

11-2015

Out-of-Pocket Spending among Rural Medicare Beneficiaries

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Recommended Citation

Ziller EC, Lenardson JD, Coburn AF. Out-of-Pocket Spending among Rural Medicare Beneficiaries. Portland, ME: University of Southern Maine, Muskie School of Public Service, Maine Rural Health Research Center; November, 2015. Working Paper #60.

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Maine Rural Health Research Center
Working Paper #60

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This study was supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under CA#U1CRH03716. The information, conclusions and opinions expressed in this paper are those of the authors and no endorsement by FORHP, HRSA, HHS, or the University of Southern Maine is intended or should be inferred

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ACKNOWLEDGEMENTS

The authors wish to thank Karen Pearson and colleagues at the Maine Rural Health Research Center for their comments on an earlier version.

EXECUTIVE SUMMARY

Introduction

Medicare provides near-universal coverage for the elderly and is an important source of health insurance for individuals with disabilities; however, many beneficiaries face gaps between the care they need and costs covered by Medicare. The majority of beneficiaries seek supplemental coverage to meet this gap, including private plans offered by former employers or purchased individually, or public coverage through Medicaid. These supplemental insurance policies have different cost-sharing arrangements, with Medicaid, employer-based plans, and Medicare Advantage plans offering the greatest protection against high out-of-pocket spending. Since rural beneficiaries are more likely to purchase supplemental indemnity coverage individually, to participate in Medicaid, or to go without supplemental coverage altogether, it is likely that their out-of-pocket spending differs from that of urban residents, although the magnitude and direction of these differences may vary for individual beneficiaries.

Methods

Using data from the 2006-2010 Medical Expenditure Panel Survey, this study addresses the following questions: 1) Does out-of-pocket spending* for medical care differ for rural and urban Medicare beneficiaries and, if so, to what extent?; 2) How does out-of-pocket spending vary for different types of services (e.g., hospital inpatient, emergency, and office-based services, prescription drugs, and dental care)?; and 3) What factors or characteristics are associated with higher rates of spending among Medicare beneficiaries (e.g., rural residence, female, having no supplemental insurance, being in poor health)?

Findings

Among the elderly Medicare population (age 65 and older), about 20% of total healthcare spending is paid out-of-pocket with no significant differences based on residence. However, rural elderly beneficiaries pay a higher proportion of their total prescription drug costs compared to their urban counterparts. In contrast, rural beneficiaries with disabilities (beneficiaries under age 65) are responsible for nearly 18% of their healthcare expenditures compared to about 15% for urban beneficiaries under age 65. Among disabled rural

* Premiums are not included in the out-of-pocket cost calculations.

beneficiaries, those with only Medicare coverage pay nearly 30% of their total costs themselves, the largest percentage we found when examining differences in supplemental coverage. Controlling for supplemental coverage and socioeconomic characteristics, the proportion of total spending paid out-of-pocket is 40% higher among rural disabled beneficiaries compared to urban beneficiaries.

Discussion and Policy Implications

Rural Medicare beneficiaries face some significant disparities in spending burden for medical care when compared to urban beneficiaries. While the elderly showed little difference in out-of-pocket spending based on residence, the findings related to prescription drug spending indicate the need to monitor access to medications for older rural beneficiaries. For the non-elderly disabled population, our findings suggest that rural beneficiaries are at significantly greater risk of high out-of-pocket spending, and this spending may exacerbate health disparities for a particularly vulnerable population. Additional analyses are needed to understand the full consequences of this burden for the rural disabled and the policy actions that may be taken to improve access and limit financial risk for this population.

INTRODUCTION

Twenty-one percent of individuals covered by Medicare live in rural counties.¹ Although Medicare provides near-universal coverage for the elderly, and is an important source of health insurance for individuals with disabilities, many beneficiaries face gaps between the care they need and costs covered by Medicare. The majority of beneficiaries seek supplemental insurance coverage to meet this gap, including private plans offered by former employers or purchased individually, or public coverage through Medicaid. These supplemental policies have different cost-sharing arrangements, with Medicaid, employer-based, and Medicare Advantage plans offering the greatest protection against high out-of-pocket costs.² However, despite high rates of supplemental coverage, the average elderly Medicare beneficiary still spends an estimated 19% of his or her income on out-of-pocket medical expenditures including premiums.³ Medicare out-of-pocket burden increases with age³ and with the number of chronic health conditions.⁴

High cost-sharing for medical care has been associated with poorer access to care for Medicare beneficiaries. For example, lack of supplemental coverage and high out-of-pocket spending can adversely impact adherence to prescription drug regimens.^{5,6} Even small cost-sharing requirements can limit Medicare beneficiaries' use of preventive services such as mammograms.⁷ The Affordable Care Act (ACA) addresses this access issue by including the provision of preventive care services under Medicare at zero cost to beneficiaries. However, cost barriers to other types of care, particularly cost-saving disease management services, may remain. In addition, redesigning Medicare beneficiary cost-sharing has begun to attract the attention of researchers⁸ and policymakers. In its June 2010 Report to Congress, MedPAC recommended changing the Medicare benefit design and the plans that supplement it to promote care coordination and incentivize services with substantial clinical benefit, while protecting low-income beneficiaries from high cost-sharing.⁹

Rural beneficiaries are more likely to purchase supplemental insurance coverage individually, to participate in Medicaid, or to go without supplemental coverage altogether.¹⁰ As a result, it is likely that their out-of-pocket spending differs from those of urban residents. However, rural-urban differences in cost-sharing for Medicare beneficiaries are not well understood. This study addresses this gap by examining current out-of-pocket spending among Medicare

beneficiaries and evaluating rural-urban differences in different types and amounts of cost-sharing as well as the factors associated with these differences. Should Medicare redesign occur, the study findings will inform the debate on policy options and provide important information against which to assess the possible impact of different design options on rural Medicare beneficiaries.

BACKGROUND

Medicare Beneficiaries Face Significant Cost-Sharing Requirements

While methods for estimating the burden of cost-sharing and out-of-pocket spending vary substantially between research studies, there is a growing body of literature that indicates a real and growing problem for at least some beneficiaries. Depending on their health and supplemental coverage status, individuals with Medicare may face significant cost-sharing for their healthcare services and these costs have risen in recent years. In 2011, the average out-of-pocket costs for Medicare beneficiaries exceeded those of the non-elderly with coverage through a typical large employer preferred provider organization (\$2,960 compared to \$2,090).¹¹ Between 1997 and 2003, beneficiaries' median out-of-pocket spending increased by 50% compared to median income, which grew by 15%, meaning that out-of-pocket spending relative to income increased from 11.9% of income to 15.5% of income.¹² Including healthcare costs and premiums for supplemental coverage, beneficiaries in the traditional fee-for-service program incurred average out-of-pocket spending of \$3,138 in 2007, while approximately 10% spent nearly \$8,000.¹³ These dollar values represent 16-17% of income for the average beneficiary, while 25% of beneficiaries with the highest costs spent 30% or more of their income on healthcare (including premiums) and the top 10% spent 58% of their income or more.^{12,13}

