

Rural Health Care Costs: Are They Higher and Why Might They Differ from Urban Health Care Costs?

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Do health care costs differ between rural and urban populations, and if so, why might that be? Rural Americans are more vulnerable than their urban counterparts, which could lead us to suspect rural health care costs are higher. However, the answer may differ depending on how costs are measured and who is paying.

Recently, interest in the health of rural populations has increased in policy circles, both at the national and North Carolina level. However, this recent interest belies a longer interest in rural health policy, largely historically framed around issues of access and equity. Although the increase in the rate of rural hospital closures is one contributor, other policy issues—for example, the increase in suicides and the opioid crisis—are also more pronounced in rural communities. Federal policy has often struggled to reconcile, or has flat out ignored, fundamental issues facing rural health care delivery. For example, the 1983 introduction of Medicare's Prospective Payment System relied on average costs of delivery calculated for larger, urban hospitals and did not account for the higher fixed costs associated with lower volumes faced by rural hospitals. As a result, Medicare reimbursement was insufficient to cover the costs of care in low volume (rural) hospitals, and the late 1980s and early 1990s saw a marked increase in the number of rural hospital closures across the nation [1]. These closures led to various policies aimed at ensuring sufficient access to care for rural populations.

Although the history of federal health policy in the late part of the 20th century is often framed around access, it ultimately has its roots in costs. Inattention to rural-specific issues led to decreases in access, and decades of Medicare reimbursement policy for inpatient services have attempted to remedy this inequity. While the economics of fixed costs in an inpatient setting are generally straightforward (dividing capital costs across fewer patients means the cost-per-patient is higher), there may be other issues leading to a difference in health care cost per person between urban and rural populations. Rural residents are generally older, have lower income, face more chronic diseases, are more likely to partake in risky behaviors, and are generally in worse health [2].

Somewhat surprisingly, primary care physicians often earn higher salaries in rural areas [3]. Given the generally less-competitive health care markets in rural areas, providers may be able to negotiate higher rates with private insurers due to monopolistic markets. These trends, along with the aforementioned “lower volume” issues, suggest rural communities will have higher health care costs. However, rural residents are more likely to be publicly insured or uninsured, which both lead to (in the short run, at least) lower average expenditures per beneficiary. Likewise, fewer providers—and particularly fewer specialists—practice in rural areas, suggesting that diminished access may inhibit care-seeking behavior for some marginal cases. Of course, these barriers to access may ultimately lead to higher costs. Although rural residents are less likely to have a follow-up visit to an inpatient stay (saving the cost of an office visit), this leads to increased rates of emergency department use, costing thousands [4]. Thus, there are compelling reasons to expect rural costs to be higher.

Measuring Costs

When discussing costs, it is important to be clear about what is being measured, as there are multiple measures one might use for the layman's term “cost.” Whether rural health care costs differ from urban costs likely depends on who is paying and whether the costs are measurable. For example, costs can be evaluated from the standpoint of multiple actors: 1) the patient; 2) the insurer (eg, Medicare, Medicaid, commercial); 3) the provider (eg, hospital, physician); and 4) society at large (eg, taxes, government subsidies).

However, certain costs are not available or measurable. For example, we often cannot determine commercial insurer's costs because the data are not generally publicly available. Other data, especially data incorporating costs beyond the “patient-insurer-provider transaction,” can only be estimated. For instance, we know rural Americans travel

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further for care, and therefore, there is an indirect cost of losing work hours to access health care services. Likewise, a rural resident may need to incur travel costs or spend the prior night at a hotel near the provider for an early morning outpatient procedure, while an urban resident might not.

Even the notion of “costs” is ambiguous. Providers have a sticker price (“charge”) that is usually higher than the actual (eg, net patient revenue, reimbursement, expenditure) amount and may differ from the true “cost” of providing the service. Expenditures are the most commonly available measure, and thus where most research is focused.

