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THE HEALTH CARE EXPERIENCES OF RURAL MEDICAID BENEFICIARIES

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Authors

Sharon K. Long
Jennifer King
Teresa A. Coughlin

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Office of Research and Demonstrations
Centers for Medicare & Medicaid Services
7500 Security Boulevard, C-3018-26
Baltimore, Maryland 21244-18509

Project Officer:

Paul Boben

Submitted by:

The Urban Institute
2100 M Street, N.W.
Washington, D.C. 20037

Project Director:

Teresa A. Coughlin

ABSTRACT

Medicaid plays a vital role in rural America, yet little research exists on the health care experiences of low-income rural adults. In large part this is because of data limitations. We use data from the National Survey of America's Families (NSAF) to examine the health care experiences of rural Medicaid beneficiaries compared to other low-income populations within rural areas. We find that rural adults generally experience poorer access to care than their urban counterparts, regardless of income. For high- and low-income adults overall, differences in individual characteristics and provider supply explain some, but not all, of these access disparities. For the Medicaid population, those measures explained *all* the urban-rural access differences. Within rural areas, Medicaid beneficiaries fare better than the low-income uninsured, but report worse access than low-income privately insured adults on most measures. Some, but not all, of the disparities between Medicaid enrollees and privately-insured individuals are explained by differences in individual characteristics and provider supply. We also find that Medicaid managed care may alleviate some access problems in rural areas.

EXECUTIVE SUMMARY

Medicaid plays a vital role in rural America (Scorsone 2003). Medicaid provides health insurance to a substantial minority of rural Americans: About one in six rural residents (16 percent) receive their health insurance through Medicaid (Ziller et al 2003). Moreover, the Medicaid coverage rate in rural areas is about 50 percent higher than that in urban areas. Medicaid is also a major payer of health care services in rural areas, from nursing homes to hospitals to rural health centers (Hurley Crawford and Praeger 2003; Silberman et al. 2003).

While past research has clearly demonstrated that people living in rural areas experience a range of access problems compared to their urban counterparts (Braden and Beauregard 1994; Schur and Franco 1999; Casey Call and Klinger 2001; Zhang, Tao and Irwin 2001), little work has focused explicitly on the health care experiences of rural Medicaid beneficiaries, especially at the national level. Given the many obstacles faced by rural residents in general coupled with the special vulnerabilities of Medicaid beneficiaries, having some understanding about the health care access of this population is important.

The need for information on rural Medicaid beneficiaries is that much more pressing as states shift from fee-for-service (FFS) Medicaid to Medicaid managed care (MMC) in rural areas. While this study does not provide estimates of the impacts of MMC in rural areas, it does provide information on differences in access to care in counties with MMC and those with FFS Medicaid, a first step toward estimating program impacts.

In this study, we use data from three years of the National Survey of America's Families (NSAF) to conduct a detailed look at the health care experiences of rural Medicaid beneficiaries. We focus our study on investigating four questions:

1. Are there urban-rural disparities in access to care for the Medicaid population?

2. What explains urban-rural differences in access to care?

3. How does access to care for Medicaid beneficiaries compare to access for the low-income privately insured and uninsured within rural areas?

4. How does access to care for rural adults in counties with MMC compare to access for those under FFS Medicaid?

In addressing the research questions outlined above, we document the scope of the urban-rural disparities in access to care for all persons using descriptive methods. To understand the factors behind any urban-rural differences in access to care that are observed in the descriptive analysis we estimate multivariate models of access to care

controlling for the individual's predisposition to use health care services, factors that enable or impede use, and the need for health care.

We find that:

- Rural adults tend to fare worse in securing access to care compared to their urban counterparts, regardless of income.

- Individual characteristics and the health care delivery system explain some of the urban-rural access disparities for high-income and low-income adults. For the Medicaid population, those measures explained *all* the access differences between rural and urban beneficiaries.

- Within rural areas, Medicaid beneficiaries fare better than the low-income uninsured, but reported worse access than the low-income privately insured on most measures. Some, but not all, of the disparities between Medicaid and the privately insured in rural areas are explained by differences in individual characteristics and provider supply.

- MMC may alleviate some access problems in rural areas since beneficiaries in rural counties with MMC reported better access than their counterparts in counties with FFS Medicaid and, in rural counties with MMC, access disparities between Medicaid enrollees and privately insured individuals are less than in rural counties with FFS Medicaid.

Our results suggest the rural low-income population is quite diverse and understanding the many access disparities that exist between rural and urban residents, as well as *within* rural populations, is an area that warrants further investigation.

Introduction

Medicaid plays a vital role in rural America (Scorsone 2003). Medicaid provides health insurance to a substantial minority of rural Americans: About one in six rural residents (16 percent) receive their health insurance through Medicaid (Ziller et al 2003). Moreover, the Medicaid coverage rate in rural areas is about 50 percent higher than that in urban areas. Medicaid is also a major payer of health care services in rural areas, from nursing homes to hospitals to rural health centers (Hurley Crawford and Praeger 2003; Silberman et al. 2002).

While past research has clearly demonstrated that people living in rural areas experience a range of access problems compared to their urban counterparts (Braden and Beauregard 1994; Schur and Franco 1999; Casey Call and Klinger 2001; Zhang, Tao and Irwin 2001), very little work has focused explicitly on the health care experiences of rural Medicaid beneficiaries, especially at the national level. Given the many obstacles faced by rural residents in general (e.g., limited provider supply and long travel distances) coupled with the special vulnerabilities of Medicaid beneficiaries (e.g., limited income and poor health status), having some understanding about the health care access of this population is important.

The need for information on rural Medicaid beneficiaries is that much more pressing as states shift from fee-for-service (FFS) Medicaid to managed care in rural areas. Historically, Medicaid managed care (MMC), especially fully capitated programs, has not developed as quickly in rural areas as in urban areas and is still not widely available (Silberman et al. 2002). Nonetheless, a number of states have implemented capitated MMC programs in rural areas, often through Section 1115 or 1915(b) waiver

authority. States with Section 1115 waivers that incorporate rural managed care include: Arizona, Hawaii, Maryland, Minnesota, Missouri, New York, and Oregon. States with 1915(b) waivers that include rural managed care include Colorado, Florida, Michigan, Texas, Virginia, Washington, and Wisconsin.[1]

While some recent literature has been published documenting the obstacles states have faced in designing and implementing rural Medicaid managed care (MMC) programs (Coughlin et al. 2001; Slifkin and Casey 1999; Felt-Lisk et al. 1999), little empirical evidence on the impact of managed care for rural Medicaid beneficiaries is currently available (Hurley et al 2002). Further what work has been done in this area has been state or program specific (Kirkman-Liff 1986; Davis and Potter 1998; Coughlin and Long 2000; Long and Coughlin 2001). To our knowledge, no national study of how MMC affects access to care for program beneficiaries in rural areas has been conducted. While this study does not provide estimates of the impacts of MMC in rural areas, it does provide information on differences in access to care in counties with MMC and those with FFS Medicaid, a first step toward estimating program impacts. The differences in access between the two groups of counties cannot necessarily be attributed to MMC since

[1] Section 1115 of the Social Security Act provides the Secretary of Health and Human Services with broad authority to authorize experimental, pilot, or demonstration projects of policy merit. The authority allows States to provide services which are not otherwise matchable and allows for the expansion of Medicaid eligibility. States can expand managed care to include HMOs, partially capitated systems, primary care case managers, or other variations. Oftentimes savings are achieved from managed care arrangements and used to finance coverage to individuals previously ineligible for Medicaid. Under Section 1915(b) of the Social Security Act, States are permitted to waive statewideness, comparability of services, and freedom of choice. Section 1915(b) waivers are limited in that they apply to existing Medicaid eligible beneficiaries; authority under this waiver cannot be used for eligibility expansions. States may use an 1915(b) waiver to mandatorily enroll beneficiaries into managed care programs, create a "carve-out" delivery system for specialty care, create programs that are not available statewide, provide an enhanced service package via savings from managed care product. Projects under both Section 1115 and Section 1915(b) waivers must be budget neutral (Centers for Medicare and Medicaid Services, 2004).

this analysis does not control for other, potentially confounding, differences between the two county groups.

A principal reason for the dearth of research on the rural Medicaid population is the limited availability of data (Ricketts 1999). National data sets are typically not useful when examining rural populations because of limited sample size (Schur Good et al. 1998). Small sample sizes are particularly problematic when analyzing a subgroup of the rural population such as Medicaid enrollees. In this study, we use data from three years of the National Survey of America's Families (NSAF) to conduct a detailed look at the health care experiences of rural Medicaid beneficiaries. A significant advantage of the NSAF is that it contains an over-sample of the low-income population and thus has a large Medicaid sample compared to most other national surveys. We focus our study on investigating four questions:

1. Are there urban-rural disparities in access to care for the Medicaid population?
2. What explains urban-rural differences in access to care?
3. How does access to care for Medicaid beneficiaries compare to access for the low-income privately insured and uninsured within rural areas?
4. How does access to care for rural adults in counties with MMC compare to access for those under FFS Medicaid?