The high cost of healthcare can have serious negative consequences, such as bankruptcy,^{14,15} increased credit card or other debt,¹⁶ difficulties paying for basic necessities,¹⁷ and delayed or foregone needed medical care.¹⁸ While requiring greater cost-sharing may reduce service use and program spending, some beneficiaries may forego needed services,^{19,20} especially those with chronic conditions²¹ and low-incomes.²²

Characteristics Associated with Out-of-Pocket Spending and Burden

Certain groups of beneficiaries are at greater risk of experiencing high out-of-pocket spending or having this spending be burdensome to their financial well-being. For example, out-of-pocket spending, both in total dollars and as a proportion of income, is higher among those age 85 and older, women, and non-Hispanic whites.^{3,13,23,24} Beneficiaries in poor health or who have multiple chronic health conditions also tend to spend more in absolute dollars and relative to their income^{3,13,23,24} as do those living in institutional settings.¹² Medicare families in poor health are twice as likely to incur high healthcare expenditures compared to families reporting excellent health status.²⁵

Absolute out-of-pocket spending for Medicare beneficiaries varies somewhat by income, but the difference relative to income indicates that certain groups are particularly vulnerable to financial stress from medical costs. For example, the average beneficiary with income below 200% of poverty spent about 22% of income on healthcare, while those above 400% of poverty spent less than 8% on healthcare. Other research shows that average health spending (including premiums) as a percent of individual income was highest among those with modest incomes, between 200-299% of FPL.¹² Households in this income category spent 17% of total household income on healthcare (including health insurance premiums, medical services and supplies, and prescription drugs), compared to 13% of those with income below 100% FPL, with Medicaid reducing out-of-pocket spending for very low-income households.²⁶

The Impact of Supplemental Coverage

Approximately 90% of Medicare beneficiaries have some form of supplemental coverage or participate in a Medicare Advantage plan to reduce their out-of-pocket costs for healthcare services.^{3,13,23,24} Supplemental plans can take the form of employer-sponsored retiree health plans, Medicaid, or individually-purchased Medigap plans. Additionally, TRICARE for Life is the supplemental insurance program for military service members who receive Medicare Part A and B, covering select out-of-pocket expenses.²⁷ Medicare Advantage plans may function like supplemental coverage, offering additional benefits, such as prescription drugs, vision, and dental, and reducing beneficiary cost-sharing.^{28,29}

Differences in supplemental coverage are associated with different levels of absolute and relative out-of-pocket healthcare spending. When including premiums as a cost, the purchase

of individual supplemental policies is associated with greater absolute out-of-pocket spending, and spending as a percent of income, compared to employer-sponsored coverage.³ The same study indicates that those without any supplemental insurance spend less out-of-pocket than those with employer coverage, but a much higher percentage of their income is spent on medical expenditures.³ An analysis of 2003 data found that, including premiums, the median ratio of out-of-pocket spending for elderly beneficiaries was 23% of income for beneficiaries with individual (Medigap) supplemental coverage, 18% for those without supplemental coverage, and 13-14% for those with employer-sponsored coverage or Medicare Advantage plans.¹² Beneficiaries enrolled in Medicare Advantage plans are less likely to have premiums and out-of-pocket spending exceeding 10% of their income, compared to those with traditional Medicare (25% vs 36%).²⁹ Medicare beneficiaries who are also eligible for Medicaid (“dual eligibles”) have the lowest median out-of-pocket spending, both in absolute dollars and as a proportion of their income.¹³

Beneficiaries Under Age 65

Representing 17% of the Medicare population, persons under age 65 can become eligible for Medicare if they have received Social Security Disability Insurance payments for 29 months. Compared to the elderly Medicare population (age 65 and older), beneficiaries under 65 are more likely to have a mental impairment, low-income, and fair or poor health. A large proportion are black or Hispanic, and male.³⁰ A greater proportion of non-elderly disabled beneficiaries have prescription drug coverage compared to elderly beneficiaries (70% vs. 57%), largely due to their dual eligibility for Medicaid.³⁰ The under 65 disabled are more likely to go without any type of supplemental coverage compared to beneficiaries 65 and older; one-fifth of beneficiaries under 65 have only Medicare compared to 8% of those over age 65. When they do have supplemental coverage, disabled Medicare beneficiaries under 65 are more likely to have Medicaid coverage compared to those 65 and older and Medicaid is the primary source of supplemental coverage for this group.³¹

Despite similar average Medicare costs among under age 65 and 65 and older Medicare beneficiaries,³⁰ the under 65 disabled are more likely to report cost-related problems such as trouble paying for their healthcare bills or health insurance premiums, spending less on basic needs to pay for healthcare, and delaying or foregoing needed health care because of cost

compared to beneficiaries 65 and older.³¹ Among those who report delaying or forgoing care as a result of cost, under 65 disabled beneficiaries are more likely to report negative health outcomes such as worsening of a health problem, physical pain, and anxiety.³¹ In an analysis of Medicare data from 1996, nearly one-third of persons under 65 with a disability reported dissatisfaction with spending compared to 18% of older persons with similar conditions.³² Medicaid has been shown to reduce out-of-pocket spending among the non-elderly Medicare population.^{31,33} For example, compared to persons without dual-eligibility, Medicaid coverage reduced annual out-of-pocket costs for all services from \$1,361 to \$523 and outpatient drugs from \$413 to \$148 in 1995.³⁴

Medicare Part D Reduces Prescription Drug Spending for Some Beneficiaries

Medicare Part D is a voluntary outpatient prescription drug benefit created under the Medicare Modernization Act of 2003. It is subsidized by Medicare and may be obtained through a private Medicare Advantage plan (MA-PD) or an independent Medicare prescription drug plan (PDP). In 2012, the standard benefit included a \$320 deductible and 25% coinsurance up to \$2,930 in total drug costs. After this amount, enrollees pay for all their costs (commonly referred to as a coverage gap or “the donut hole”) until their total out-of-pocket prescription spending reaches a catastrophic amount (\$4,700 in 2012).[†] Once the catastrophic amount is reached, enrollees pay either 5% of total spending or a small amount for each drug.³⁵ These cost-sharing requirements renew annually.³⁶

How this cost-sharing structure affects beneficiary access to drugs varies by type of plan. For Medicare beneficiaries 65 and over, those with employer drug coverage reported the lowest rate of unmet needs (2.5%) in 2007. Employer-sponsored plans typically offer more generous coverage, without the coverage gap, than independently purchased plans. MA-PD plans and individually purchased Part D plans typically include formularies, which may mean substantial cost-sharing for brand-name and specialty drugs.³⁷ Some Part D plans and MA-PD plans offer coverage of generic drugs in the coverage gap, but very few offer coverage of brand name drugs in the gap.³⁸ Dually eligible beneficiaries are automatically enrolled in a Part D plan and receive a low-income subsidy, which eliminates premiums for the standard benefit and