Finally, another consideration is *how* we compare. The question, “Does the average rural resident have higher health care expenditures than the average urban resident?” asks whether the expenditures are equal, but an alternative question might be: “If we were to take the average rural resident and move them to an urban location, would they spend more or less?” The latter says, “Let’s adjust for the conditions affecting rural residents (eg, their age, income, sex) that we think might affect expenditures.” Additionally, we might wonder whether costs are higher because prices are higher. Are residents of one group receiving more services, or does each service cost more? These have very different policy solutions.

Analysis

To investigate differences between rural and urban expenditures, we take 2 approaches. First, we use Medicare expenditures as published by the Dartmouth Atlas of Health Care [5]. These data use Centers for Medicare & Medicaid Services (CMS) fee-for-service claims for Medicare Parts A and B recipients from 2014 and are adjusted for age, sex, and race calculated for the average resident of each US county. Here, we define “rural” based on the metropolitan status of the county in 2015. (There are multiple definitions of “rural,” of course, and the definition choice can affect the conclusions.)

Table 1 summarizes the average expenditure, weighted by Medicare beneficiary, for total Medicare expenditure (after

adjusting for age/sex/race) as well as individual services. Overall, rural Medicare beneficiaries spend \$339 (about 3.5%) less than urban beneficiaries. The largest relative differences are for physicians (non-metro is 10% lower) and outpatient services (non-metro is 7.6% higher). Likewise, non-metro expenditures are higher on durable medical equipment but lower on hospice. Thus, among one payer population, after adjusting for demographics (but not health status), rural expenditures are in fact lower than urban.

Within North Carolina, this trend does not hold. Most differences are statistically significant, but if anything, there is a trend toward non-metro residents having higher expenditures. Expenditures are higher on inpatient and outpatient facility-based services but lower on physician services in non-metro areas across North Carolina [5]. Although this suggests regional differences (eg, national rural expenditures are lower because rural residents live in less expensive areas like the Midwest rather than New England), adjusting for region in the national analysis exacerbates the difference.

As a second approach, we use the Medical Expenditure Panel Survey (MEPS), an annual survey sponsored by the Agency for Healthcare Research and Quality, to examine the differences in “expenditure” between rural and urban residents. One limitation of this approach is that the MEPS started suppressing metropolitan status in 2013, so the latest data file available is 2012 [6]. We use a Poisson regression, accounting for the complex survey design, to explore the relative (proportional) difference in expenditures as we sequentially adjust for various factors known to affect costs. First, we calculate the simple (relative) difference between total health expenditures among rural and urban residents. In this simple analysis, we find a statistically insignificant estimate that rural residents spend more. We then sequentially adjust for additional factors: age, sex, and race; previous region of the country; previous health insurance status; previous family income; and (for adults) physical and mental health, obesity status, smoking, and diabetes diagnosis (see Figure 1). After adjusting for all these factors, urban residents have 16% higher expenditures, and the result is statistically significant ($P < .05$). Thus, although expenditures appear to be equal, once we account for factors known to affect health care expenditures, rural residents appear to spend less.

