullough J, Casey M, and Moscovice I (2009). Health Information Technology Policy and Rural Hospitals. Upper Midwest Rural Health Research Center Policy Brief.
117. Quiram B, et al (2010). Rural Public Health Infrastructure: A Literature Review. In Gamm, L. and Hutchison, L. (eds.) Rural Healthy People 2010: A companion document to Healthy People 2010, Volume 3. The Texas A&M University System Health Science Center, School of Rural Public Health, Southwest Rural Health Research Center.
118. Chen L and Skinner A (2008). Electronic Health Records Adoption: Rural Providers' Decision-Making Process. Rural Policy Research Institute Policy Brief No. 2008-04.
119. Remote Area Medical (RAM) is a publically supported non-profit organization founded by Stan Brock, star of the television series "Wild Kingdom". RAM has been in operation since 1985. For more information, please see the following website: <http://www.ramusa.org/projects/ruralamerica.htm>.
120. National Institute of Standards and Technology, Technology Administration, Department of Commerce (2006). Award Winner: North Mississippi Medical Center, 2006.
121. Norris SL, et al (2002). Task Force on Community Prevention Services. "Increasing Diabetes Self-Management Education in Community Settings", *American Journal of Preventive Medicine*, 22(4s): pp. 39 - 66. PII: S0749-3797(02)00424-5.
122. Kaufman A, et al (2010). Health Extension in New Mexico: An Academic Health Center and the Social Determinants of Disease, *Annals of Family Medicine* 8.1: 73-81. DOI:10.1370/afm.1077. New Mexico's HERO program served as the model for authorization of the Primary Care Extension Program in PPACA.
123. Sarasohn-Kahn J (2011). The Connected Patient: Charting the Vital Signs of Remote Health Monitoring, California Health Care Foundation.
124. American Telemedicine Association (2007). Telehealth and Health Care Provider Shortages. American telemedicine Association Position Statement.
125. Edwards J, et al (2009). Hype Cycle for Telemedicine, Gartner Industry Research. Publication G00169011.
126. Sarasohn-Kahn J (2011). The Connected Patient: Charting the Vital Signs of Remote Health Monitoring, California Health Care Foundation.
127. Edwards J, et al (2009). Hype Cycle for Telemedicine, Gartner Industry Research. Publication G00169011.
128. Jones CA, et al (2009). Health Status and Health Care Access of Farm and Rural Populations. U.S. Department of Agriculture. Economic Information Bulletin 57.
129. Jones CA, et al (2009). Health Status and Health Care Access of Farm and Rural Populations. U.S. Department of Agriculture. Economic Information Bulletin 57.
130. Bergmo TS (2010). Economic Evaluation in Telemedicine – Still Room for Improvement, *J Telemed Telecare* 16.5 (2010): 229-31. DOI: 10.1258/jtt.2010.009008.
131. American Telemedicine Association (2007). Telehealth and Health Care Provider Shortages. American telemedicine Association Position Statement.
132. Young LB, et al (2011). Impact of Telemedicine Intensive Care Unit Coverage on Patient Outcomes: A Systematic Review and Meta-analysis, *Arch Intern Med* 171.6: 498-506. doi:10.1001/archinternmed.2011.61.
133. Agency for Health Research and Quality (2006). Telemedicine for the Medicare Population: Update. AHRQ Publication No. 06-E007.
134. U.S. Veterans Administration (2010). U.S. Veterans Administration Brochure Series, Rural Health, 2010.
135. Berenson RA, Grossman JM and November EA (2009). Does Telemonitoring of Patients – the eICU – Improve Intensive Care? *Health Affairs*, 28.5: w937 – w947. DOI: 10.1377/hlthaff.28.5.w937.
136. McConnochie KM, et al (2009). Acute Illness Care Patterns Change with Use of Telemedicine, *Pediatrics* 123.6: e989 – e995. DOI: 10.1542/peds.2008-2698).