[†] Medicare will gradually reduce the beneficiary coinsurance rate in the coverage gap to 25% by 2020 by phasing in additional subsidies for prescription drugs.³⁴

deductibles, covers the doughnut hole, and otherwise limits cost-sharing. Due to transition problems into Part D, 21% of dually eligible beneficiaries reported difficulty affording prescription drugs in 2007, up from 11% in 2003.³⁷ Rural beneficiaries are more likely than urban beneficiaries to enroll in stand-alone PDP while urban beneficiaries are more likely to enroll in MA-PD plans. However, growth in MA-PD enrollment in rural areas contributed to the overall growth in Part D between 2008 and 2011.³⁹

Although, Part D has generally reduced Medicare beneficiaries' financial barriers to medication and their need to forgo or spend less on basic needs in order to afford prescriptions,⁴⁰ the impact of Part D coverage is mixed, particularly among those with higher than average spending. Those with the highest drug spending still paid a substantial portion of their drug costs despite Part D coverage.^{36,38} Among California Medicare beneficiaries with income below 300% of poverty between 2008 and 2010, few were enrolled in the lowest-cost Part D plan and about 20% were identified as eligible for but not receiving the low-income subsidy benefits.⁴¹ For Medicare beneficiaries with chronic conditions, medication discontinuation and out-of-pocket spending were highest among those enrolled in Part D plans with coverage gaps in 2006 and 2007.^{18,42} The ACA is gradually closing the Part D coverage gap.²⁶

Little is Known about Out-of-Pocket Spending for Rural Medicare Beneficiaries

Prior research indicates that rural residents generally report higher out-of-pocket health spending than urban residents. Among the privately insured, rural residents pay a larger portion of their healthcare spending out-of-pocket than urban residents, a difference that may be related to the lower actuarial value of health plans for rural residents.⁴³ Across all ages, rural residents have higher out-of-pocket expenses relative to income, controlling for demographic characteristics and health status, insurance, and employment.²⁴ While these studies have not been specific to those with Medicare, beneficiaries living in rural areas are more likely to lack insurance coverage that supplements Medicare^{44,45} and thus may have more limited protection for out-of-pocket spending. We do know that rural Medicare beneficiaries' prescription drug spending accounted for a higher proportion of out-of-pocket spending than for urban beneficiaries (27% vs. 23%).⁴⁶ Similarly, the proportion of rural Medicare beneficiaries who purchase non-group supplemental coverage is higher than among urban beneficiaries (28% vs. 23%).²⁸ Since these policies are associated with a higher degree of cost-sharing than other

types of supplemental plans,^{12,47} these rural beneficiaries may be more likely to have substantial out-of-pocket spending. This study provides new information about out-of-pocket spending for rural Medicare beneficiaries in an effort to better understand how Medicare cost containment proposals may impact those living in rural areas.

METHODS

This study addresses the following research questions:

- 1) Does out-of-pocket spending for medical care differ for rural and urban Medicare beneficiaries and, if so, to what extent?
- 2) How does out-of-pocket spending vary for different types of services (e.g., hospital inpatient, emergency, and office-based services, prescription drugs, and dental care) and,
- 3) What factors place Medicare beneficiaries at greater risk of high out-of-pocket spending (e.g., rural residence, gender, having no supplemental insurance, being in poor health)?

Data Description

The study uses data from the 2006-2010 Medical Expenditure Panel Survey (MEPS), a nationally representative panel survey conducted by the federal Agency for Healthcare Research and Quality (AHRQ) that contains detailed information on healthcare service use, total costs, and the distribution of costs across different payers including self-pay for a nationally representative sample of community-dwelling U.S. residents. Our pooled analytic file contained nearly 16,700 individuals receiving Medicare, of whom over 4,500 (20%) lived in a rural area.

Study Populations

Limiting our study population to Medicare beneficiaries, we use a combination of bivariate and multivariate analytic techniques to address the research questions. Our preliminary analyses found substantial differences in healthcare use and expenditures between beneficiaries who are non-elderly and disabled and those who are elderly (age 65 and older). For this reason, we conduct separate analyses for elderly Medicare beneficiaries and for the non-elderly subset of individuals covered by Medicare as the result of a disabling condition. Although many elderly

beneficiaries may also have disabling conditions, we refer to the latter group as “disabled beneficiaries” throughout the paper.

Dependent and Independent Variables

The dependent variable for this study is out-of-pocket spending, measured at the individual level in multiple ways, including: total out-of-pocket spending (in inflation-adjusted dollars); total out-of-pocket spending as a proportion of personal income; and, total out-of-pocket spending as a proportion of total healthcare spending. Out-of-pocket spending includes those expenses paid by the user or other family member to hospitals, physicians, other health care providers, and pharmacies for services reported by the respondents in the MEPS; premiums are not included in the out-of-pocket spending calculations. For out-of-pocket spending as a proportion of income, the denominator included total person-level income and was capped at 100% for individuals whose spending was higher than their reported income. Out-of-pocket spending as a proportion of total expenditures (spending from all sources) was the focus of our study, particularly the multivariate analyses, because it provides a relative measurement of individuals’ financial exposure for medical care. This can be helpful for understanding potential financial barriers that beneficiaries may face at the point of healthcare delivery, which may impact healthcare seeking decisions.

Using the Consumer Price Index for All Urban Consumers (CPI-U), we inflate all income and expenditure data to 2011 dollars to allow for comparability across survey years. At the bivariate level, we estimate total out-of-pocket spending as well as spending by type of service, including office-based, hospital inpatient, emergency room, prescription drugs, and dental care. Unlike some prior studies, we do not include premium payments as an out-of-pocket expenditure. Although we examine dental care as a discrete out-of-pocket expense, we exclude its self-pay and third-party expenses from our analysis of total mean out-of-pocket spending because it is not covered by Medicare. Rural-urban residence is our key independent variable, defined using the Office of Management and Budget’s non-metropolitan and metropolitan county designations. Other explanatory variables include enrollment and source of supplemental coverage (i.e., employer-sponsored, individually-purchased, Medicaid, Medicare Advantage, or none).

In addition to the variables discussed above, our analyses include other factors known to affect healthcare use and expenditures to control for differences between rural and urban Medicare beneficiaries and to identify subpopulations at greatest risk of high out-of-pocket spending. These variables include gender, race/ethnicity, health status, census region of residence, education, employment status, family size, income, and marital status.

Statistical Analysis

At the bivariate level, we use paired t-tests of significance to compare average rural and urban out-of-pocket spending in absolute dollars and as a proportion of total spending and family income. Using multivariate models, we assess the relative burden of out-of-pocket spending for rural and urban Medicare beneficiaries. Because the transformation of out-of-pocket spending into a proportion results in a limited continuous variable that is bounded by 0 and 1, we used a generalized linear model (GLM) with a logit transformation of the proportional dependent variable and a binomial.^{48,49} This model, sometimes called a *fractional logit*, accommodates the analysis of proportional variables including the extreme values of 0% and 100% (0 and 1). As a precaution against overstating the statistical significance of our findings, we use options available in Stata (StataCorp LP, College Station, TX) to calculate robust standard errors.