Discussion

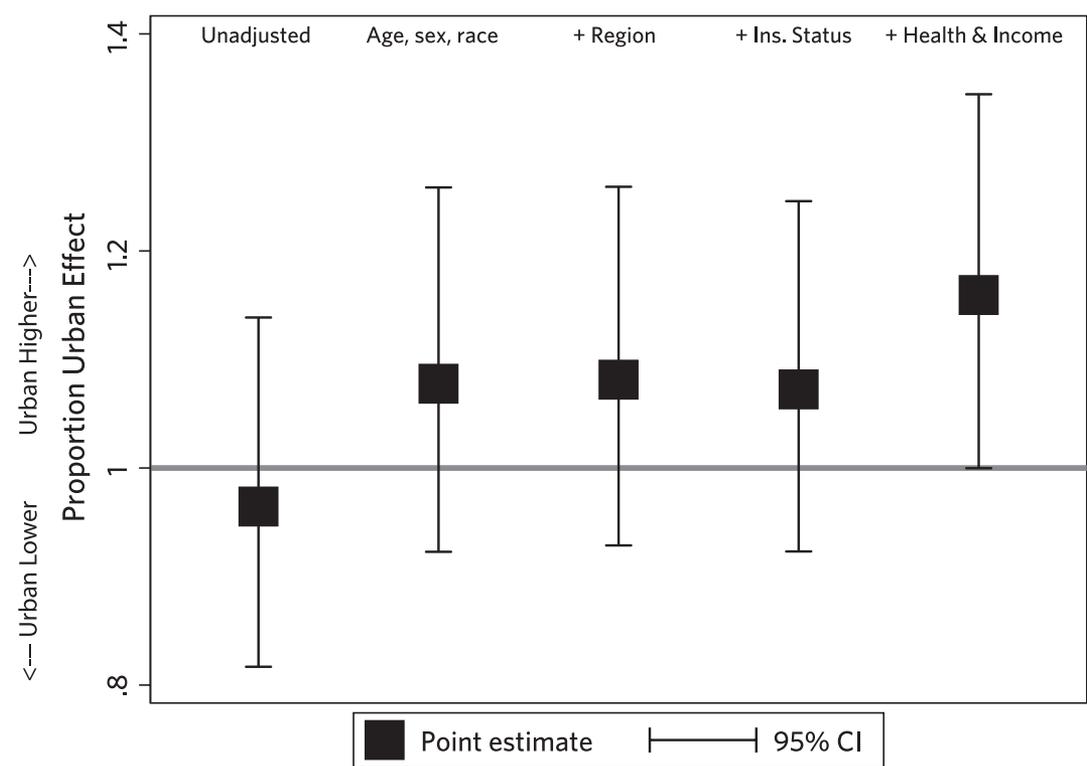
In our analysis, we found mixed results, although there is some evidence that rural health care costs (under some analyses) are lower. Of course, various policies (eg, employer-sponsored insurance, ACA marketplace insurance, Disproportionate Share Hospital [DSH], Controlling Health Plan [CHP], CMS facility fees, and state-recognized telehealth sites of care) may play some role in differential effects between rural and urban areas. Rural Americans are a vulnerable population. Rural communities are, on average, sicker, poorer, and more likely to be unin-

TABLE 1.
Medicare Fee-For-Service Expenditures by Metro/Non-Metro Status, 2014

	Non-Metro	Metro	P-value
Total	\$9,448	\$9,787	<.001
Hospital & SNF	\$4,189	\$4,310	<.001
Physician	\$2,569	\$2,856	<.001
Outpatient	\$1,623	\$1,509	<.001
Home Health	\$522	\$552	<.001
Hospice	\$352	\$379	<.001
Durable Med	\$193	\$177	<.001
N	1999	1147	

Note. All differences statistically significantly at the 5% level. Expenditures adjusted for age/sex/race. Source. Dartmouth Atlas of Health Care [5].

FIGURE 1.
Relative Urban-Rural Difference in Total Health Care Expenditures, Adjusting for Various Factors



Note. CI, confidence interval.
 Source. Authors' calculations from 2012 Medical Expenditure Panel Survey [6].

sured or underinsured [2, 7, 8], engage in risky behaviors such as cigarette smoking or physical inactivity, and report worse physical and mental health [9]. Rural Americans also must travel further to access health care, which is associated with lower levels of receiving care [10]. These demographic differences are associated with the bulk of different policy effects on rural versus urban Americans. We now consider how specific policy context might contribute to these differences.

Employer-Sponsored Insurance

Rural Americans benefit less from the employer-sponsored insurance tax exemption (ESI). The ESI is beneficial to many privately-insured Americans because it promotes employer-provided coverage by exempting health insurance premium costs for both employers and employees from federal and state taxes. An adverse result of the ESI is that health care costs and utilization are higher, as employers and employees are willing to spend more on health care to take advantage of the tax benefits. As a tax exemption for privately-employed Americans, the ESI is most beneficial to individuals who are: 1) privately employed and 2) in the highest tax brackets. Consider the current personal income tax brackets, ranging from 10% to 37% [11]. The lowest wage earners will experience a 10% benefit of the health insurance tax exemption. For the highest wage earners, the ben-

efit is nearly 4 times that (37%). Because rural Americans are more likely to be uninsured and earn lower wages [12], the ESI is generally less beneficial to them.

