



## Rural Adults Delay, Forego, and Strategize to Afford Their Pre-ACA Health Care

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### OVERVIEW

About 40% of non-elderly adults reported problems paying medical bills or cost-related barriers to obtaining needed medical care in 2012,<sup>1</sup> difficulties that are especially pronounced for the uninsured and underinsured, the chronically-ill, and those with low incomes.<sup>2-6</sup> Given their lower incomes and higher uninsured rates compared to urban residents,<sup>7</sup> rural residents may face particular cost barriers in accessing health care. Past research has shown that, compared to urban residents, rural residents are more likely to experience higher out-of-pocket costs and delayed or foregone care as a result of cost,<sup>8</sup> even when covered by private health insurance.<sup>9</sup> However, these studies present a limited view of the problems that rural residents may face in affording health care.

Studies examining the consequences of cost-related barriers to care document widespread non-adherence to prescription regimens within Medicare,<sup>3,4,10</sup> while increased cost-sharing was shown to be a primary driver behind disenrollment from a state Medicaid program.<sup>11</sup> Small area qualitative studies reveal that when faced with significant costs, rural residents and persons with specific chronic conditions reduce or eliminate medication, amass and share medication with others, limit other expenses, use home remedies, comparison shop for the best prices, and seek help through providers<sup>12</sup> as well as go without or delay care, or use emergency care.<sup>13,14,15</sup>

The insurance expansion provisions of the Affordable Care Act (ACA) passed in 2010 and implemented in 2013, aim to reduce financial access barriers to health care. This study provides detailed pre-ACA information about rural-urban differences among adults under age 65 in perceived affordability of health insurance coverage and services. We look specifically at self-reported difficulty paying medical bills and affording services, strategies to reduce cost, and delaying or forgoing needed care. In doing so, we provide baseline data for understanding the ACA's potential impact on rural communities as well as information about residents' affordability perceptions, which may help inform outreach and enrollment strategies.

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### Key Findings

#### Prior to the Affordable Care Act:

In 2011-2012, rural adults were about 20% less likely than their urban counterparts to express confidence in their ability to find affordable, non-group health insurance coverage.

Rural adults were more likely than urban adults to report problems paying their medical bills and to delay or forego needed care because of cost.

To control costs, rural adults were more likely to skip medication doses, take less medicine, delay filling prescriptions, or ask their physician for a lower cost prescription than urban adults.

Problems with health care affordability and the use of cost-saving strategies among rural adults appear to be explained by lower income and insurance coverage.

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## APPROACH

In 2011-2012, the National Health Interview Survey (NHIS) introduced a new access and affordability module in response to Congressional requirements for monitoring the ACA's impact. This module provides the opportunity to better understand rural-urban differences in financial access to care prior to ACA implementation and to track the rural impact of ACA insurance expansions over time.

**Data Source.** This study used data from the 2011 and 2012 NHIS. Our sample contained 128,473 respondents between ages 18 and 64, with 19,358 (13.8%) living in rural counties. We limited our analysis to adults because several of the questions that were the primary focus of our investigation, such as questions on coping with health care costs, were asked only of this population. In addition, adults under 65 are the primary targets of the ACA's health insurance initiatives. Because the public-use NHIS datasets do not contain a rural-urban indicator, we followed the process of the National Center for Health Statistics' Research Data Center (RDC) to link the NHIS to county level indicators of rural and urban residence.

**Analysis.** We used a combination of bivariate and multivariate analyses to address the question of whether rural residents faced greater health care affordability challenges than their urban counterparts in the years prior to ACA implementation. Our independent variable was rural or urban residence based on Office of Management and Budget metropolitan and non-metropolitan county designations. Covariates included characteristics known to influence access to care including sex, race and ethnicity, health status, region of the country, education, marital status, insurance coverage, and family income. We weighted our analyses to adjust for the complex sampling design of the NHIS. All statistical tests were completed in SUDAAN version 11 to adjust for clustering and to yield valid standard errors for weighted data. At the bivariate level, frequency differences were evaluated with chi-square tests of significance. We reported differences at or below the 0.05 level of significance. At the multivariate level, we fit a series of logistic regression models to understand more fully the impact of rural residency and other factors on affordability of health services.