Because the MEPS uses a complex sampling strategy, sampling weights are assigned to each record based on the probability of selection and adjusted for key sociodemographic characteristics. All bivariate statistical tests are calculated using SUDAAN version 11 (Research Triangle Institute, Research Triangle Park, NC) because of its ability to account for sample design parameters and to yield valid standard errors for the weighted data.⁵⁰ Multivariate analyses were conducted in Stata using appropriate techniques for clustered survey data. Findings presented below are significant at the 0.05 level unless otherwise stated.

FINDINGS

Characteristics of Medicare Beneficiaries by Residence and Eligibility Category

In the years 2006-10, about 20% of community-dwelling Medicare beneficiaries live in the rural U.S. (Table 1). Compared to urban beneficiaries, a larger proportion of rural beneficiaries are male, White, not Hispanic, and in fair or poor physical health. Both rural and urban beneficiaries age 65 and older (elderly beneficiaries) are more likely to be in excellent or very

good / good health compared to beneficiaries under age 65 (disabled beneficiaries). Reflecting Medicare eligibility criteria for persons under 65, more than half the disabled beneficiaries are in fair or poor health status, regardless of residence. Rural beneficiaries are more likely to be married than their urban counterparts and, correspondingly, are more likely to live in families with two or more persons, a finding pronounced among the disabled population. Like rural residents generally,⁵¹⁻⁵³ rural Medicare beneficiaries are more likely to have a lower educational attainment and lower income than urban beneficiaries, again, a finding more prevalent among disabled beneficiaries.

Sources of supplemental Medicare coverage also vary among rural and urban Medicare beneficiaries. Compared to urban beneficiaries, rural elderly and disabled beneficiaries are more likely to go without any type of supplemental coverage.[‡] Additionally, elderly rural beneficiaries are more likely to have an individually purchased plan (i.e., Medigap) than their urban counterparts (19.2% vs. 14.9%) and are less likely to have a Medicare Advantage plan (15.5% vs. 25%). Though roughly one-third of all elderly Medicare beneficiaries have an employer-sponsored plan, only one-fifth of disabled beneficiaries have this type of supplement. Elderly rural beneficiaries are less likely to have dental benefits than those in urban areas (11.5% vs. 17.4%). Rural disabled beneficiaries are also less likely to have dental benefits than urban, though this finding does not achieve statistical significance (8.8% vs. 12.8%; $p \leq .06$).

Annual Medicare Out-of-Pocket Spending by Residence

Among Medicare beneficiaries with healthcare spending between 2006 and 2010, rural disabled beneficiaries have lower mean out-of-pocket spending compared to rural elderly beneficiaries and to all urban beneficiaries (Table 2). Regardless of residence, disabled beneficiaries spend about 10% of their income on out-of-pocket expenses[§] compared to less than 6% for elderly beneficiaries. While average out-of-pocket spending in absolute dollars is lower for rural disabled beneficiaries than for urban (\$943 versus \$1,129), those in rural areas are responsible for nearly 18% of their healthcare spending, compared to about 14% in urban areas.

[‡]See the *Limitations* section for a discussion of the challenges inherent in assigning supplemental coverage types to MEPS respondents.

[§] Premiums are excluded from out-of-pocket spending calculations.

Among elderly beneficiaries, we find no significant rural-urban differences in mean out-of-pocket spending in dollars, or in out-of-pocket spending as a proportion to income or total healthcare costs.

Elderly rural beneficiaries have significantly lower out-of-pocket spending for office visits compared to those in urban areas (\$163 vs. \$229). This may be explained, at least in part, by the fact that rural beneficiaries tend to have fewer office-based visits than their urban counterparts. There is no significant difference by residence in the percentage of office-based visit spending that is paid out-of-pocket among disabled or elderly beneficiaries.

Elderly beneficiaries are more likely to use prescription medication than disabled beneficiaries, and the rural elderly have a higher mean number of prescriptions filled and refilled each year as well as higher mean prescription out-of-pocket spending compared to those in urban areas. The rural elderly also pay a higher proportion of their total prescription drug spending compared to urban elderly beneficiaries (38.3% vs. 35.1%).

Regardless of residence, a larger proportion of elderly beneficiaries have at least one dental visit compared to disabled beneficiaries. Elderly rural beneficiaries are less likely to receive any dental care (40.5% vs. 46.5%) and have fewer average annual visits (1.00 vs. 1.23) compared to elderly urban beneficiaries. Average dental out-of-pocket spending is lower for rural beneficiaries than urban for both eligibility groups, though elderly rural beneficiaries are responsible for a higher portion of their total dental spending than those in urban areas (75% vs. 67.8%).

Percent of Spending Paid Out-of-Pocket: Residence and Beneficiary Characteristics

Table 3 compares the average percent of total medical spending that is paid out-of-pocket for disabled and elderly beneficiaries by residence and beneficiary characteristics most likely to affect expenses. As one would expect, beneficiary differences in supplemental insurance coverage are related to differences in the percent of spending that is paid out-of-pocket versus by a third-party insurer. For example, across residence and eligibility group, beneficiaries with Medicaid coverage paid the lowest percentage of their total spending themselves compared to other coverage categories (from 5% to 9% depending on eligibility/residence group).

Reflecting prior research,^{3,44} across rural and urban residence and eligibility categories,

beneficiaries with Medicare-only (no supplemental plan) pay a higher proportion of their medical costs themselves – about one-quarter of this spending.

Rural disabled Medicare beneficiaries pay a higher proportion of their total spending themselves than do urban beneficiaries when they are female, white, in fair or poor health, married, have less than a high school education, or have income between 100-199% or 200%+ of poverty. Additionally, rural disabled beneficiaries pay relatively more than their urban counterparts when they have no supplemental coverage or when they have Medicaid. Among these rural beneficiaries, those without any supplemental coverage pay nearly 30% of their spending out-of-pocket, the largest percentage we found when examining supplemental coverage status and type. Among disabled beneficiaries with Medicaid, those in rural areas pay more than 7% of their medical spending themselves, compared to only 5% in urban areas. Rural-urban differences among disabled beneficiaries with other types of supplemental coverage are not significantly different.

Rural elderly beneficiaries pay a higher proportion of their spending out-of-pocket than urban beneficiaries when they are female, in very good or good physical health, or have less than a high school education. Elderly beneficiaries who are employed pay a large share of their spending out-of-pocket compared to those who are not employed, and the mean percent paid out-of-pocket among the employed elderly is higher for rural than urban beneficiaries (28.9% vs. 25.8%).

Multivariate Analyses of Factors Associated with High Out-of-Pocket Spending

Given the observed differences between the elderly versus disabled Medicare populations identified by our bivariate comparisons, we elected to model each age group separately. Findings from each model are presented in Table 4 as rate ratios, where a value over 1 indicates that the characteristic is associated with a relatively higher proportion of spending paid out-of-pocket and a value less than 1 indicates a lower relative proportion. The findings from the GLM regressions generally reflect the bivariate findings. For example, among both elderly and disabled beneficiaries, having supplemental insurance coverage is associated with a lower proportion of total spending paid out-of-pocket compared to having Medicare alone. This is particularly true for those with Medicaid coverage (dual eligibles). Among elderly

beneficiaries, the proportion of total spending paid out-of-pocket is 73% lower among the dually eligible compared to seniors without any supplemental coverage.