Methods

Conceptual Model. Our analysis relies on a conceptual model of access to care as a function of an individual's predisposition to use health care services, factors that enable or impede use, and the need for health care (Anderson and Aday 1978). Predisposing factors include demographic and social characteristics (e.g., age and

gender). Enabling/impeding characteristics include individual resources (e.g., income, employment, and insurance status) and the supply of health care providers in the individual's county of residence. An individual's need for health care services is measured by health and disability status.

Data. As noted above, our primary data source is the NSAF. NSAF provides detailed economic, health, and social characteristics for a representative sample of almost 45,000 families in each year of the survey. Three rounds of the survey were conducted: 1997, 1999 and 2002. Of particular relevance to this study, each round of NSAF over-sampled low-income families (defined as having incomes below 200 percent of the federal poverty level (FPL)). By pooling the three rounds of NSAF we are able to obtain relatively large samples for a study of rural Medicaid beneficiaries. For this analysis, we limit our sample to adults aged 19 to 64. We also limit the sample to full-year uninsured and full-year insured individuals since many of our outcome measures (discussed below) refer to health care access and use over the past 12 months. The overall sample size for our study is 129,329 adults, including 2,130 Medicaid beneficiaries in rural areas.

NSAF collected information on a range of topics, including health and health care use, and participation in public programs, such as Medicaid, the State Children's Health Insurance Program (SCHIP), and state health insurance programs. It also collected basic demographic and socioeconomic data. The health-related questions in the survey include perceived health status and access to and use of health services. The access measure used in this study is whether the individual has a usual source of care (other than an emergency room). The health care use measures are based on use in the past year and include whether the individual had a doctor visit, dental visit, emergency room visit, hospital

stay, and, for women, whether they received a Pap smear. We also consider whether the individual reported any unmet need for medical care or surgery over the past year.

The overall response rate for the three rounds of NSAF ranged from 52 to 70 percent. Responses to the interviews are weighted to adjust for the over-sampling of low-income families and other survey design issues, non-response and under-coverage. Because of the complex design of the NSAF, we rely on a jack-knife replication method to obtain accurate variance estimates.

Beyond NSAF, we used the Area Resource File for county-level information on health care provider supply in the individual's county of residence. Our measures of the availability of health care providers in local health care markets include indicators for whether the number of providers per 1,000 people in the county is in the top or bottom 25th percentile nationally. We include measures of the supply of primary care physicians, obstetricians/gynecologists, other specialists and dentists. We also include a similar measure for the number of hospital beds per 1,000 people in the county and a dummy variable for whether the county has a hospital with an emergency room.

Our measure of the MMC status of the individual's county of residence is constructed using information from the Centers for Medicare & Medicaid Services' *National Summary of State Medicaid Managed Care Programs* and *Medicaid Managed Care Enrollment Report, Medicaid Managed Care Summary* (available at www.cms.hhs.gov/medicaid/managedcare). For an individual on Medicaid through the Supplemental Security Income (SSI) program (which provides assistance to individuals with serious disabilities), he or she is coded as residing in a MMC county if the county operates any form of voluntary or mandatory MMC (e.g., capitated HMOs or primary

care case management) for physical health care for its SSI population.[2] Similarly, for an individual on Medicaid though other routes, he or she is coded as residing in a MMC county if the county operates MMC for its Temporary Assistance for Needy Families (TANF) or poverty-related populations. It is important to note that individuals residing in a MMC county may not themselves be enrolled in MMC. Consequently, the comparisons reported here should not be interpreted as comparing MMC enrollees to FFS Medicaid enrollees, rather the comparison focuses on the environment in place in counties with MMC programs and FFS Medicaid programs.

Analytic Approach. In addressing the research questions outlined above, we use both descriptive and multivariate methods. For context, we begin by documenting the scope of the urban-rural disparities in access to care for all persons using descriptive methods. We document urban-rural disparities in access for the overall sample of adults and low-income adults (defined as individuals with family incomes less than 200 percent of the FPL) and higher-income adults (defined as individuals with family incomes at or above 200 percent of the FPL). We then focus on urban-rural differences in access for low-income Medicaid beneficiaries. Again, to provide context, we also examine urban-rural differences in access to care for low-income privately insured persons and uninsured persons.

The second research question focuses on understanding the factors behind any urban-rural differences in access to care that are observed in the descriptive analysis. To analyze this question, we estimate multivariate models of access to care based on the conceptual model presented above. In addition to the explanatory variables included in

[2] Managed care programs that are limited to mental health care services, dental care, family planning, long-term care, or other special services are not included in our measure of MMC.

the conceptual model, the equations also includes dummy variables for the year of the survey (to account for system-wide changes in access to and use of care over the survey period), and a dummy variable indicating whether the adult lives in a rural county, where a rural county is defined as any county not designated a Metropolitan Statistical Area (MSA). The coefficient on the rural dummy variable provides the estimate of the difference in access to care for residents of rural areas as compared to urban areas, after controlling for individual characteristics and/or the local health care market. Table 1 summarizes the full set of explanatory variables included in the regression models. For simplicity, we estimate linear probability models for each outcome.

In presenting our findings, we use the estimated coefficients from the regression equation for each outcome to make two predictions: one assuming every sample member lives in a rural county, and one assuming every sample member lives in an urban county. The difference between these two predicted values provides an estimate of the difference in access to care for individuals in rural and urban areas, controlling for individual characteristics and the local health care market.

We use similar descriptive and multivariate methods in analyzing the third and fourth research questions of the study, which focus on how access to care for Medicaid beneficiaries compares to access for low-income privately insured and uninsured persons in rural areas, and how access to care for Medicaid beneficiaries in rural counties with MMC compares to access for Medicaid beneficiaries in rural counties with FFS Medicaid.

For this part of the analysis, we use the same multivariate methods described above for the rural sample, but replace the rural dummy variable with dummy variables

for insurance status (private insurance or uninsurance versus Medicaid) or whether the individual lives in a rural county with MMC (versus a rural county with FFS Medicaid), as appropriate. For example, in the analysis of differences in access to care between Medicaid beneficiaries and low-income privately-insured and uninsured persons, we estimate models of access to care with two dummy variables included, one indicating whether the individual has private coverage and one indicating whether the individual is uninsured. Medicaid coverage is the omitted category in the regression model. We obtain regression-adjusted estimates of the differences in access for Medicaid beneficiaries versus the privately insured first by predicting access to care assuming everyone is on Medicaid and then predicting access to care assuming everyone is privately insured. The difference between the two predictions provides an estimate of the access gap between Medicaid and the privately insured in rural areas. A similar strategy is used to estimate the access gap between Medicaid beneficiaries and uninsured persons in rural areas, as well as the access gap between Medicaid beneficiaries in MMC counties and FFS Medicaid counties in rural areas.

In these analyses, we take each individual's insurance status and each county's MMC status as given. We do not attempt to adjust for selection into insurance status for individuals or to adjust for a state's selection of MMC or FFS Medicaid for a particular county. To the extent that unmeasured factors affect selection into insurance status, our comparisons between Medicaid and the privately insured and Medicaid and the uninsured will not capture the role that those unmeasured factors play in explaining disparities in access to care. Similarly, if unmeasured characteristics of a rural county affects whether or not the county has MMC or FFS Medicaid (e.g., managed care penetration in the

private insurance market), our comparisons of rural residents in counties with MMC to those with FFS Medicaid will not capture the role that these factors play in access disparities. Accounting for selection into insurance status for individuals and for selection into MMC status for rural counties would be a valuable extension of this study for future research.

Finally, as in other survey-based research, we rely on self-reported measures of access to and use of care, which are subject to errors in reporting as well as deliberate underreporting or overreporting. However, it is unlikely that either errors in reporting, underrerporting or overreporting is systematically related to residence in an urban or rural area, so our urban-rural comparisons are unlikely to be affected.

Findings

Are there urban-rural differences in access to care?

To place our findings for the Medicaid population in context, we first examine urban-rural differences in access to care for all adults, low-income adults and higher-income adults (Table 2). As shown, we find significant urban-rural differences in access to care for all groups of adults. Regardless of income, rural adults are significantly more likely to report having a usual source of care other than the emergency room than are urban adults. For example, 86 percent of all rural adults and 84 percent of all urban adults reported a usual source of care, a difference of 2 percentage points. While this suggests that rural residents have stronger ties to providers than their urban counterparts, rural adults at all income levels fare worse on most other access measures. For example, rural adults are less likely to have had a doctor visit, dental visit or Pap smear (for

women) in the past year than urban adults, although the finding for doctor visits is not statistically significant for low-income adults. Perhaps reflecting their lower levels of use of primary and preventive health care, all rural adults are significantly more likely to have had an emergency room visit in the past year than their urban counterparts. One important difference between the income groups is in disparities in unmet need for care: Low-income rural residents report more unmet need than their urban counterparts, while higher-income adults in rural areas report less. Important to note, however, unmet need for low-income residents in both urban and rural areas is nearly twice that of higher income adults.