## FINDINGS

**Confidence and difficulties in affording health care.** Prior to the ACA, rural adults under 65 were almost 20% less likely than their urban counterparts to express confidence in their ability to obtain affordable individual insurance on their own,

without an employer (33.0% vs. 40.4%, data not shown). Rural adults were more likely to report that they pay medical bills over time or that they had problems paying their medical bills compared to urban residents in the previous year (Figure 1). Rural adults were more likely than urban to report delaying or forgoing needed medical care in the past year as a result of cost (Figure 1).

### **Purchasing health care items or services.**

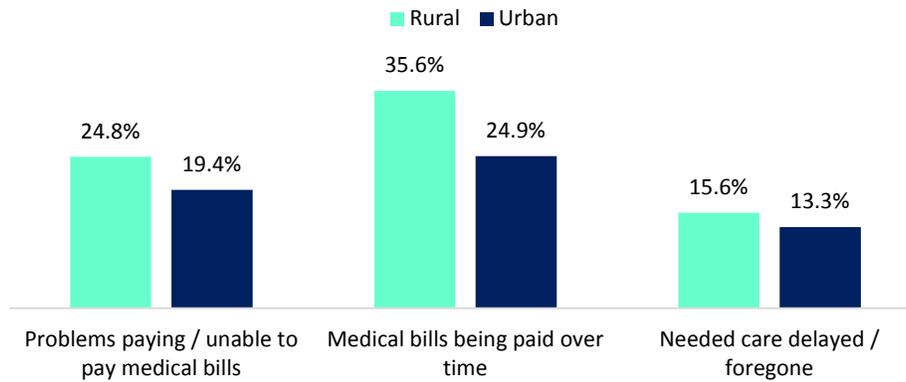
Rural adults were more likely than their urban counterparts to say they could not get prescription medicine (11.6% vs. 9.7%) and eyeglasses (10.3% vs. 8.6%) in the past year because these items were too expensive. In both rural and urban areas, about 16% of adults reported going without dental care in the past year because of the expense.

**Cost-saving strategies for prescriptions.** As shown in Figure 2, rural adults were more likely to employ cost-saving strategies with their prescriptions than urban adults. To save money over the prior year, rural adults were more likely to skip medication doses, take less medicine, or delay filling a prescription than urban adults. Rural adults were also more likely to have asked their doctor for a lower cost medication. Urban adults were more likely than rural adults to have purchased prescription drugs through another country (2.2% vs. 1.1%) or to have used alternative therapies (5.4% vs. 4.6%).

**Factors associated with rural-urban differences in financial barriers to care.** We estimated a series of logistic regression models to determine what factors were associated with rural-urban differences in the odds of problems affording medical care (Table 1). In the bivariate analysis, we found that rural adults were more likely to employ cost-saving strategies with their prescription drugs. However, as shown in Table 1, Model 1, the odds of using cost-saving strategies were actually lower among rural adults than urban (OR: 0.90, CI: 0.81, 1.00,  $p = .05$ ) after controlling for socio-economic characteristics, including insurance coverage. Adults under 65 with Medicare or who were uninsured had significantly higher odds of employing cost-saving strategies compared to those with private or military coverage. Medicaid and other sources of public coverage (not Medicare) were associated with lower odds of cost-saving strategies. The odds of using cost-saving strategies were roughly double for adults with family income below 400% of the federal poverty level.

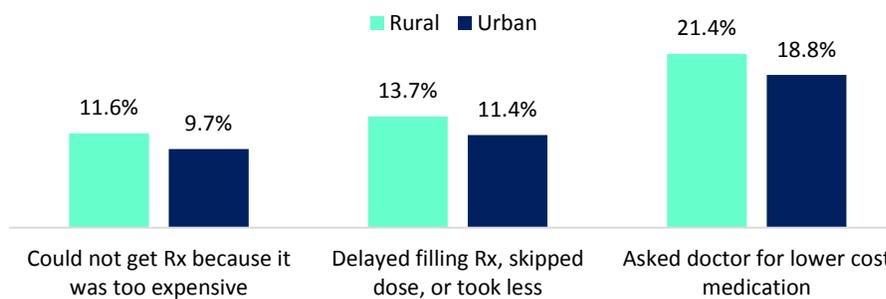
In the bivariate analysis, rural adults were more likely to pay their medical bills over time and this finding persisted in the multivariate analysis

**Figure 1: Problems Affording Care In Past Year Among Rural and Urban Adults Under 65**



Source: National Health Interview Survey, pooled 2011 and 2012 Person Files.