137. U.S. Dept. of Commerce, National Telecommunications & Information Administration (2011). Digital Nation: Expanding Internet Usage. NTIA Research Preview.
138. BroadbandUSA Website (n.d.). Connecting America's Communities. (Retrieved from: <http://www2.ntia.doc.gov/rules>.)
139. Federal Communications Commission Website (n.d.). Rural Healthcare Pilot Program. (Retrieved from: <http://www.fcc.gov/cgb/consumerfacts/RuralHealthProgram.html>)
140. American Telemedicine Association (2010). Federal Support for Telemedicine. ATA Video Presentation and American Telemedicine Association (2008). Medicare Payment of Telemedicine and Telehealth Services.
141. U.S. Government (2008). Public Law 110-275, Medicare Improvements for Patients and Providers Act of 2008.
142. Hall M and Hall P (2009). Telemedicine Reimbursement: A National Scan of Current Policies and Emerging Initiatives. California Telemedicine and eHealth Center.
143. Hall M and Hall P (2009). Telemedicine Reimbursement: A National Scan of Current Policies and Emerging Initiatives. California Telemedicine and eHealth Center.
144. Bashshur RL, Reardon TG and Shannon GW (2000). Telemedicine: A New Health Care Delivery System. *Annual Review of Public Health*. DOI: 10.1146/annurev.publhealth.21.1.613.
145. Hall M and Hall P (2009). Telemedicine Reimbursement: A National Scan of Current Policies and Emerging Initiatives. California Telemedicine and eHealth Center.
146. Chen P (2010). Are Doctors Ready for Virtual Visits? *New York Times*, January 7, 2010.
147. Edwards J, et al (2009). Hype Cycle for Telemedicine, Gartner Industry Research. Publication G00169011.
148. Vuong A (2011). "High-tech Fixes Explored as Colorado Faces Shortages of Health Professionals." *Denver Post*, May 16, 2011.
149. Centers for Medicare and Medicaid Services (2011). Federal Register – Rules and Regulations, Department of Health and Human Services, Centers for Medicare and Medicaid Services, Medicare and Medicaid Programs: Changes Affecting Hospital and Critical Access Hospital Conditions of Participation: Telemedicine Credentialing and Privileging, 76.87.
150. Casey M (1998). Serving Rural Medicare Risk Enrollees: HMO's Decisions, Experiences, and Future Plans, *Health Care Financing Review* 20.1: 73 - 81.
151. Brasure M, Moscovice I and Yawn B (1999). Rural Primary Care Practices and Managed Care Organizations: Relationships and Risk-sharing, Working Paper #28, University of Minnesota Rural Health Research Center.
152. Mueller KJ (2009). Rural Health Insurance and Competitive Markets: Not Always Compatible? *CHOICES* 24.4.
153. PPACA requires that the Secretary of Health and Human Services establish criteria for health plans participating in the exchanges to ensure that health plan networks include a sufficient choice of providers consistent with network adequacy provisions under 2702(c) of the Public Health Service Act and to provide information on the availability of in network and out-of-network services. PPACA also requires the Secretary develop criteria for plan inclusion in their networks of essential community providers "where available" that serve medically underserved and low income communities such as health centers. Health plans are not required, however, to pay those providers rates that exceed the plan's generally applicable payment rates. (Section 1311.)
154. Berenson, Robert (2008). From Politics to Policy: A New Payment Approach to Medicare Advantage, *Health Affairs* 27.2: w156-w164. DOI: 10.1377/hlthaff.27.2.w156.
155. Brasure M, Moscovice I and Yawn B (1999). Rural Primary Care Practices and Managed Care Organizations: Relationships and Risk-sharing, Working Paper #28, University of Minnesota Rural Health Research Center and Call, K (1998). Rural Beneficiaries with Chronic Conditions: Assessing the Risk to Medicare Managed Care. Working Paper No. 28.
156. U.S. Department of Health and Human Services (2009). Payment for Medicare Advantage Plans: Policy Issues and Options. Office of the Assistant Secretary for Planning & Evaluation, p. 10.
157. U.S. Department of Health and Human Services (2009). Payment for Medicare Advantage Plans: Policy Issues and Options. Office of the Assistant Secretary for Planning & Evaluation, p. 10.
158. Mueller KJ (2009). Rural Health Insurance and Competitive Markets: Not Always Compatible? *CHOICES* 24.4. The Medicare Improvement for Patients and Providers Act, passed in 2008, now requires that PFFS plans develop provider networks by 2011. As a result, many of those plans have left markets.