Although not a focus of this paper, it is also worth noting that low-income adults have strikingly low rates of preventive care use. Only half of all low-income rural adults had a dental visit in the past year and only half of all low-income rural women had a Pap smear in the past year, well below the goals of Healthy People 2010 (USDHHS 2000).

In Table 3, we look at urban-rural differences in access to care for the low-income population, focusing on Medicaid beneficiaries, the privately insured and the uninsured. We find the urban-rural disparities persist, although the differences vary by insurance status. Not surprisingly since most of the sample has private coverage, rural low-income adults with private insurance are most similar to the overall population (as shown in Table 2) in terms of access to care. They are significantly more likely to have a usual source of care (other than an emergency room), but significantly less likely to have a doctor visit, a dental visit, or a Pap smear in the past year than their urban counterparts. Rural low-income adults with no insurance also fare significantly better than their urban

counterparts in terms of having a usual source of care, but they are more likely to have had an emergency room visit and are less likely to have had a Pap smear.

Among low-income adults on Medicaid, we see fewer urban-rural access disparities than for either low-income uninsured or privately insured individuals. Rural adults on Medicaid are not significantly different from their urban counterparts in terms of having a usual source of care, doctor visits, emergency room visits or unmet need. However, they are less likely to have had a dental visit or a Pap smear in the past year than urban adults on Medicaid, suggesting that securing preventive care may be more difficult for Medicaid beneficiaries in rural areas. However, neither urban nor rural Medicaid beneficiaries appear to be very successful in obtaining preventive care. In both areas, we find low rates of dental visits and Pap smears. At the same time, we observe high rates of emergency room use (44 percent) among adults on Medicaid in both rural and urban areas.

Although sample sizes are small, we also looked at whether urban-rural disparities in access to care for the Medicaid population varied for those on Medicaid because of a disability (as measured by receipt of Supplemental Security Income (SSI)) and those who were enrolled for other reasons. These results are provided in Table 4.

What explains the urban-rural differences in access to care?

The urban-rural disparities in access to care could be caused by differences in the characteristics of the individuals who reside in urban and rural areas, differences in the urban and rural health care markets, and/or structural differences in the way these characteristics *affect* access to care for urban and for rural residents (e.g., providers might be more willing to care for uninsured individuals in a small rural community where

everyone knows each other). In this analysis, we focus on the role of the first two factors—differences in individual characteristics, and differences in the local health care markets.

As has been shown in other research, we find many differences in the characteristics of urban and rural residents (Table 5).[3] Overall, adults in urban and rural areas differ in demographic characteristics, economic circumstances, health insurance coverage, and health and disability status. For example, compared to all urban adults, rural adults are older, more likely to be white and more likely to be United States citizens. Rural adults also have lower levels of educational attainment and, consistent with that, their income and employment levels are also lower. Again, agreeing with past research, rural adults are also less likely to have private insurance and more likely to be uninsured or enrolled in Medicaid than urban adults. Finally, rural adults are more likely to report fair or poor health status or a work limitation than urban adults.

We also find significant differences in the supply of health care providers in urban and rural areas. As has been documented elsewhere (Rosenblatt and Hart 1999, Schur and Franco 1999, National Center for Health Statistics 2001), we find that rural residents have access to many fewer providers in their communities than do their urban counterparts (Table 6). For example, compared to adults in urban counties, rural residents are significantly less likely to live in a county with a high concentration of primary care physicians, specialists, obstetricians/gynecologists, or dentists. Adults in rural areas face wide variation with regards to the concentration of hospital beds in their communities. While rural adults are more likely than urban adults to live in a county

[3] Because of the large sample sizes for the study, even small differences between urban and rural residents are significantly different from zero.

with a high concentration of hospital beds (a finding consistent with past work (National Center for Health Statistics 2001)), they are also more likely to live in a county with a low concentration of hospital beds.

Table 7 presents the regression-adjusted differences in access to care that are generated by multivariate models that control for the characteristics of the populations and health care provider supply in urban and rural areas. The top section of the table presents the simple differences in access between urban and rural areas (akin to what was reported in Table 2). The middle section of the table shows the access disparities that persist after controlling for differences in the individual characteristics of the adults in urban and rural areas. In the bottom section of the table, we present the access differences that persist after adding controls for differences in the supply of local health care providers to the model.

As shown in the table, population characteristics and provider availability account for some, but not all, of the urban-rural disparities in access to care among low-income adults. For example, after controlling for individual characteristics and the local supply of providers, we no longer find significant urban-rural differences in emergency room visits or unmet need for low-income adults. Further, after accounting for differences in individual characteristics, low-income adults in rural areas are significantly less likely to have a doctor visit than urban adults. Nevertheless, after controlling for these factors, we continue to find significant urban-rural differences for the low-income population on several measures of access. Low-income adults in rural areas are more likely to have a usual source of care than urban adults, but they are less likely to have a doctor visit,

dental visit or a Pap smear than their urban counterparts, although the differences are smaller.

By contrast, population characteristics and provider supply explain little of the urban-rural disparities in access for higher-income adults. After controlling for population characteristics and the availability of health care providers, we no longer find significant urban-rural differences in emergency room visits or unmet need for higher-income adults. However, on all other measures of access, accounting for differences in population characteristics and provider supply reduces but does not eliminate the urban-rural disparities for higher-income adults.

Table 8 shows that controlling for the characteristics of individuals and the supply of health care providers in their communities also reduces many of the urban-rural access disparities for subgroups of the low-income population (the privately insured, the uninsured, and Medicaid beneficiaries). Controlling for population and provider differences in urban and rural areas reduces the urban-rural access disparities across all insurance subgroups of the low-income population and eliminates them entirely for the Medicaid population.[4] Only a few urban-rural differences in access to care persist, and only for the privately insured and uninsured. For example, rural adults with private insurance are still less likely to have a doctor visit or a dental visit than their urban counterparts. Uninsured adults in rural areas are still more likely to have a usual source of care than urban adults

[4] Although our sample sizes are large, the smaller sample size for the Medicaid sample implies that our ability to detect small differences will be somewhat less for that population than for the privately insured or the uninsured. For example, at a 10 percent significance level and 80 percent power, the minimum detectable difference between the non-MSA and MSA sample for an outcome that occurs for 50 percent of the non-MSA sample would be 2.0 percentage points for the sample with private insurance and 3.1 percentage points for the Medicaid sample.

In Table 9 we show urban-rural disparities in access to care for those on Medicaid because of a disability and those who were enrolled for other reasons after controlling for individual characteristics and local provider supply. Similar to the overall Medicaid population, for the non-SSI sub-group these factors explain all of the urban-rural disparities. Among disabled Medicaid beneficiaries, those in rural areas are less likely than those in urban areas to have a hospital stay, a difference which was not significant without controlling for individual characteristics and provider supply.

Together, these results suggest that differences in the characteristics of urban and rural individuals and their local health care markets explain all of the urban-rural differences in access to care for the overall Medicaid population. By contrast, for the broader low-income population these factors eliminate some but not all of the urban-rural access differences. Finally, for higher-income adults, individual characteristics and provider supply do little to explain urban-rural disparities in access to care.

How does access to care for Medicaid beneficiaries compare to access for other populations within rural areas?

In Table 10, we present simple differences in access to care for Medicaid beneficiaries and low-income adults with private insurance and the uninsured in rural areas. As shown in the table, Medicaid beneficiaries have much better access to care than the uninsured in rural areas: Medicaid beneficiaries are much more likely to report having a usual source of care and using all of the types of care than are the uninsured. Medicaid beneficiaries are also significantly less likely to report unmet need for care than the uninsured.

In contrast, relative to low-income adults with private insurance in rural areas, Medicaid beneficiaries' access to care is somewhat mixed: Medicaid beneficiaries are

less likely to report having a usual source of care but more likely report having a doctor visit. They are also more likely to have an emergency room visit and a hospital stay and less likely to have a dental visit. Unmet need for care is also higher among Medicaid beneficiaries.

Can those access differences be explained by who enrolls in Medicaid or differences in the local health care markets in rural areas?