**Figure 2: Problems Affording Prescriptions and Cost-Saving Strategies in Past Year Among Rural and Urban Adults Under Age 65**



Source: National Health Interview Survey, pooled 2011 and 2012 Person Files.

Notes: Rural-urban differences significant at  $p \leq .01$ .

(Table 1, Model 2). The odds of paying medical bills over time were 33% higher among rural adults than urban, holding socio-economic characteristics constant. Additionally, persons with Medicare coverage or the uninsured, and persons with family income below 400% of poverty were more likely to pay their medical bills over time. Again, Medicaid and other public coverage had a protective effect such that individuals with this coverage had 22% lower odds of paying bills over time compared to the privately insured. Though we found that rural adults had problems paying their medical bills or were unable to pay medical bills in the bivariate analysis, there was no rural-urban difference in the multivariate analysis (Table 1, Model 3).

We ran several multivariate models to evaluate the likelihood of delaying or foregoing health care. When we controlled for socio-demographic characteristics without health insurance and family income in the model, the difference in the likelihood of delaying or foregoing health care as a result of cost for rural adults ceased to be significant compared to urban residents (data not shown). With the inclusion of health insurance and family income (Table 1, Model 4), the rural-urban variable became significant and protective (OR: 0.86, CI: 0.80, 0.93), suggesting that, given equivalent insurance and income status, rural adults were less likely to delay or forego care. The characteristics associated with the likelihood of delaying or foregoing care as

**Table 1****Odds of Experiencing Difficulties Affording Medical Care Among Rural and Urban Adults Under 65, 2011-12**

Characteristic (referent)	Model 1: Cost-Saving Strategies		Model 2: Medical Bills Being Paid Over Time		Model 3: Problems Paying Medical Bills		Model 4: Delayed or Foregone Care Due to Cost	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Rurality (urban)	0.90*	0.81, 1.00	1.33***	1.23, 1.44	1.00	0.93, 1.08	0.86***	0.80, 0.93
Sex (male)								
Female	1.77***	1.65, 1.90	1.11***	1.09, 1.14	1.15***	1.12, 1.18	1.30***	1.26, 1.35
Race / Ethnicity (White, Not Hispanic)								
Not White, Not Hispanic	0.90*	0.81, 0.99	1.08*	1.00, 1.16	1.12**	1.04, 1.20	0.71***	0.67, 0.76
Any race, Hispanic	0.66***	0.59, 0.72	0.88***	0.82, 0.94	0.78***	0.72, 0.84	0.57***	0.53, 0.60
Other	0.58***	0.50, 0.68	0.58***	0.53, 0.64	0.53***	0.47, 0.59	0.47***	0.41, 0.53
Health status (excellent/very good)								
Good	2.10***	1.92, 2.29	1.43***	1.37, 1.49	1.71***	1.63, 1.79	1.91***	1.82, 2.00
Fair/poor	4.42***	4.02, 4.87	2.01***	1.91, 2.13	3.18***	2.99, 3.38	4.31***	4.07, 4.58
Region (Northeast)								
Midwest	1.15*	1.00, 1.31	1.72***	1.57, 1.88	1.26***	1.15, 1.38	1.24***	1.13, 1.35
South	1.25***	1.11, 1.41	1.60***	1.47, 1.74	1.25***	1.15, 1.35	1.18***	1.09, 1.27
West	1.18**	1.04, 1.33	1.34***	1.23, 1.47	1.09*	1.00, 1.19	1.40***	1.30, 1.51
Education (college or more)								
Less than high school	0.82**	0.72, 0.93	1.05	0.99, 1.11	1.08*	1.01, 1.15	0.61***	0.56, 0.65
High school or some college	0.94	0.87, 1.02	1.33***	1.27, 1.38	1.25***	1.19, 1.31	0.81***	0.77, 0.85
Marital status (Not married)								
Married	1.01	0.94, 1.09	1.18***	1.14, 1.23	0.95**	0.91, 0.99	0.74***	0.70, 0.77
Insurance coverage (private/military)								
Medicare	1.66***	1.38, 1.99	1.19***	1.09, 1.31	1.32***	1.18, 1.48	1.31***	1.16, 1.49
Medicaid/Duals/SCHIP/Other public	0.87*	0.77, 0.99	0.78***	0.73, 0.84	1.01	0.94, 1.09	0.90*	0.83, 0.98
Uninsured/IHS	2.40***	2.18, 2.64	1.26***	1.20, 1.33	2.06***	1.95, 2.18	5.18***	4.90, 5.48
Family income (400% FPL or higher)								
<100% FPL	2.34***	2.03, 2.70	1.26***	1.16, 1.38	2.85***	2.60, 3.13	2.63***	2.40, 2.89
100-199% FPL	2.33***	2.04, 2.66	1.84***	1.71, 1.98	3.50***	3.22, 3.81	2.77***	2.56, 3.01
200-399% FPL	1.99***	1.77, 2.24	1.89***	1.78, 2.00	2.60***	2.42, 2.78	2.00***	1.85, 2.16