Among elderly beneficiaries, being female is associated with higher out-of-pocket burden, even controlling for age, income and supplemental coverage. Elderly adults in poor health have the lowest out-of-pocket spending burden as a proportion of total spending compared to other health statuses; those in excellent health pay 42% more of their healthcare expenses out-of-pocket and those in very/good health pay 24% more. While this may seem counterintuitive, it likely reflects lower cost-sharing requirements for catastrophic care (major surgeries, cancer treatment, etc.) compared with ambulatory care.

Compared to the elderly living in poverty, those with higher incomes pay a higher proportion of total spending themselves. This may appear counterintuitive, particularly since the model controls for supplemental coverage, but may reflect better access to services for higher income adults. Impoverished seniors may forgo care for which they would have substantial out-of-pocket burden, while those with higher income are better positioned to afford this care.

Controlling for income, supplemental coverage, socio-demographic and regional characteristics, rural elderly beneficiaries do not experience a significant difference from their urban counterparts in the proportion of total healthcare expenditures they pay out-of-pocket. In contrast, however, rural residence is a significant predictor of higher out-of-pocket burden among the disabled population. For this group, rural residents pay a 40% higher proportion of their total spending compared to urban residents. While it does not eliminate rural-urban differences in spending burden, supplemental insurance status remains an important predictor of out-of-pocket spending. As seen among elderly beneficiaries, each type of supplemental coverage reduces individuals' proportion of out-of-pocket spending compared to having no supplemental coverage, with the dually eligible experiencing the lowest relative burden. Among disabled beneficiaries, those with Medicaid coverage have 81% lower out-of-pocket spending as a proportion of total spending compared with Medicare-only beneficiaries. With the exception of excellent health status, no other characteristics have a significant independent impact on out-of-pocket spending burden for this eligibility group.

LIMITATIONS

Our study has some key limitations that may affect the generalizability of findings. First, because MEPS is a survey of community-dwelling adults, we lack any information about Medicare beneficiaries living in institutional settings. However, the inclusion of spending patterns for long term services and supports (as well as ambulatory medical care received in these settings) would significantly alter our ability to evaluate patterns of out-of-pocket spending for health services used by community dwelling beneficiaries, the largest segment of the Medicare population.

A final limitation of our analyses is that estimates of supplemental insurance coverage from the MEPS do not match those from other sources such as the Medicare Current Beneficiary Survey (MCBS). Specifically, the rate of Medicare-only coverage in MEPS is higher for both aged and disabled populations in MEPS compared to the MCBS. For example, using MEPS we found that 19% of the total community-dwelling Medicare population had no supplemental coverage compared to 11% found in an analysis of the 2007 MCBS.⁵⁴ This 8-percentage point difference generally reflects lower rates of each type of supplemental coverage, with the exception of Medicare Advantage, including: 33% versus 36% for employer-sponsored; 14% versus 18% for individually purchased; and 11% versus 12% for Medicaid. The likely impact of this difference is that our models under-control for the protective influence of supplemental coverage, as some beneficiaries may be inaccurately included in the reference group of Medicare-only. Given that rural residents are more likely to lack supplemental coverage, the models may slightly overstate rural-urban differences. However, given the very close estimates for Medicaid coverage between MEPS and MCBS and the high rate of Medicaid coverage among the disabled population, any undercount of supplemental coverage should bias estimates of rural spending disparities for those under age 65.

POLICY IMPLICATIONS

Our findings provide new information about the rates of out-of-pocket spending among rural Medicare beneficiaries. Among elderly beneficiaries (over age 65), we find limited rural-urban differences in the proportion of total spending that is paid directly by beneficiaries and/or their families. For the Medicare elderly population overall, about 20% of total spending is paid out-

of-pocket, and there is no significant difference based on residence. These findings are supported by multivariate analyses which also show no significant differences by residence when controlling for supplemental coverage and other characteristics.

When looking at out-of-pocket spending for different categories of expenditures, rural and urban elderly Medicare beneficiaries generally look the same. The two exceptions are dental care and prescription drugs. While dental expenditures are excluded from our analyses of total out-of-pocket spending, we explored this spending individually and found that the rural elderly are less likely to have a dental care visit, have fewer visits, and pay a higher proportion of their dental expenditures themselves (75% versus 68% for the urban elderly). Further research is needed to determine the extent to which the lower use of dental services by rural Medicare beneficiaries is driven by financial barriers stemming from more limited third-party coverage and/or other factors.

In contrast to their urban counterparts, rural elderly beneficiaries are equally likely to have any prescription drug use (92%), but have a higher number of prescriptions, higher out-of-pocket spending for prescriptions, and higher out-of-pocket spending for these medications relative to total prescription costs. This likely reflects the fact that rural elderly are less likely to have coverage for prescription drugs than are urban elderly. Given that prior research has shown that there are differences in out-of-pocket protection between different prescription drug plans, even among beneficiaries with coverage,^{36,38} rural residents may face different levels of cost-sharing than those in urban areas. Because use of prescription drugs is particularly sensitive to costs, this may mean that rural elderly are at risk of inadequate compliance with prescribed medication regimens. Prior studies indicate that when faced with out-of-pocket spending that exceed certain thresholds, older adults with poor health status or a chronic illness used less of their medication than prescribed.¹⁸ Additionally, they may cut back on basic needs, or use borrowed money and/or credit to pay for prescriptions,¹⁶ meaning that rural elderly may be vulnerable to financial risk from out-of-pocket spending for medications.

Among the disabled Medicare population, we see substantially different patterns of out-of-pocket spending among those in rural and urban areas and when compared to older beneficiaries and for rural and urban beneficiaries. While rural disabled beneficiaries pay a smaller proportion of their total expenditures themselves than do rural elderly beneficiaries

(18% versus 22%), they pay a higher proportion of their total income for care (10% versus 6%). This reflects the fact that that, while mean out-of-pockets expenses are somewhat lower for older Medicare beneficiaries, more than one third of the rural disabled Medicare population lives in poverty. In addition to needing to spend more of their total financial resources on healthcare, non-elderly disabled beneficiaries are more likely to experience access barriers including transportation, not getting appointments, or difficulty finding medical providers than elderly beneficiaries.³¹ Our findings, combined with prior studies, confirm that regardless of residence, disabled beneficiaries face greater financial and non-financial barriers to care than do their elderly counterparts.