The differences in access to care between the Medicaid population and other low-income adults in rural areas could be due to differences in the individuals who enroll in Medicaid versus those in private coverage or uninsured, or differences in the local health care markets that the populations face in rural areas. Table 11 shows that there are many significant differences in the characteristics of Medicaid beneficiaries compared to low-income privately insured and uninsured adults in rural areas. Adults on Medicaid are more likely to be female, more likely to be non-white, and less likely to be married than the adults with private insurance or adults with no insurance. Compared to the other populations in rural areas, Medicaid beneficiaries are also more likely to be in fair or poor health or have a work limitation, report lower levels of income and employment status, and are less likely to own a car. Finally, compared to adults with private insurance, Medicaid beneficiaries have lower levels of education.

Similar to our findings for urban-rural differences in access to care, differences in population characteristics and the supply of providers explain many of the disparities between the Medicaid population and privately insured in rural areas (Table 12). For example, we no longer find significant differences in usual source of care, doctor visits, unmet need, or hospital stays after accounting for these factors. Nevertheless, some disparities persist. Rural adults on Medicaid continue to be significantly more likely to

have an emergency room visit and less likely to have a dental visit than rural adults with private insurance.

In contrast, Table 12 also shows that differences in access between the Medicaid population and uninsured adults in rural areas remain strong after controlling for differences in population characteristics and the supply of local health care providers. We continue to find significant gains in access to care for adults in rural areas on Medicaid relative to uninsured adults across all access measures.

How does access to care for rural Medicaid beneficiaries compare in counties with MMC versus counties with FFS Medicaid?

In Table 13, we show differences in access to care for the rural Medicaid population, comparing individuals in rural counties that are operating MMC to individuals in rural counties that remain under FSS Medicaid. After controlling for differences in population characteristics and the supply of health care providers, we find relatively few differences in access to care for adults in counties with MMC compared to those in counties with FFS Medicaid. Among the differences we do find, both SSI and non-SSI Medicaid beneficiaries in counties with MMC are more likely to have a usual source of care and a doctor visit than their counterparts in FFS counties.

In Table 14, we examine access disparities between Medicaid beneficiaries and the privately insured in rural areas, comparing the two groups within counties with MMC and within counties operating FFS Medicaid. In counties with MMC, Medicaid beneficiaries are more likely to have a doctor visit and a hospital stay than low-income adults with private insurance. However, the are less likely to have a dental visit. In counties with FFS Medicaid, adults on Medicaid are less likely to have a usual source of care and more likely to have an emergency room visit than their counterparts with

private insurance. Medicaid beneficiaries in FFS counties, like those in MMC counties, are significantly less likely to have a dental visit.

Discussion

In this paper we take a national look at health care access and use patterns of adults in rural America, with a special focus on Medicaid beneficiaries and the low-income population.

Comparisons of Rural and Urban Populations. In this part of the study, simple descriptive analysis revealed that, on the whole, rural adults fare worse in securing access to care compared to their urban counterparts, regardless of income. Rural adults are significantly less likely to have a Pap smear or a dental visit in the past year but are more likely to report going to an emergency room, which we interpret as suggesting problems with getting primary care. While both higher and lower income rural residents face significantly greater access problems compared to urban dwellers, the numbers of poor rural adults getting care, especially primary care, is notably low. Only about half reported having a dental visit in the past year. Likewise, only half of rural low-income women had a Pap smear in the past year. This level of use is well below national goals set out by the Healthy People 2010 campaign (USDHHS 2000).

When we examined rural and urban differences for low-income adults by insurance status—privately insured, Medicaid and uninsured--we observed access disparities varied across the groups. Overall, we found limited differences between rural and urban Medicaid beneficiaries, suggesting that program beneficiaries face equally challenging access problems, regardless of where they live. By contrast, for the low-

income privately insured and uninsured we found evidence of more access disparities between rural and urban residents. The major difference for the low-income privately insured was poorer access to primary care for rural residents, compared to urban residents. These differences may reflect the fact that, compared to urban privately insured residents, rural privately insured are more likely to have non-group health insurance, which typically provides fewer benefits than employer-sponsored insurance (Schur and Franco 1999). For the uninsured, differences also centered around access to primary care but was reflected in the significantly higher use of emergency rooms by rural residents, relative to the urban uninsured.

To obtain a sense of what factors may be driving these differences, we examined the roles individual characteristics and the health care delivery system play in explaining access disparities between rural and urban residents. We found that these factors are important in explaining some of the access disparities between rural and urban residents. However, the extent to which they play a role varies by subgroup. For higher-income adults, our measures explained little of the urban-rural access differences, with many of the disparities for this subgroup persisting after controlling for individual and health market characteristics.

By contrast, for lower-income adults overall, we found that our measures of population characteristics and the health care market explained more of the access disparities between urban and rural residents. And, for the Medicaid population the measures eliminated *all* the access differences between rural and urban beneficiaries. For the low-income privately insured and uninsured, the measures explained most but not all of the disparities.

These results suggest that what accounts for rural and urban access differences varies by subgroup. More work needs to be done to understand why many access disparities persisted for higher-income adults and for low-income privately insured and uninsured adults, even after controlling for important personal and health system characteristics. An expansion of the variables included in the model is likely warranted to capture other differences between the urban and rural populations. For example, a better measure of supply of providers based on census tract or more detail on the generosity of insurance coverage could be tested. Further, adding measures that account for different dimensions of health status and of health care access such as attitudes or beliefs toward health care should be tested. It is also possible that the relationship between individual and health market characteristics and access to care differs in urban and rural areas.

Even without such expansions of this analysis, the results do show that how the rural population uses health care varies across subgroups. Moreover, the factors that drive that variation appear to differ by subgroup. To develop sound and effective policies, decision makers should be mindful of the diversity among rural Americans.

Rural Medicaid Beneficiaries and Health Care Access. Although we found limited access disparities between rural and urban Medicaid beneficiaries, we observed strikingly large differences between the rural Medicaid population and the low-income rural uninsured and privately insured. Rural Medicaid beneficiaries fared better than the low-income uninsured, showing the benefits of Medicaid coverage for improving access to care. The picture was mixed when Medicaid beneficiaries were compared to the low-income privately insured. For doctor visits, beneficiaries reported better access whereas

on other measures (usual source of care, dental visit, emergency room use and unmet need) they reported worse access than the low-income privately insured.

In trying to determine what may account for the differences within the rural low-income population, we found that individual characteristics explained much of the access disparities between Medicaid beneficiaries and the privately insured, whereas provider supply explained very little. After controlling for the characteristics of the individuals, access to care under Medicaid was nearly equivalent to that of private insurance.

By contrast, our measures of individual characteristics and provider supply explained virtually none of the many disparities we observed between Medicaid and the uninsured in rural areas. After controlling for both individual characteristics and provider supply, significant differences between rural Medicaid beneficiaries and the uninsured persisted on all access measures. Consistent with the goals of the program, Medicaid provides substantial gains in access to care relative to being uninsured.

Although this study accounts for a range of variables that may influence access and use, it has an important limitation: it does not separate the effects of who enrolls in Medicaid from the effects of Medicaid itself. If the reasons that underlie an individuals' choice to enroll or not enroll in Medicaid also directly affect the individuals' health care access and use, and those reasons are not controlled for in the analysis, then observed differences in access and use between Medicaid and those with private insurance and the uninsured may be due, in part, to unmeasured differences between the individuals who choose Medicaid relative to those choosing private insurance or uninsurance rather than the individual's actual insurance status. This could bias the estimates of the effects of Medicaid compared to private insurance or to being uninsured. Addressing these

selection issues in examining the effects of the Medicaid program is an area for future research.

Medicaid Managed Care in Rural Areas. In our final area of inquiry, we examined whether there were access differences between Medicaid beneficiaries living in rural counties that had FFS Medicaid and those living in counties with MMC. Our results suggest that rural managed care holds some promise for Medicaid beneficiaries. We found that beneficiaries in counties with MMC were significantly more likely to have a usual source of care and to have a doctor visit, compared to beneficiaries living in FFS counties. Although not significant, five percent fewer beneficiaries in MMC counties reported using an emergency room in the past year compare to beneficiaries in FFS counties. All of these results (more beneficiaries reporting a medical home, higher use of primary care and lower use of emergency rooms) are in keeping with the major goals of managed care.

While these findings suggest that rural MMC may help alleviate some access problems, the findings are descriptive and should not be interpreted as providing estimates of the impacts of MMC on beneficiaries. More rigorous evaluation methods are needed to obtain reliable impact estimates that disentangle the effects of MMC from other differences that may exist between the MMC and FFS Medicaid counties.

Conclusions

In this overview of access to health care for the low-income rural population we have attempted to fill an information gap for an important and vulnerable group. Our results suggest the population is quite diverse and understanding the many access

disparities that exist between rural and urban residents, as well as *within* rural populations, is an area that warrants further investigation. Further, our results suggest that as policymakers seek to eliminate disparities in access to care, the low-income rural population is a group that should not be overlooked.

REFERENCES

Andersen R and LA Aday. 1978. "Access to Medical Care in the US: Realized and Potential." *Medical Care*, 16(7): 533-546.