**Source:** National Health Interview Survey, pooled 2011 and 2012 Person Files.

**Notes:** CI is confidence interval. \*p<.05, \*\*p<.01, \*\*\*p<.001

a result of cost include being uninsured or having Medicare, having less than excellent or very good health, and living outside of the Northeast. In contrast, Medicaid (and other non-Medicare public coverage, such as a state health plan) reduced the odds of using a cost-saving strategy, paying medical bills over time, and delaying or foregoing care due to cost compared to having private or military insurance.

**Study limitations.** Because the NHIS does not contain actual cost-sharing information for those with insurance coverage, we were not able to assess the extent to which benefit design may account for the observed affordability differences. Additionally, as suggested by Piette et al.,<sup>16</sup> NHIS data do not reveal whether cost-saving strategies are used consistently or infrequently by respondents, which could alternatively minimize or overstate the extent of medication under-use. However, research has

shown that most patients consistently rather than infrequently underuse their medications.<sup>16</sup>

## DISCUSSION

Provisions of the ACA may reduce financial barriers to care for rural residents. Results indicate that, prior to ACA implementation, rural adults faced greater cost-related barriers to health care use, including low confidence in their ability to find affordable non-group coverage. Rural adults are more likely to purchase individual health coverage given their higher rates of self-employment, unemployment, and low-wage employment than urban adults.<sup>7</sup> The ACA has the potential to reduce the cost burden among rural residents who purchase individual coverage through the Health Insurance Marketplace, and thus confidence about health insurance coverage may improve.

Our bivariate findings indicate that rural adults were more likely to employ cost-saving strategies to

stretch their use of prescription drugs and were more likely to delay or forego needed care— differences that appear to be explained by lower income and insurance coverage pre-ACA. These attempts to rein in personal health spending may ultimately contribute to poorer rural health status, as forgoing preventive screenings,<sup>17</sup> receiving late diagnoses,<sup>18</sup> and worsening health status<sup>19,20</sup> have been found to result from cost-reduction strategies for health care use. Thus, the extent to which participation in ACA health insurance coverage reduces underuse of appropriate and necessary health care among rural adults may have important long-term implications for their health.