Among disabled Medicare beneficiaries, we identify important rural-urban differences in out-of-pocket healthcare spending. At the bivariate level, actual dollar costs paid out-of-pocket are lower for those in rural areas, yet the proportion of total spending paid out-of-pocket is significantly higher (18% vs 14% for urban). This bivariate difference is likely driven, in part, by the fact that rural disabled beneficiaries are more likely to lack supplemental coverage than are their urban counterparts (29% versus 21%). However, even controlling for presence and source of supplemental insurance in the multivariate model, a large and significant rural-urban difference persists such that disabled rural residents, on average, are paying 40% more of their total spending out-of-pocket relative to those in urban areas.

The fact that rural-urban differences in relative out-of-pocket spending among disabled beneficiaries remain after controlling for coverage suggests a smaller protective effect from supplemental coverage among those in rural versus urban areas. This conclusion is supported by the fact that, at the bivariate level, we find that dually eligible rural beneficiaries with disabilities (covered by Medicare and Medicaid) pay a larger proportion of their total spending out-of-pocket versus urban beneficiaries (7% versus 5%). Given that such a large segment of disabled Medicare beneficiaries have Medicaid (about 40%), this may account for much of the observed rural-urban difference in the disabled Medicare population. In general, Medicaid provides substantial protection against high personal healthcare expenditures among individuals with disabilities compared to other sources of supplemental coverage. One analysis found that out-of-pocket spending is more than twice as high for non-elderly disabled beneficiaries without Medicaid than for those who are dually-eligible, with particularly high spending among those with two or more ADLs or severe mental illness.³⁴ However, states vary considerably in

the level of coverage they provide for individuals in this eligibility group, and the types of services that are covered.⁵⁵ Our findings suggest that rural residents are more likely to live in states with more limited benefits for the non-elderly, dually eligible than are urban residents.

This study indicates that rural Medicare beneficiaries face some significant disparities in spending burden for medical care when compared to urban beneficiaries. While elderly beneficiaries showed little difference in out-of-pocket spending based on residence, the findings related to prescription drug spending indicate the need to monitor access to medications and the financial impact of drug coverage for rural elderly Medicare beneficiaries. For the disabled population, our findings suggest that rural Medicare beneficiaries are at risk of being unable to afford needed services, and the potential health impacts of higher out-of-pocket spending may exacerbate rural-urban health disparities for a particularly vulnerable population. Additional analyses are needed to understand the full consequences of this burden for the rural disabled, and the policy actions that may be taken to improve access and limit financial risk for this population.

Finally, in addition to the limitations identified above, it is also likely that we have not fully captured the out-of-pocket spending that may be borne by rural Medicare beneficiaries. For example, Hwang et al⁵⁶ suggest that, in addition to copayments and premiums (including Part B, Part D, and supplemental insurance premiums), out-of-pocket spending for persons with chronic illness may include travel expenses, specialized clothing, adjustments to the home, and phone bills. Some of these, such as travel and phone calls to distant specialists, may be particularly costly for rural residents and yet not captured in our analyses. Further research is necessary to identify the extent to which these non-medical expenditures may be a burden for rural beneficiaries and hinder their access to and use of needed healthcare resources.

TABLES

Table 1. Characteristics of Community-Dwelling Medicare Beneficiaries by Eligibility Group and Residence, 2006-10

Characteristics	Rural 20% (n=4,517)		Urban 80.0% (n=16,677)	
	Disabled	Elderly	Disabled	Elderly
Male	53.1 ^{p=.07,b}	44.7 ^{p=.06,b}	47.6 ^{p=.07,b}	42.7 ^{p=.06,b}
Female	46.9	55.3	52.4	57.3
Race				
White, not Hispanic	77.7 ^{a,b}	88.6 ^{a,b}	61.6 ^{a,b}	77.8 ^{a,b}
Not White, Not Hispanic	17.6	8.5	26.4	14.3
Hispanic	4.7	2.9	12.0	7.8
Physical health status				
Excellent	6.1 ^b	16.8 ^b	9.9 ^b	17.6 ^b
Very good / good	39.3	58.2	35.6	59.9
Fair / poor	54.6	25.0	54.5	22.6
Married	45.7 ^{a,b}	57.4 ^{a,b}	37.0 ^{a,b}	53.4 ^{a,b}
Not married	54.4	42.6	63.0	46.6
Family size				
One person	24.9 ^{a,b}	30.4 ^{a,b}	31.1 ^{a,b}	32.2 ^{a,b}
Two persons	41.5	58.8	32.0	54.4
Three or more persons	33.6	10.8	36.9	13.4
Education				
Less than high school	34.7 ^{a,b}	30.0 ^{a,b}	24.5 ^{a,b}	23.0 ^{a,b}
High school or some college	40.7	37.4	41.6	34.2
College degree	24.6	32.5	33.9	42.8
Poverty status				
< 100% FPL	35.7 ^{a,b}	12.4 ^{a,b}	30.6 ^{a,b}	8.7 ^{a,b}
100-199% FPL	32.3	27.9	28.2	24.5
200%+ FPL	32.0	59.6	41.3	66.8
Employed	15.1	17.9	17.7	18.7
Not employed	84.9	82.1	82.3	81.3
Region				
Northeast	11.0 ^a	13.6 ^a	20.0 ^{a,p=.06}	21.3 ^{a,p=.06}
Midwest	24.7	29.7	21.5	20.3
South	51.8	42.8	39.0	35.6
West	12.5	13.9	19.5	22.8
Supplemental Coverage				
Employer-sponsored	18.1 ^{a,b}	31.6 ^{a,b}	20.3 ^{a,b}	35.8 ^{a,b}
Individually purchased (Medigap)	4.1	19.2	4.3	14.9
Medicaid	39.1	7.2	37.0	8.0
Medicare Advantage	9.7	15.5	17.4	25.0
Medicare-only	29.0	26.6	21.0	16.4
Prescription drug coverage through private plan or Part D	80.2 ^b	66.4 ^{a,b}	78.5 ^b	71.9 ^{a,b}
Dental benefits	8.8 ^{p=.06}	11.5 ^a	12.8 ^{p=.06,b}	17.4 ^{a,b}

^a Residence differences significant at $p \leq .05$. ^b Differences between elderly and disabled eligibility groups significant at $p \leq .05$. Estimates are weighted to population level using weights provided with the MEPS. Sample size is unweighted.