Braden J and K Beauregard. 1994. "Health Status and Access to Care of Rural and Urban Populations." AHCPR Pub. No. 94-0031. National Medical Expenditure Survey Research Findings 18. Rockville MD: Agency for Health Care Policy and Research.

Casey MM, KT Call and JM Klinger. 2001. "Are Rural Residents Less Likely to Obtain Recommended Preventive Healthcare Services?" *American Journal of Preventive Medicine*, 21(3): 182-188.

Centers for Medicare and Medicaid Services. 2004. "State Waiver and Demonstration Services." http://www.cms.hhs.gov/medicaid/waivers/default.asp, accessed September 2004.

Coburn AF, EH Kilbreth, SH Long and MS Marquis. 1998. "Urban-Rural Differences in Employer-Based Health Insurance Coverage of Workers." *Medical Care Research and Review,* 55(4): 484-96.

Coughlin TA and SK Long. 2000. "Effects of Medicaid Managed Care on Adults." *Medical Care,* 38(4): 433-46.

Coughlin TA, SK Long and B Ormond. 2004. "Rural Medicaid Managed Care: The Case of Four States." Report to the Centers for Medicare and Medicaid Services under Contract HHS-500-95-0040.

Davis S and RG Potter. 1998. "Making It Work for the Consumer." In *Remaking Medicaid: Managed Care for the Public Good*, edited by S.M. Davidson and S.A. Somers. San Francisco, CA: Jossey-Bass Inc.

Felt-Lisk S, P Silberman, S Hoag and R Slifkin. 1999. "Medicaid Managed Care in Rural Areas: A Ten-State Follow-Up Study." *Health Affairs,* 18(2): 238-245.

Gamm L, L Hutchinson, G Bellamy et al. 2002. "Rural Health People 2010: Identifying Rural Health Priorities and Models for Practice." *Journal of Rural Health,* 18(1): 9-14.

Gibbs R. 2001. "Rural Labor and Education: Rural Education." www.ers.usda.gov/laborand education/ruraleducation.htm, accessed April 2004.

Hurley RE, H Crawford and S Praeger. 2002. "Medicaid and Rural Health Care." *Journal of Rural Health*, 18(S): 164-175.

Jolliffe D. 2003. "Briefing Room: Rural Income, Poverty and Welfare: Rural Poverty." US Department of Agriculture, Economic Research Services, www.ers.usda.gov/briefing/incomepoverty/welfare.html, accessed, April 15, 2004.

Kandel W. 2002. "Briefing Room: Race and Ethnicity in Rural America: The Demography and Geography of Rural Minorities." US Department of Agriculture, Economic Research Services, www.ers.usda.gov/briefing/raceandethnic/geography.html, accessed April 2004.

Kirkman-Liff B. 1986. "Competition in Health Care and the Rural Poor: An Assessment from Arizona's Competitive Medicaid Experiment." *Journal of Rural Health,* 2(1): 23-38.

Long SK and TA Coughlin. 2001. "Impacts of Medicaid Managed Care on Children." *Health Services Research*, 36(1): 7-23.

Moscovice I, et al. 1998. "Expanding Rural Managed Care: Enrollment Patterns and Prospects." *Health Affairs,* 17(1): 172-179.

National Center for Health Statistics. 2001. *Health, United States, 2001, with Urban and Rural Health Chartbook.* Hyattsville, MD: National Center for Health Statistics.

Ormond BA, S Zuckerman and A Lhila. 2000. "Rural/Urban Differences in Health Care Are Not Uniform Across States." Assessing the New Federalism, Series B, No, B-11. Washington DC: The Urban Institute.

Ricketts RC. 1999. "Epilogue: Rural Health Policy and Data." In *Rural Health in the United States*, edited by RC Ricketts. New York, NY: Oxford University Press.

Ricketts TC, KC Johnson-Webb and RK Randolph. 1999. "Populations and Places in Rural America." In *Rural Health in the United States*, edited by RC Ricketts. New York, NY: Oxford University Press.

Rosenblatt RA and LG Hart. 1999. "Physicians and Rural America." In *Rural Health in the United States*, edited by RC Ricketts. New York, NY: Oxford University Press.

Schur CL and SJ Franco. 1999. "Access to Health Care." In *Rural Health in the United States*, edited by RC Ricketts. New York, NY: Oxford University Press.

Schur CL, CD Good, and ML Berk. 1998. "Barriers to Using National Surveys for Understanding Rural Health Policy Issues." Bethesda MD: Project Hope Walsh Center for Rural Health Analysis.

Scorsone EA. 2003. "The Economics of Rural Health Care and Health Insurance." Presented in Health Insurance Access in Rural America, Kaiser Network.org webcast, October 6.

Silberman P, S Poley, K James and R Slifkin. 2002."Tracking Medicaid Managed Care in Rural Communities: A Fifty-State Follow-Up." *Health Affairs*, 21(4): 255-263.

Slifkin RT, and MM Casey. 1999. "Medicare Managed Care in Rural Areas." In *Rural Health in the United States*, edited by RC Ricketts. New York, NY: Oxford University Press.

United States Department of Health and Human Services. 2000. *Health People 2010.* Second Edition. Washington, DC: US Government Printing Office.

United States Department of Agriculture. 2003. "Rural America At A Glance." www.ers.udsa.gov/abouters.htm, accessed April 2004.

Zhang P, G Tao and KL Irwin. 2000. Use of Preventive Medical Services in the United States: A Comparison Between Rural and Urban Populations." *The Journal of Rural Health,* 16: 349-356.

Ziller EC, AF Coburn, SL Loux , et al. 2003. "Health Insurance Coverage in Rural America Chartbook." Washington DC: The Kaiser Commission on Medicaid and the Uninsured.

Zhang P, Tao G and KL Irwin. 2001. "Utilization of Preventive Medical Services in the United States: A Comparison Between Rural and Urban Populations." *The Journal of Rural Health*, 16: 349-356.

Table 1: Summary of Explanatory Variables Included in the Regression Models

Explanatory Variables	Mean
Individual resides in a rural area	0.21
Age (years)	40.16
Female	0.56
Race/ethnicity	
White non-Hispanic	0.75
Black non-Hispanic	0.11
Other non-Hispanic	0.03
Hispanic	0.11
Is a citizen	0.94
Marital status	
Married	0.61
Divorced/separated/widowed	0.17
Never been married	0.19
Marital status is missing	0.03
Family size	3.22
Has any children	0.60
Education	
Less than high school	0.11
High school diploma/some college	0.62
Bachelors degree or more	0.27
Income	
Less than 100% FPL	0.14
100-200% FPL	0.19
200-400% FPL	0.31
400% FPL or greater	0.36
Work status	
Worked full-time full-year last year	0.50
Other work in last year	0.32
No work in last year	0.18
Works mostly between 6am-6pm	0.62
Insurance status	
Private insurance	0.77
Medicaid/State/SCHIP	0.08
Uninsured	0.15
Health and disability status	
Health status is fair or poor	0.13
Has health limitation	0.14
Delivered baby in last year	0.03
Own car or other vehicle	0.88
Provider supply in individual's county of residence	
Concentration of primary care physicians	
High	0.53
Low	0.05
Concentration of specialists	
High	0.74
Low	0.11
Concentration of OB-GYNs	
High	0.66
Low	0.09
Concentration of dentists	
High	0.65
Low	0.04
Concentration of hospital beds	
High	0.17
Low	0.09
Emergency Department in county	0.95
Sample size	129,330

Note: A county is designated as having a high(low) concentration of providers if the ratio of providers/1000 people in the county is in the top(bottom) 25th percentile nationally.
Source: 1997, 1999, 2002 National Survey of America's Families and Area Resource File

Table 2: Differences in Access to Care in Rural and Urban Areas for All Adults, by Income Level

	All Adults			Low-Income Adults			Higher-Income Adults		
	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference
Usual Source of Care	85.7%	83.7%	2.0 ***	78.4%	72.5%	5.9 ***	89.1%	87.1%	2.0 ***
Doctor Visit	66.2%	71.7%	-5.5 ***	58.5%	60.4%	-1.9	69.7%	75.2%	-5.5 ***
Pap Smear	59.6%	66.3%	-6.7 ***	50.6%	56.0%	-5.4 ***	64.3%	69.9%	-5.6 ***
Dental Visit	64.1%	72.1%	-8.0 ***	49.2%	53.4%	-4.2 ***	70.9%	77.8%	-6.9 ***
ER Visit	22.5%	19.8%	2.7 ***	28.7%	26.2%	2.5 **	19.6%	17.8%	1.8 **
Hospital Stay	2.7%	2.4%	0.3	3.6%	3.4%	0.2	2.3%	2.1%	0.2
Unmet Need for Medical Care	6.9%	6.7%	0.2	10.4%	9.1%	1.3 *	5.3%	5.9%	-0.6 *
Sample size	27,717	101,612		11,249	31,157		16,468	70,455	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 3: Differences in Access to Care in Rural and Urban Areas among Low-Income Adults, by Insurance Status