159. UnitedHealth Group (2011). Internal UnitedHealth Group analysis. Rural MA plans under the new Medicare reimbursement regime enacted in PPACA will experience a relatively lower reduction on average in their benchmark rates than urban plans because of historically lower fee-for-service costs. However, their historically lower quality rankings, known as “star ratings” will a) lower the level of rebates permitted by plans to beneficiaries and b) limit their ability to receive bonus payments.
160. Ginsberg PB (2010). Wide Variation in Hospital and Physician Payment Rates Evidence of Provider Market Power, Center for Studying Health System Change, HSC Research Brief No. 16.
161. UnitedHealth Group (2011). Internal analysis of UnitedHealth Group commercial claims (2008 – 2009 data).
162. Towne R, et al (2009). Rural Issues Related to Bundled Payments for Acute Care Episodes. Upper Midwest Rural Health Research Center Policy Brief.
163. Institute of Medicine (2004). Quality through Collaboration: The Future of Rural Health Care.
164. Infante A, Meit M, Hargrave E (2010). The Medicare Physician Quality Reporting Initiative: Implications for Rural Physicians, Rural Health Research and Policy Centers and NORC Walsh Center for Rural Health Analysis.
165. Medicare Payment Advisory Commission (2010) Critical Access Hospitals Payment System. Report to Congress.
166. Congressional Budget Office (2011). Reducing the Deficit: Spending and Revenue Options: p.53. About 10 percent of all Medicare inpatient hospital spending occurs in CAHs.
167. Coburn A, et al (2009). Expanding Health Insurance Coverage for Rural Residents through Health Care Reform. Robert Wood Johnson Foundation.
168. Coburn A, et al (2009). Expanding Health Insurance Coverage for Rural Residents through Health Care Reform. Robert Wood Johnson Foundation.
169. Coleman K and Phillips K (2010). Providing Underserved Patients with Medical Homes: Assessing the Readiness of Safety-Net Health Centers. Commonwealth Fund Issues Brief.
170. U.S. Census Bureau, Geography Division (2010). 2010 Census Urban and Rural Classification and Urban Area Criteria.
171. Medicare Payment Advisory Commission (2001). Medicare in Rural America. Report to Congress.
172. U.S. Department of Agriculture (2005). Rural-Urban Commuting Area Codes. Economic Research Service.
173. WWAMI Rural Health Research Center (n.d.). Rural-Urban Commuting Area Codes. Retrieved from: [http://depts.washington.edu/uwruca/.](http://depts.washington.edu/uwruca/)
174. Primary care medical professionals include physicians in general or family practice, general internal medicine, pediatrics, obstetrics and gynecology.
175. Office of Shortage Designation, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health & Human Services (2011). Designated Health Professional Shortage Areas (HPSA) Statistics, April 18, 2011.
176. Office of Shortage Designation, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health & Human Services (2011). Designated Health Professional Shortage Areas (HPSA) Statistics, April 18, 2011.
177. The 2011 County Health Rankings used data from the following sources (includes years):
- **Diabetes.** Centers for Disease Control (CDC), Small Area Obesity Estimates, 2008.
 - **Obesity.** Behavioral Risk Factors Surveillance System, CDC, 2003 – 2009. Obesity is defined as having a body mass index greater than or equal to 30.
 - **Smoking.** Behavioral Risk Factors Surveillance System, CDC 2003 – 2009. (Includes adults that report having smoked at least 100 cigarettes and who currently smoke.) Survey data on adult smoking was not available for several counties. As a result, 2.8 percent of the U.S. population was not accounted for in our estimates of smoking preference.
 - **Physically Inactive.** National Center for Chronic Disease Prevention & Health Promotion, 2008.
178. For a more detailed description of the methodology used in the Premium Designation program, see this link ([https://www.unitedhealthcareonline.com/ccmcontent/ProviderII/UHC/en-US/Assets/ProviderStaticFiles/ProviderStaticFilesPdf/Premium Methodology/UnitedHealth_Premium_Detailed_Methodology.pdf](https://www.unitedhealthcareonline.com/ccmcontent/ProviderII/UHC/en-US/Assets/ProviderStaticFiles/ProviderStaticFilesPdf/Premium%20Methodology/UnitedHealth_Premium_Detailed_Methodology.pdf)); that program also analyzes the costs of care provided by doctors, but those assessments of relative efficiency were not included in this report.
179. Random Digit Dialing allows for the possibility of reaching unpublished and unlisted residences. As such, a broader cross section of the population can be included in the sampling universe.

About UnitedHealth Group

UnitedHealth Group serves 75 million people, funding and arranging health care on behalf of individuals, employers and governments, in partnership with more than 5,000 hospitals and 650,000 physicians, nurses and other health professionals across the nation. Our core strengths are in care management, health information and technology. As America's most diversified health and well-being company, we are also the nation's largest Medicare health plan — serving one in five seniors nationwide — and the largest Medicaid health plan, supporting underserved communities in 24 states and the District of Columbia.

About the UnitedHealth Center for Health Reform & Modernization

The Center assesses and develops innovative policies and practical solutions for the health care challenges facing the nation. Drawing on UnitedHealth Group's internal expertise and extensive external partnerships, its work program falls into six priority areas:

- Practical cost containment strategies to slow the growth of U.S. health care costs
- Innovative approaches to universal coverage and health benefits, grounded in evidence-based care and consumer engagement
- Reducing health disparities, particularly in underserved communities
- Modernizing the care delivery system, including strengthening primary care
- Payment reform strategies that better support physicians, hospitals and other providers in delivering high quality patient-centered care
- Modernizing Medicare, including chronic disease management

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