Before ACA implementation, rural residents were also more likely to report problems paying medical bills or to carry medical debt. These factors may affect health care access as well as the financial well-being of rural individuals and families. Prior research suggests that when health care costs are unaffordable, other areas suffer, such as the ability to afford basic needs<sup>21</sup> and may extend to applying for a loan, a home mortgage, or credit card debt to pay medical bills.<sup>6</sup> The ACA may reduce this barrier to rural healthcare access and financial stability because all health plans must offer free preventive care and may no longer impose lifetime and yearly dollar limits on coverage of essential health benefits, while Marketplace plans must also offer premium tax credits based on income and household size. Of particular importance to rural adults who report forgoing prescription drugs in the past year due to expense, Marketplace plans must include prescription drug coverage as an essential health benefit. However, given that deductibles, copayments, and other out-of-pocket costs differ by Marketplace plan type, it is possible that rural adults – who are more likely to have lower incomes than urban adults -- will choose lower cost plans with higher cost-sharing. This out-of-pocket cost burden may, however, be mitigated by the cost-sharing reduction for deductibles, coinsurance, and copayments among silver plans available to lower income Marketplace enrollees. While we do not yet know the proportion of rural residents choosing from among the metal plans, we do know that about two-thirds of enrollees nationwide have chosen silver plans<sup>22</sup> and that platinum plans are less likely to be offered in rural counties.<sup>23</sup> Platinum plans have the highest premiums yet offer low cost-sharing, which can make health care more affordable at the time of service. Although silver plans have higher cost-sharing than gold or platinum, their capacity to

offer cost-sharing reductions for low-income enrollees may provide strong financial protection for the rural residents who select them.

The ACA's Medicaid expansion could improve affordability of health care for some rural adults, particularly since our findings show that those with incomes below poverty have higher odds of affordability problems, while Medicaid (and other non-Medicare public coverage) had a protective effect in three of the four models. Although more rural uninsured adults had incomes in the target range for expansion than the urban uninsured, low-income rural adults were less likely than their urban counterparts to live in a state that had elected to expand Medicaid as of January 2014.<sup>25</sup> Reducing the rural-urban disparities in health care affordability may not be accomplished under the Medicaid expansion unless additional states choose that option in the future. It is worth noting, however, that while further Medicaid expansions could certainly benefit rural adults, prior research showing that Medicaid beneficiaries are sensitive to cost sharing requirements suggests that how states choose to structure their expansions may also be critical.<sup>11</sup> Thus, it will be important to monitor cost-sharing requirements and their impact on rural affordability and access within Medicaid expansion programs, particularly in expansion states that choose to enroll new Medicaid beneficiaries in private health plans.

Results from this study indicate that, prior to ACA implementation, rural residents faced greater financial challenges in affording care than urban adults. While aspects of the ACA have the potential to reduce these challenges for rural residents, the availability of data to assess the rural impact are currently limited. Future research should monitor the extent to which rural adults are enrolling in Marketplace plans or in expanded Medicaid, as well as any shifts in affordability that may occur over time. Additionally, knowing rural perceptions of affordability may guide navigators who should be prepared to discuss cost components of Marketplace plans when enrolling rural adults.