	Private Insurance			Uninsured			Medicaid		
	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference
Usual Source of Care	88.5%	84.6%	3.9 ***	64.0%	51.6%	12.4 ***	84.6%	84.1%	0.5
Doctor Visit	67.1%	71.7%	-4.6 ***	39.9%	38.3%	1.6	78.5%	76.6%	1.9
Pap Smear	58.2%	62.1%	-3.9 *	36.6%	43.4%	-6.8 ***	57.4%	62.3%	-4.9 *
Dental Visit	62.6%	66.8%	-4.2 ***	35.4%	35.6%	-0.2	45.1%	54.0%	-8.9 ***
ER Visit	24.3%	23.9%	0.4	27.1%	21.3%	5.8 ***	44.2%	44.0%	0.2
Hospital stay	3.1%	3.0%	0.1	2.2%	2.0%	0.2	8.3%	7.5%	0.8
Unmet Need for Medical Care	6.4%	5.9%	0.5	14.9%	13.3%	1.6	10.8%	9.0%	1.8
Sample size	5,473	14,303		3,647	9,836		2,130	7,018	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 4: Differences in Access to Care in Rural and Urban Areas for Subgroups of Medicaid Beneficiaries

	All Medicaid			SSI Medicaid			Non-SSI Medicaid		
	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference
Usual Source of Care	84.6%	84.1%	0.5	88.0%	87.9%	0.1	83.0%	82.8%	0.2
Doctor Visit	78.5%	76.6%	1.9	83.5%	85.5%	-2.0	76.1%	73.6%	2.5
Pap Smear	57.4%	62.3%	-4.9 *	49.7%	47.9%	1.8	61.1%	66.8%	-5.7 **
Dental Visit	45.1%	54.0%	-8.9 ***	40.7%	45.0%	-4.3	47.2%	57.1%	-9.9 ***
ER Visit	44.2%	44.0%	0.2	43.3%	50.0%	-6.7 *	44.6%	42.0%	2.6
Hospital stay	8.3%	7.5%	0.8	7.2%	10.4%	-3.2	8.8%	6.6%	2.2
Unmet Need for Medical Care	10.8%	9.0%	1.8	10.6%	12.4%	-1.8	10.9%	7.9%	3.0 *
Sample size	2,130	7,018		660	1,579		1,470	5,439	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 5: Individual and Family Characteristics of Adults in Rural and Urban Areas

	All Adults		
	Non-MSA	MSA	Difference
Age	40.30	39.80	0.50 ***
Female	0.50	0.51	-0.01
Race/ethnicity			
White non-Hispanic	0.85	0.69	0.16 ***
Black non-Hispanic	0.08	0.12	-0.05 ***
Other non-Hispanic	0.02	0.06	-0.03 ***
Hispanic	0.05	0.13	-0.08 ***
Is a citizen	0.98	0.92	0.06 ***
Marital status			
Married	0.67	0.61	0.06 ***
Divorced/separated/widowed	0.12	0.13	-0.01
Never been married	0.18	0.23	-0.05 ***
Marital status is missing	0.03	0.03	0.00 *
Family size	3.05	3.02	0.03
Has any children	0.46	0.45	0.01 **
Education			
Less than high school	0.16	0.11	0.04 ***
High school diploma/some college	0.68	0.61	0.07 ***
Bachelors degree or more	0.17	0.28	-0.12 ***
Income			
Less than 100% FPL	0.13	0.10	0.04 ***
100-200% FPL	0.18	0.14	0.05 ***
200-400% FPL	0.35	0.31	0.04 ***
400% FPL or greater	0.33	0.46	-0.13 ***
Work status			
Worked full-time full-year last year	0.50	0.53	-0.03 ***
Other work in last year	0.32	0.31	0.02 **
No work in last year	0.18	0.16	0.01 ***
Works mostly between 6am-6pm	0.61	0.63	-0.01 **
Insurance status			
Private insurance	0.76	0.82	-0.06 ***
Medicaid/State/SCHIP	0.06	0.05	0.02 ***
Uninsured	0.18	0.14	0.05 ***
Health and disability status			
Health status is fair or poor	0.14	0.12	0.02 ***
Has health limitation	0.14	0.12	0.02 ***
Delivered baby in last year	0.02	0.02	-0.004 ***
Own car or other vehicle	0.90	0.88	0.02 ***
Sample size	27,717	101,612	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 6: Local Health Care Market Characteristics Faced by Adults in Rural and Urban Areas

Provider Supply in County of Residence	All Adults		
	Non-MSA	MSA	Difference
Concentration of primary care physicians			
High	0.22	0.60	-0.39 ***
Medium	0.63	0.36	0.27 ***
Low	0.15	0.04	0.11 ***
Concentration of specialists			
High	0.26	0.89	-0.63 ***
Medium	0.33	0.09	0.23 ***
Low	0.42	0.02	0.40 ***
Concentration of OB-GYNs			
High	0.29	0.79	-0.49 ***
Medium	0.40	0.20	0.20 ***
Low	0.31	0.02	0.30 ***
Concentration of dentists			
High	0.25	0.71	-0.47 ***
Medium	0.59	0.27	0.33 ***
Low	0.16	0.02	0.14 ***
Concentration of hospital beds			
High	0.23	0.17	0.06 ***
Medium	0.63	0.75	-0.12 ***
Low	0.14	0.08	0.06 ***
Emergency Department in county	0.84	0.97	-0.13 ***

Note: A county is designated as having a high(low) concentration of providers if the ratio of providers/1000 people in the county is in the top(bottom) 25th percentile nationally.
Source: Area Resource File.
* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 7: Regression-Adjusted Differences in Access to Care in Rural and Urban Areas for All Adults, by Income Level

	All Adults			Low-Income Adults			Higher-Income Adults		
	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference
Simple Differences									
Usual Source of Care	85.7%	83.7%	2.0 ***	78.4%	72.5%	5.9 ***	89.1%	87.1%	2.0 ***
Doctor Visit	66.2%	71.7%	-5.5 ***	58.5%	60.4%	-1.9	69.7%	75.2%	-5.5 ***
Pap Smear	59.6%	66.3%	-6.7 ***	50.6%	56.0%	-5.4 ***	64.3%	69.9%	-5.6 ***
Dental Visit	64.1%	72.1%	-8.0 ***	49.2%	53.4%	-4.2 ***	70.9%	77.8%	-6.9 ***
ER Visit	22.5%	19.8%	2.7 ***	28.7%	26.2%	2.5 **	19.6%	17.8%	1.8 **
Hospital stay	2.7%	2.4%	0.3	3.6%	3.4%	0.2	2.3%	2.1%	0.2
Unmet Need for Medical Care	6.9%	6.7%	0.2	10.4%	9.1%	1.3 *	5.3%	5.9%	-0.6 *
Differences Controlling for Individual Characteristics									
Usual Source of Care	87.0%	84.4%	2.6 ***	80.6%	76.1%	4.6 ***	90.1%	88.5%	1.6 ***
Doctor Visit	67.9%	72.3%	-4.4 ***	60.8%	64.6%	-3.8 ***	71.2%	76.2%	-5.0 ***
Pap Smear	60.7%	65.3%	-4.6 ***	53.9%	57.2%	-3.3 **	65.0%	70.2%	-5.2 ***
Dental Visit	66.7%	71.1%	-4.4 ***	51.7%	55.8%	-4.1 ***	73.6%	78.9%	-5.3 ***
ER Visit	22.4%	21.1%	1.3 *	28.9%	28.1%	0.8	19.2%	17.7%	1.5 *
Hospital stay	3.0%	2.9%	0.1	4.1%	4.3%	-0.1	2.5%	2.3%	0.2
Unmet Need for Medical Care	6.5%	7.6%	-1.0 ***	9.5%	10.5%	-1.1	5.1%	6.1%	-1.0 ***
Differences Controlling for Individual Characteristics and the Local Supply of Providers									
Usual Source of Care	87.2%	84.4%	2.9 ***	80.8%	76.0%	4.8 ***	90.4%	88.4%	1.9 ***
Doctor Visit	68.5%	72.1%	-3.6 ***	60.8%	64.6%	-3.8 **	72.2%	75.9%	-3.7 ***
Pap Smear	61.0%	65.1%	-4.1 ***	53.9%	57.2%	-3.3 **	65.6%	69.9%	-4.4 ***
Dental Visit	68.2%	70.8%	-2.6 ***	53.1%	55.5%	-2.4 *	75.4%	78.7%	-3.3 ***
ER Visit	22.1%	21.1%	1.0	28.9%	28.1%	0.9	18.8%	17.8%	1.0
Hospital Stay	2.9%	2.9%	0.0	3.7%	4.4%	-0.6	2.5%	2.2%	0.2
Unmet Need for Medical Care	6.8%	7.5%	-0.7	9.7%	10.4%	-0.7	5.3%	6.1%	-0.8
Sample size	27,717	101,612		11,249	31,157		16,468	70,455	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 8: Regression-Adjusted Differences in Access to Care in Rural and Urban Areas Among Low-Income Adults, by Insurance Status