Affordable Care Act Marketplace

Rural residents have fewer plan choices in the Affordable Care Act's (ACA) health insurance Marketplace than urban residents [13]. One driver of this disparity is the difficulty in building provider networks in rural areas [13], but the smaller risk pool also contributes. A 2014 study found rural residents pay more for Marketplace insurance premiums than urban residents [14], and we expect additional components of the Marketplace disproportionately affect rural individual out-of-pocket health care costs [14]. For example, commercial insurers are less likely to provide coverage through the Marketplace in rural counties. Kaiser reports an average of 2.5 insurers participating in metro Marketplaces in 2017 compared to only 2.0 participating in non-metro Marketplaces [15]. Further, many rural counties only have one Marketplace insurer option [15].

A preponderance of prior research suggests less competition in health care is associated with higher prices. A smaller number of plans offered in rural areas is associated with the fact that rural risk pools are financially more unsound and smaller than urban risk pools. Rural adverse selection is related to both rural demographics (eg, a generally sicker

population) and lower rural Marketplace enrollment uptake rates among eligible individuals. Further, of those enrolling in Marketplace plans, residents of more rural states are more likely to enroll in lower-coverage Bronze plans, which cover approximately 60% of total health care costs [16]. This means, generally, we expect rural Americans have higher out-of-pocket costs for care.

ACA, DSH, and CHIP Funding

Under the ACA, Disproportionate Share Hospital (DSH) payments were to be reduced, and the Children's Health Insurance Program (CHIP) was not to be reauthorized until very recently. Currently, both of these changes have been temporarily delayed. DSH payments subsidize costs incurred by hospitals with higher than average Medicare and Medicaid populations [17]. CHIP serves as an important complement to the larger Medicaid program; together these programs provide insurance to approximately 40% of children in the United States [18]. As DSH payments, Medicaid, and CHIP affect a greater proportion of rural Americans [19], the current changes will disproportionately affect rural hospital reimbursement and rural child uninsurance rates.

CMS Facility Fee Reimbursement

Currently, CMS requires the health care provider to be primarily in the business of providing acute inpatient care to bill facility fees, and facility fees provide higher levels of reimbursement. This results in many rural hospitals maintaining acute inpatient beds with low (eg, less than 5 acute beds/day) occupancy to continue billing facility fees [20]. Maintaining this access requires a high level of fixed costs, leading to higher health care costs.

As rural hospitals report lower financial margins than urban hospitals and continue to close, one alternative delivery model is a freestanding emergency department (FED). FEDs are growing in popularity nationally, but the vast majority are either hospital-owned (which allows them to bill facility fees) or are located in suburban areas with favorably high commercially-insured payer mixes.

In 1999, and again in 2015, policymakers considered the issue of facility fee eligibility for rural areas by proposing legislation aimed at changing the eligibility. For example, the 2015 Rural Emergency Acute Care Hospital (REACH) Act proposed Medicare recognize certain eligible FEDs as hospitals, thereby allowing for facility fee reimbursement [21]. However, no changes to facility fee eligibility have been enacted.

State Telehealth Site of Care

Telehealth has the potential to reduce health care costs, particularly for rural Americans. As telehealth grows, CMS continues to update telehealth reimbursement policies, such as expanding the originating site of care. However, state laws must also be updated or the impact of telehealth will be limited. For example, Wisconsin's Medicaid law explicitly

states it will not recognize an emergency room as an originating site of care for telehealth [22], thereby prohibiting telehealth reimbursement for Medicaid services if provided by an emergency department. Alignment with CMS policies might increase access to care in rural areas in a cost-effective manner.

Summary

In today's age of enhanced stewardship of the health care dollar, increased interest has focused on geographic variation in health care costs. Although actors in the health care system are interested in different notions of cost (eg, premiums, expenditures, reimbursement), we find that what we adjust for (if anything) and for what population (eg, everyone, Medicare, privately-insured) is important to compare rural and urban costs. We showed with 2 approaches that a broad view of expenditures found little evidence of higher costs among rural communities; if anything, rural residents spend less than urban residents. NCMJ

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