## ENDNOTES

1. Collins SR, Robertson R, Garber T, Doty MM. *Insuring the Future: Current Trends in Health Coverage and the Effects of Implementing the Affordable Care Act*. New York, NY: Commonwealth Fund;2013.
2. Kullgren JT, Galbraith AA, Hinrichsen VL, et al. Health Care Use and Decision Making among Lower-Income Families in High-Deductible Health Plans. *Arch Intern Med*. Nov 22 2010;170(21):1918-1925.
3. Bambauer K, Safran D, Ross-Degnan D, et al. Depression and Cost-Related Medication Nonadherence in Medicare Beneficiaries. *Arch Gen Psychiatry*. 2007;64(5):602-608.
4. Soumerai SB, Pierre-Jacques M, Zhang F, et al. Cost-Related Medication Nonadherence among Elderly and Disabled Medicare Beneficiaries: A National Survey 1 Year before the Medicare Drug Benefit. *Arch Intern Med*. 2006;166(17):1829-1835.
5. Harrold LR, Briesacher BA, Peterson D, et al. Cost-Related Medication Nonadherence in Older Patients with Rheumatoid Arthritis. *J Rheumatol*. Feb 2013;40(2):137-143.
6. Schoen C, Doty MM, Robertson RH, Collins SR. Affordable Care Act Reforms Could Reduce the Number of Underinsured US Adults by 70 Percent. *Health Aff (Millwood)*. 2011;30(9):1762-1771.
7. Lenardson JD, Ziller EC, Coburn AF, Anderson NJ. *Profile of Rural Health Insurance Coverage: A Chartbook*. Portland, ME: University of Southern Maine, Muskie School of Public Service, Maine Rural Health Research Center;2009.
8. Reschovsky JD, Staiti AB. Access and Quality: Does Rural America Lag Behind? *Health Aff (Millwood)*. 2005;24(4):1128-1139.
9. Ziller EC, Coburn AF, Yousefian AE. Out-of-Pocket Health Spending and the Rural Underinsured. *Health Aff (Millwood)*. 2006;25(6):1688-1699.
10. Madden JM, Graves AJ, Zhang F, et al. Cost-Related Medication Nonadherence and Spending on Basic Needs Following Implementation of Medicare Part D. *JAMA*. 2008;299(16):1922-1928.
11. Wright BJ, Carlson MJ, Edlund T, DeVoe J, Gallia C, Smith J. The Impact of Increased Cost Sharing on Medicaid Enrollees. *Health Aff (Millwood)*. 2005;24(4):1106-1116.
12. Goins RT, Williams KA, Carter MW, Spencer M, Solovieva T. Perceived Barriers to Health Care Access among Rural Older Adults: A Qualitative Study. *J Rural Health*. 2005;21(3):206-213.
13. Patel MR, Caldwell CH, Id-Deen E, Clark NM. Experiences Addressing Health-Related Financial Challenges with Disease Management among African American Women with Asthma. *J Asthma*. 2014;51(5):467-473.
14. Pieh-Holder KL, Callahan C, Young P. Qualitative Needs Assessment: Healthcare Experiences of Underserved Populations in Montgomery County, Virginia, USA. *Rural Remote Health*. 2012;12:1816.
15. Jennette CE, Vupputuri S, Hogan SL, Shoham DA, Falk RJ, Harward DH. Community Perspectives on Kidney Disease and Health Promotion from at-Risk Populations in Rural North Carolina, USA. *Rural Remote Health*. 2010;10(2):1388.
16. Piette JD, Heisler M, Wagner TH. Cost-Related Medication Underuse among Chronically Ill Adults: The Treatments People Forgo, How Often, and Who Is at Risk. *Am J Public Health*. 2004;94(10):1782-1787.
17. Casey MM, Thiede Call K, Klingner JM. Are Rural Residents Less Likely to Obtain Recommended Preventive Healthcare Services? *Am J Prev Med*. 2001;21(3):182-188.
18. Higginbotham JC, Moulder J, Currier M. Rural V. Urban Aspects of Cancer: First-Year Data from the Mississippi Central Cancer Registry. *Fam Community Health*. 2001;24(2):1-9.
19. Mojtabei R, Olfson M. Medication Costs, Adherence, and Health Outcomes among Medicare Beneficiaries. *Health Aff (Millwood)*. 2003;22(4):220-229.
20. Heisler M, Langa KM, Eby EL, Fendrick AM, Kabeto M, Piette JD. The Health Effects of Restricting Prescription Medication Use Because of Cost. *Med Care*. 2004;42(7):626-634.
21. Naci H, Soumerai SB, Ross-Degnan D, et al. Medication Affordability Gains Following Medicare Part D Are Eroding among Elderly with Multiple Chronic Conditions. *Health Aff (Millwood)*. 2014;33(8):1435-1443.
22. The Henry J. Kaiser Family Foundation. *Marketplace Enrollees by Metal Level*, April 2014. 2014; <http://kff.org/other/state-indicator/marketplace-enrollees-by-metal-level-2014/>. Accessed 11 February, 2015.
23. Barker A, McBride TD, Kemper LM, Mueller K. *A Guide to Understanding the Variation in Premiums in Rural Health Insurance Marketplaces*. Iowa City, IA: Rural Policy Research Institute, University of Iowa;2014.
24. Lore R, Gabel JR, McDevitt R, Slover M. *Choosing the "Best" Plan in a Health Insurance Exchange: Actuarial Value Tells Only Part of the Story*. New York, NY: The Commonwealth Fund;2012.
25. Ziller EC, Lenardson JD, Coburn AF. *Rural Implications of Medicaid Expansion under the Affordable Care Act*. Minneapolis, MN: SHADAC;2015.



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