	Private Insurance			Uninsured			Medicaid		
	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference
Simple Differences									
Usual Source of Care	88.5%	84.6%	3.9 ***	64.0%	51.6%	12.4 ***	84.6%	84.1%	0.5
Doctor Visit	67.1%	71.7%	-4.6 ***	39.9%	38.3%	1.6	78.5%	76.6%	1.9
Pap Smear	58.2%	62.1%	-3.9 *	36.6%	43.4%	-6.8 ***	57.4%	62.3%	-4.9 *
Dental Visit	62.6%	66.8%	-4.2 ***	35.4%	35.6%	-0.2	45.1%	54.0%	-8.9 ***
ER Visit	24.3%	23.9%	0.4	27.1%	21.3%	5.8 ***	44.2%	44.0%	0.2
Hospital stay	3.1%	3.0%	0.1	2.2%	2.0%	0.2	8.3%	7.5%	0.8
Unmet Need for Medical Care	6.4%	5.9%	0.5	14.9%	13.3%	1.6	10.8%	9.0%	1.8
Differences Controlling for Individual Characteristics									
Usual Source of Care	88.1%	86.2%	1.9	64.6%	55.0%	9.6 ***	86.0%	85.1%	1.0
Doctor Visit	67.1%	74.3%	-7.2 ***	40.4%	41.4%	-1.0	77.5%	77.9%	-0.3
Pap Smear	59.2%	63.0%	-3.7 *	39.8%	43.0%	-3.2	60.2%	62.7%	-2.5
Dental Visit	62.9%	68.7%	-5.7 ***	36.4%	37.4%	-1.0	49.9%	54.5%	-4.6 *
ER Visit	25.0%	24.4%	0.6	24.7%	22.8%	1.9	42.8%	44.3%	-1.5
Hospital stay	3.5%	3.7%	-0.2	2.3%	2.3%	-0.1	8.7%	8.3%	0.4
Unmet Need for Medical Care	6.7%	6.6%	0.1	13.4%	16.4%	-3.1 ***	10.0%	10.2%	-0.2
Differences Controlling for Individual Characteristics and the Local Supply of Providers									
Usual Source of Care	88.3%	86.1%	2.1	64.4%	55.0%	9.4 ***	87.0%	84.9%	2.1
Doctor Visit	68.0%	73.9%	-5.9 ***	38.7%	42.0%	-3.2	78.4%	77.6%	0.8
Pap Smear	59.6%	62.7%	-3.1	39.2%	43.1%	-3.9	60.3%	62.8%	-2.5
Dental Visit	63.5%	68.5%	-5.0 ***	37.9%	37.2%	0.7	53.8%	53.7%	0.0
ER Visit	24.9%	24.3%	0.6	24.7%	22.8%	1.9	42.9%	44.2%	-1.3
Hospital Stay	3.2%	3.8%	-0.6	2.2%	2.3%	-0.1	6.6%	9.0%	-2.4
Unmet Need for Medical Care	6.6%	6.6%	0.0	13.7%	16.4%	-2.7	11.3%	9.7%	1.6
Sample size	5,473	14,303		3,647	9,836		2,130	7,018	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 9: Regression-Adjusted Differences in Access to Care in Rural and Urban Areas for Subgroups of Medicaid Beneficiaries

	All Medicaid			SSI			Non-SSI		
	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference	Non-MSA	MSA	Difference
Simple Differences									
Usual Source of Care	84.6%	84.1%	0.5	88.0%	87.9%	0.1	83.0%	82.8%	0.2
Doctor Visit	78.5%	76.6%	1.9	83.5%	85.5%	-2.0	76.1%	73.6%	2.5
Pap Smear	57.4%	62.3%	-4.9 *	49.7%	47.9%	1.8	61.1%	66.8%	-5.7 **
Dental Visit	45.1%	54.0%	-8.9 ***	40.7%	45.0%	-4.3	47.2%	57.1%	-9.9 ***
ER Visit	44.2%	44.0%	0.2	43.3%	50.0%	-6.7 *	44.6%	42.0%	2.6
Hospital stay	8.3%	7.5%	0.8	7.2%	10.4%	-3.2	8.8%	6.6%	2.2
Unmet Need for Medical Care	10.8%	9.0%	1.8	10.6%	12.4%	-1.8	10.9%	7.9%	3.0 *
Differences Controlling for Individual Characteristics									
Usual Source of Care	86.0%	85.1%	1.0	88.6%	87.8%	0.7	85.1%	84.3%	0.8
Doctor Visit	77.5%	77.9%	-0.3	85.1%	85.8%	-0.7	75.0%	75.2%	-0.2
Pap Smear	60.2%	62.7%	-2.5	89.4%	87.4%	2.0	62.0%	67.1%	-5.1 *
Dental Visit	49.9%	54.5%	-4.6 *	44.1%	43.6%	0.5	51.3%	58.0%	-6.7 **
ER Visit	42.8%	44.3%	-1.5	43.4%	52.8%	-9.4 **	43.1%	42.0%	1.1
Hospital stay	8.7%	8.3%	0.4	6.4%	11.5%	-5.1 **	9.8%	7.3%	2.5
Unmet Need for Medical Care	10.0%	10.2%	-0.2	11.7%	13.2%	-1.5	9.7%	9.1%	0.6
Differences Controlling for Individual Characteristics and the Local Supply of Providers									
Usual Source of Care	87.0%	84.9%	2.1	88.6%	87.9%	0.7	86.2%	84.1%	2.1
Doctor Visit	78.4%	77.6%	0.8	86.4%	85.4%	1.0	75.6%	74.9%	0.7
Pap Smear	60.3%	62.8%	-2.5	47.6%	49.8%	-2.2	63.2%	66.8%	-3.6
Dental Visit	53.8%	53.7%	0.0	45.6%	43.3%	2.3	56.0%	57.2%	-1.2
ER Visit	42.9%	44.2%	-1.3	46.6%	51.6%	-5.1	42.0%	42.2%	-0.2
Hospital Stay	6.6%	9.0%	-2.4	4.3%	12.7%	-8.4 **	7.8%	7.8%	0.0
Unmet Need for Medical Care	11.3%	9.7%	1.6	13.6%	12.4%	1.3	10.8%	8.7%	2.2
Sample size	2,130	7,018		660	1,579		1,470	5,439	

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 10: Differences in Access to Care in Rural Areas Among Low-Income Adults, by Insurance Status

	Medicaid	Private Insurance	Uninsured	Difference	
				Medicaid - Private Insurance	Medicaid - Uninsured
Usual Source of Care	84.6%	88.5%	64.0%	-3.9 **	20.6 ***
Doctor Visit	78.5%	67.1%	39.9%	11.4 ***	38.6 ***
Pap Smear	57.4%	58.2%	36.6%	-0.8	20.8 ***
Dental Visit	45.1%	62.6%	35.4%	-17.5 ***	9.7 ***
ER Visit	44.2%	24.3%	27.1%	19.9 ***	17.1 ***
Hospital stay	8.3%	3.1%	2.2%	5.2 ***	6.1 ***
Unmet Need for Medical Care	10.8%	6.4%	14.9%	4.4 ***	-4.1 ***
Sample size	2,130	5,473	3,647		

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 11: Individual and Family Characteristics of Low-Income Adults in Rural Areas, by Insurance Status