Table 2. Mean Annual Out-of-Pocket Spending for Community-Dwelling Medicare Beneficiaries by Eligibility Group and Residence, 2006-10

Characteristics	Rural 20% (n=4,517)		Urban 80.0% (n=16,677)	
	Disabled	Elderly	Disabled	Elderly
Mean total out-of-pocket spending	\$942.58 ^{a,b}	\$1,193.09 ^b	\$1,128.64 ^a	\$1,151.30
Mean out-of-pocket spending as percent of income	9.9% ^b	6.0% ^b	9.1% ^b	5.4% ^b
Mean out-of-pocket spending as percent of health expenditures	17.7% ^{a,b}	22.3% ^b	13.8% ^{a,b}	21.4% ^b
Office-based visits				
Percent with an office visit	87.2% ^b	92.3% ^b	88.8% ^b	92.5% ^b
Mean number of visits	10.9 ^a	9.3 ^a	13.0 ^{a,b}	10.7 ^{a,b}
Mean office visit out-of-pocket spending	\$183.54	\$163.10 ^a	\$182.49 ^b	\$229.30 ^{a,b}
Mean office visit OOP spending as percent of total office visit spending	12.5%	13.3%	10.8% ^b	13.9% ^b
Hospital inpatient visits				
Percent with an inpatient stay	15.9%	17.3%	18.4%	17.2%
Mean number of inpatient days	0.26	0.26	0.29	0.25
Mean inpatient out-of-pocket spending	\$185.75 ^{p=.07}	\$302.52 ^{p=.07}	\$263.36	\$300.91
Mean inpatient OOP spending as percent of total inpatient spending	1.79%	2.78%	1.95%	2.37%
Emergency room visits				
Percent with an ER visit	21.7% ^a	18.7%	26.0% ^{a,b}	18.1% ^b
Mean ER out-of-pocket spending	\$25.70 ^b	\$50.65 ^b	\$42.48	\$62.11
Mean ER OOP costs as percent of total ER spending	3.4% ^b	6.2% ^b	4.3% ^b	6.1% ^b
Prescription drugs				
Percent with an Rx use	85.1% ^b	92.1% ^b	85.8% ^b	92.0% ^b
Mean number of prescriptions (includes refills)	41.7	33.4 ^a	41.6	29.1 ^a
Mean Rx out-of-pocket spending	\$602.17 ^{p=.06,b}	\$758.57 ^{a,b}	\$712.24 ^{p=.06}	\$664.49 ^a
Mean Rx OOP spending as percent of total Rx spending	24.5% ^b	38.3% ^{a,b}	22.8% ^b	35.1% ^{a,b}
Dental care				
Percent with a dental visit	26.3% ^b	40.5% ^{a,b}	29.4% ^b	46.5% ^{a,b}
Mean number of visits	0.71 ^b	1.00 ^{a,b}	0.75 ^b	1.23 ^{a,b}
Mean dental out-of-pocket spending	\$225.30 ^{a,b}	\$509.78 ^{p=.06,b}	\$419.48 ^{a,b}	\$604.63 ^{p=.06,b}
Mean dental OOP spending as percent of total dental spending	38.9% ^b	75.0% ^{a,b}	41.9% ^b	67.8% ^{a,b}

^a Residence differences significant at $p \leq .05$.

^b Differences between elderly and disabled eligibility groups significant at $p \leq .05$.

Estimates are weighted to population level using weights provided with the MEPS. Sample size is unweighted.

Mean total out-of-pocket spending excludes dental expenses. Out-of-pocket spending includes the amount paid for medical services by a person or family; it is calculated only for those who used that service and exclude premiums. All expenditure and income data are inflated to 2011 dollars using the Consumer Price Index.

Table 3. Mean Percent Out-of-Pocket Spending of Community-Dwelling Medicare Beneficiaries by Characteristics, Eligibility Group and Residence, 2006-10

Characteristics	Rural 20% (n=4,517)				Urban 80.0% (n=16,677)			
	Disabled	Significant Pairwise Comparisons	Elderly	Significant Pairwise Comparisons	Disabled	Significant Pairwise Comparisons	Elderly	Significant Pairwise Comparisons
Male	18.16		20.99	c	14.60 ^b		21.23 ^b	
Female	17.12 ^{a,b}		23.37 ^{a,b}	c	13.07 ^{a,b}		21.58 ^{a,b}	
Race								
White, not Hispanic (1)	18.55 ^{a,b}	(1,3) ^c	22.70 ^b	(1,2) ^c	15.11 ^{a,b}	(1,3) ^c	22.08 ^b	(1,2) ^c
Not White, Not Hispanic (2)	15.03		18.95		11.29 ^b		19.45 ^b	(1,3) ^c
Hispanic (3)	10.47 ^b		19.83 ^b		12.14 ^b		18.40 ^b	
Physical health status								
Excellent (1)	15.47 ^b		26.79 ^b	(1,2) ^c	13.16 ^b		25.96 ^b	(1,2) ^c
Very good / good (2)	21.11 ^a		23.25 ^a	(1,3) ^c	14.81 ^{a,b}		21.84 ^{a,b}	(1,3) ^c
Fair / poor (3)	16.06 ^a	(2,3) ^c	17.31	(2,3) ^c	13.28 ^{a,b}		17.00 ^b	(2,3) ^c
Married	20.09 ^{a,b}		23.48 ^b	c	16.20 ^{a,b}	c	22.22 ^b	c
Not married	16.07		20.76	c	12.43 ^b	c	20.53 ^b	c
Family size								
One person (1)	13.75 ^b	(1,2) ^c	21.39 ^b	(2,3) ^c	12.30 ^b	(1,2) ^c	20.75 ^b	(1,2) ^c
Two persons (2)	18.58 ^b		23.17 ^b		15.96 ^b	(2,3) ^c	21.84 ^b	
Three or more persons (3)	19.56		20.13		13.14 ^b		21.38 ^b	
Education								
Less than high school (1)	17.24 ^a		21.04 ^a		11.03 ^{a,b}	(1,2) ^c	19.01 ^{a,b}	
High school or some college (2)	18.74		22.77		14.17 ^b	(1,3) ^c	21.68 ^b	
College degree (3)	17.39 ^b		22.95 ^b		15.48 ^b		22.50 ^b	
Poverty status								
< 100% FPL (1)	13.39 ^b	(1,2) ^c	18.09 ^b	(1,2) ^c	10.39 ^b	(1,2) ^c	16.20 ^b	(1,2) ^c
100-199% FPL (2)	17.12 ^{a,b}	(1,3) ^c	21.69 ^{a,b}	(1,3) ^c	12.66 ^{a,b}	(1,3) ^c	19.62 ^{a,b}	(1,3) ^c
200%+ FPL (3)	22.66 ^a	(2,3) ^c	23.48		17.00 ^{a,b}	(2,3) ^c	22.76 ^b	(2,3) ^c
Employed	13.51 ^{a,b}		28.90 ^{a,b}	c	14.65 ^{a,b}		25.81 ^{a,b}	c
Not employed	18.58		20.91	c	13.69 ^b		20.44 ^b	c

Table 3. Mean Percent Out-of-Pocket Spending of Community-Dwelling Medicare Beneficiaries by Characteristics, Eligibility Group and Residence, 2006-10