	Low-Income Adults				
				Difference	
	Medicaid	Private Insurance	Uninsured	Medicaid - Private Insurance	Medicaid - Uninsured
Demographic					
Age	38.90	39.50	36.00	-0.60	2.90 ***
Female	0.65	0.56	0.49	0.08 ***	0.15 ***
Race/ethnicity					
White non-Hispanic	0.70	0.82	0.69	-0.12 ***	0.01
Black non-Hispanic	0.20	0.10	0.13	0.09 ***	0.07 ***
Hispanic	0.06	0.06	0.14	0.00	-0.08 ***
Other non-Hispanic	0.05	0.03	0.04	0.02 *	0.01
Is a citizen	0.98	0.97	0.91	0.01	0.07 ***
Marital status					
Married	0.29	0.61	0.51	-0.32 ***	-0.22 ***
Divorced/separated/widowed	0.34	0.17	0.18	0.17 ***	0.16 ***
Never been married	0.33	0.20	0.23	0.13 ***	0.10 **
Marital status is missing	0.04	0.03	0.08	0.01	-0.04 ***
Family size	2.82	3.19	3.37	-0.37 ***	-0.55 ***
Has any kids	0.52	0.56	0.58	-0.04	-0.06 **
Education					
Less than high school	0.43	0.15	0.41	0.28 ***	0.02
High school diploma/some college	0.53	0.74	0.54	-0.21 ***	-0.01
Bachelors degree or more	0.04	0.11	0.05	-0.07 ***	-0.01
Income and Work Status					
Income					
Less than 100% FPL	0.69	0.26	0.50	0.43 ***	0.19 ***
100-200% FPL	0.31	0.74	0.50	-0.43 ***	-0.19 ***
Work status					
Worked full-time full-year last year	0.06	0.41	0.27	-0.34 ***	-0.20 ***
Other work	0.29	0.33	0.44	-0.04	-0.14 ***
No work in last year	0.64	0.26	0.30	0.38 ***	0.34 ***
Works mostly between 6am-6pm	0.18	0.50	0.46	-0.32 ***	-0.28 ***
Health and disability status					
Health status is fair or poor	0.46	0.15	0.25	0.31 ***	0.21 ***
Has health limitation	0.57	0.16	0.18	0.42 ***	0.39 ***
Delivered baby in last year	0.05	0.02	0.01	0.03 ***	0.04 ***
Own car or other vehicle	0.69	0.90	0.77	-0.21 ***	-0.08 ***
Sample size	2,130	5,473	3,647		

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 12: Regression-Adjusted Differences in Access to Care in Rural Areas Among Low-Income Adults, by Insurance Status

	Medicaid	Private Insurance	Uninsured	Difference: Medicaid - Private Insurance	Difference: Medicaid - Uninsured
Simple Differences					
Usual Source of Care	84.6%	88.5%	64.0%	-3.9 **	20.6 ***
Doctor Visit	78.5%	67.1%	39.9%	11.4 ***	38.6 ***
Pap Smear	57.4%	58.2%	36.6%	-0.8	20.8 ***
Dental Visit	45.1%	62.6%	35.4%	-17.5 ***	9.7 ***
ER Visit	44.2%	24.3%	27.1%	19.9 ***	17.1 ***
Hospital stay	8.3%	3.1%	2.2%	5.2 ***	6.1 ***
Unmet Need for Medical Care	10.8%	6.4%	14.9%	4.4 ***	-4.1 ***
Differences Controlling for Individual Characteristics					
Usual Source of Care	85.6%	87.5%	68.6%	-1.9	17.0 ***
Doctor Visit	71.7%	69.2%	46.2%	2.5	25.4 ***
Pap Smear	57.7%	59.3%	38.7%	-1.6	18.9 ***
Dental Visit	49.6%	60.4%	37.6%	-10.8 ***	12.0 ***
ER Visit	36.3%	27.7%	27.6%	8.6 ***	8.7 ***
Hospital stay	6.5%	4.4%	2.8%	2.1	3.7 **
Unmet Need for Medical Care	8.3%	7.3%	17.5%	0.9	-9.2 ***
Differences Controlling for Individual Characteristics and the Local Supply of Providers					
Usual Source of Care	85.3%	87.3%	68.4%	-2.1	16.9 ***
Doctor Visit	71.4%	68.9%	45.9%	2.5	25.6 ***
Pap Smear	57.6%	59.5%	38.7%	-1.8	18.9 ***
Dental Visit	49.5%	60.4%	37.6%	-10.9 ***	11.9 ***
ER Visit	36.3%	27.5%	27.5%	8.8 ***	8.8 ***
Hospital stay	6.5%	4.4%	2.9%	2.1	3.6 **
Unmet Need for Medical Care	8.2%	7.3%	17.6%	1.0	-9.3 ***
Sample size	2,130	5,473	3,647		

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 13: Regression-Adjusted Differences in Access to Care in Rural Areas for Subgroups of Medicaid Beneficiaries, by County Medicaid MMC Status

	All Medicaid			SSI Medicaid			Non-SSI Medicaid		
	MMC	FFS	Difference	MMC	FFS	Difference	MMC	FFS	Difference
Simple Differences									
Usual Source of Care	87.7%	80.1%	7.6 **	90.7%	85.4%	5.3	86.6%	76.5%	10.1 *
Doctor Visit	81.7%	73.7%	8.0 **	87.5%	79.6%	7.9	79.6%	69.7%	9.9 **
Pap Smear	58.2%	56.2%	2.0	52.2%	47.5%	4.7	60.4%	62.3%	-1.9
Dental Visit	46.9%	42.4%	4.5	41.8%	0.396	2.2	48.8%	44.3%	4.5
ER Visit	42.3%	46.9%	-4.6	43.3%	43.3%	0.0	41.9%	49.4%	-7.5
Hospital stay	9.6%	6.3%	3.3	7.3%	7.1%	0.2	10.5%	5.8%	4.7
Unmet Need for Medical Care	11.1%	10.4%	0.7	9.9%	11.3%	-1.4	11.5%	9.7%	1.8
Differences Controlling for Individual Characteristics									
Usual Source of Care	89.9%	80.8%	9.1 **	92.6%	84.2%	8.4 **	88.5%	79.3%	9.2 *
Doctor Visit	81.7%	74.5%	7.2 *	91.9%	80.7%	11.1 *	77.4%	71.5%	5.9
Pap Smear	58.0%	58.6%	-0.7	51.1%	50.9%	0.2	61.0%	63.5%	-2.4
Dental Visit	47.6%	44.4%	3.2	41.2%	42.6%	-1.4	50.9%	43.5%	7.4
ER Visit	42.7%	47.3%	-4.7	45.8%	46.8%	-1.0	41.0%	49.9%	-8.9
Hospital stay	9.9%	6.7%	3.2	6.9%	6.4%	0.6	10.5%	7.7%	2.9
Unmet Need for Medical Care	11.1%	10.9%	0.2	11.1%	12.1%	-1.0	11.5%	10.3%	1.2
Differences Controlling for Individual Characteristics and the Local Supply of Providers									
Usual Source of Care	89.7%	80.8%	8.9 **	92.4%	83.8%	8.6 **	88.8%	79.6%	9.2 *
Doctor Visit	83.3%	74.7%	8.5 **	92.5%	79.8%	12.7 **	79.9%	71.6%	8.3 *
Pap Smear	58.5%	59.2%	-0.7	50.1%	50.1%	-0.1	61.5%	63.4%	-1.9
Dental Visit	47.3%	44.7%	2.6	41.2%	43.4%	-2.2	50.4%	43.4%	7.0
ER Visit	41.5%	47.8%	-6.3	44.3%	45.8%	-1.5	40.1%	49.6%	-9.5
Hospital stay	9.3%	6.8%	2.6	6.4%	6.3%	0.1	10.0%	7.7%	2.3
Unmet Need for Medical Care	10.2%	10.5%	-0.3	10.3%	12.0%	-1.7	10.6%	9.5%	1.0
Sample size	1,235	895		233	427		1,002	468	

Note: Regression models include individual characteristics and local supply of providers.

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.

Table 14: Regression-Adjusted Differences in Access to Care in Rural Areas for Low-Income Medicaid and Privately Insured Individuals, By County Medicaid Managed Care Status

	Medicaid	Private Insurance	Difference
In County with Medicaid Managed Care			
Usual Source of Care	89.7%	87.4%	2.3
Doctor Visit	74.1%	68.7%	5.4 **
Pap Smear	59.8%	59.4%	0.3
Dental Visit	53.1%	61.0%	-7.9 ***
ER Visit	33.4%	28.5%	4.9
Hospital stay	8.0%	4.0%	4.0 *
Unmet Need for Medical Care	8.7%	7.7%	1.0
Sample Size	1,235	3,445	
In County with FFS Medicaid			
Usual Source of Care	77.5%	88.8%	-11.3 ***
Doctor Visit	66.4%	70.2%	-3.9
Pap Smear	54.5%	61.6%	-7.1
Dental Visit	44.0%	60.3%	-16.3 ***
ER Visit	41.2%	25.7%	15.5 ***
Hospital stay	4.3%	5.2%	-0.9
Unmet Need for Medical Care	7.9%	6.9%	1.1
Sample size	895	2,028	

Note: Regression-adjusted means here differ from Table 13 because of how they are constructed. In Table 13, we estimate the regression equation for all Medicaid enrollees and predict the outcome value assuming all enrollees are in counties with MMC and then assuming all enrolles are in counties with FFS Medicaid. In this table, we estimate the regression equation separately for individuals residing in counties with MMC and those in counties operating FFS Medicaid. After estimating each equation, we then predict the outcome value first assuming all individuals are Medicaid enrollees and then assuming all individuals are privately insured.

Source: 1997, 1999, 2002 National Survey of America's Families.

* (**) (***) Significantly different from zero at the .10 (.05) (.01) level, two-tailed test.