Characteristics	Rural 20% (n=4,517)				Urban 80.0% (n=16,677)			
	Disabled	Significant Pairwise Comparisons	Elderly	Significant Pairwise Comparisons	Disabled	Significant Pairwise Comparisons	Elderly	Significant Pairwise Comparisons
Region								
Northeast (1)	23.84		22.60		11.98 ^b	(1,3) ^c	20.07 ^b	(1,3) ^c
Midwest (2)	16.46		21.52		12.84 ^b		21.27 ^b	(1,4) ^c
South (3)	17.26 ^b		22.47 ^b		15.01 ^b		22.06 ^b	
West (4)	16.56		23.24		14.18 ^b		21.87 ^b	
Supplemental Coverage								
Employer-sponsored (1)	18.58	(1,3) ^c	20.69	(1,2) ^c	16.60 ^b	(1,3) ^c	20.98 ^b	(1,3) ^c
Individually purchased (Medigap) (2)	13.19 ^b	(1,5) ^c (2,3) ^c	24.44 ^b	(1,3) ^c (1,5) ^c	19.21	(1,5) ^c (2,3) ^c	23.81	(1,4) ^c (1,5) ^c
Medicaid (3)	7.39 ^a	(2,4) ^c	9.17	(2,3) ^c	4.94 ^{a,b}	(3,4) ^c	7.57 ^b	(2,3) ^c
Medicare Advantage (4)	23.23	(2,5) ^c	23.11	(3,4) ^c	18.43	(3,5) ^c	22.23 ^b	(2,4) ^c
Medicare-only (5)	29.65 ^a	(3,4) ^c (3,5) ^c	25.97	(3,5) ^c (4,5) ^c	21.64 ^{a,b}		25.91 ^b	(2,5) ^c (3,4) ^c (3,5) ^c (4,5) ^c

^a Within elderly/disabled eligibility group and characteristic, residence differences significant at $p \leq .05$.

^b Within residence and characteristic, elderly/disabled eligibility group differences at $p \leq .05$.

^c Within elderly/disabled eligibility group and residence, characteristic differences significant at $p \leq .05$.

Estimates are weighted to population level using weights provided with the MEPS. Sample size is unweighted. All expenditure data are inflated to 2011 dollars using the Consumer Price Index. Out-of-pocket spending excludes dental costs.

Table 4. Characteristics Associated with the Proportion of Total Expenditures Paid Out-of-Pocket, 2006-10

Characteristic (Referent)	Under Age 65 Ratio (Standard Error)	Age 65 and Over Ratio (Standard Error)
Residence (Urban)		
Rural	1.40 (.128) ***	1.04 (.037)
Age	1.00 (.004)	0.99 (.002) ***
Gender (Male)		
Female	0.99 (.070)	1.10 (.029) ***
Race/Ethnicity (White, not Hispanic)		
Not White, not Hispanic	0.85 (.075)	1.02 (.038)
Hispanic	0.96 (.138)	1.05 (.052)
Health Status (Fair/Poor)		
Excellent	1.34 (.135) **	1.42 (.042) ***
Very good/good	1.17 (.100)	1.24 (.037) ***
Married (No spouse)	1.02 (.099)	0.95 (.027)
High School Graduate Plus (< High School)	1.12 (0.99)	0.97 (.032)
Poverty Status (Income < 100% FPL)		
100-199% FPL	0.99 (.088)	1.10 (.048) *
200% FPL or higher	1.17 (.123)	1.22 (.049) ***
Region (Northeast)		
Midwest	0.96 (.134)	1.01 (.044)
South	1.01 (.114)	1.08 (.041)
West	1.13 (.162)	1.12 (.052) *
Supplemental Coverage (Medicare only)		
Employer sponsored	0.60 (.072) ***	0.72 (.030) ***
Individually purchased	0.68 (.098) **	0.85 (.037) ***
Medicaid	0.19 (.022) ***	0.27 (.018) ***
Medicare Advantage	0.75 (.079) **	0.79 (.034) ***

NOTE: Estimates are based on a fractional logistic regression model with reference categories included in parentheses. Differences significant at *p ≤ .05; **p ≤ .01; ***p ≤ .001.

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- WP58. Gale J.A., Croll Z., & Hartley D. (2015). *Adoption and Use of Electronic Health Records by Rural Health Clinics: Results of a National Survey*.
- WP57. Gale, J.A., Croll, Z., Hartley, D. (2015, January). *Rural Health Clinic Readiness for Patient-Centered Medical Home Recognition: Preparing for the Evolving Healthcare Marketplace*.
- WP56. Published as Talbot, J.A., Ziller, E.C., Lenardson, J.D., Hartley, D. (2014, May). *Implications of Rurality and Psychiatric Status for Diabetic Preventive Care Use among Adults with Diabetes*, Research & Policy Brief.
- WP55. Lenardson, J.D., Ziller, E.C., Coburn, A.F. (2014, May). *High Deductible Health Insurance Plans in Rural Areas*.
- WP54. Griffin, E., Coburn, A.F. (2014, May). *Integrated Care Management in Rural Communities*.
- WP53. Published as Ziller, E.C. (2014, March). *Health Insurance Coverage of Low-Income Rural Children Increases and is More Continuous Following CHIP Implementation*, Research & Policy Brief.
- WP52. Gale, J., Hartley, D., Croll, Z. (2014, February). *Meaningful use of Electronic Health Records by Rural Health Clinics*.
- WP51. Published as Lambert, D., Gale, J., Hansen, A.Y., Croll, Z., Hartley, D. (2013, December). *Telemental Health in Today's Rural Health System*. Research & Policy Brief.
- WP50. Talbot, J.A., & Coburn, A.F. (2013, March). *Challenges and Opportunities for Improving Mental Health Services in Rural Long-Term Care*.
- WP49. Anderson, N., Neuwirth, S., Lenardson, J.D., Hartley, D. (2013, June). *Patterns of Care for Rural and Urban Children with Mental Health Problems*.
- WP48. Gale, J.A., Lenardson, J.D., Lambert, D., Hartley, D. (2012). *Adolescent Alcohol Use: Do Risk and Protective Factors Explain Rural-Urban Differences?*
- WP47. Published as Ziller, E.C., Lenardson, J.D., & Coburn, A.F. (2012). Healthcare access and use among the rural uninsured. *Journal of Healthcare for the Poor and Underserved*, 23(3):1327-1345.
- WP46. Anderson, N., Ziller, E., Race, M., Coburn, A., (2010) *Impact of Employment Transitions on Health Insurance Coverage of Rural Residents*.
- WP45. Lenardson, J., Ziller, E., Lambert, D., Race, M., Yousefian, A. (2010) *Access to Mental Health Services and Family Impact of Rural Children with Mental Health Problems*.
- WP44. Hartley, D., Gale, J., Leighton, A., & Bratesman, S. (2010). *Safety net activities of independent Rural Health Clinics*.
- WP43. Gale, J., Shaw, B., Hartley, D., & Loux, S. (2010). *The Provision of Mental Health Services by Rural Health Clinics*.
- WP42. Race, M., Yousefian, A., Lambert, D., & Hartley, D. (2010). *Mental Health Services in Rural Jails*.
- WP41. Lenardson, J., Race, M., & Gale, J.A. (2009, December). *Availability, Characteristics, and Role of Detoxification Services in Rural Areas*.
- WP40. Ziller, E., Anderson, N.J., Coburn, A.F., & Swartz, J. (2008, November). *Access to Rural Mental Health Services: Service Use and Out-Of-Pocket Costs*.
- WP39. Lambert, D., Ziller, E., Lenardson, J. (2008). *Use of Mental Health Services by Rural Children*.

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