

Quality Measures and Sociodemographic Risk Factors: The Rural Context

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Key Findings

- Across both rural and urban locations, quality of care is impacted by differences in sociodemographic characteristics, including race/ethnicity, educational status, living arrangements, Medicaid eligibility, gender, and travel time.
- Not all quality outcomes are equally impacted by sociodemographic characteristics, which may necessitate a multifaceted approach to risk-adjustment in research and implementation of quality improvement interventions.
- The associations between sociodemographic characteristics and quality outcomes differ by rurality, providing evidence that it is necessary and important to take geographic context into account in any decisions about risk-adjustment for quality measures.

Purpose

Researchers and policymakers have publicly discussed and debated whether or not to adjust provider quality measures for differences in patient characteristics.¹ Lacking in this discussion, however, is a nuanced understanding of how adjustment should be conducted within a rural context and what impact it might have on patients and providers when quality measures are used for benchmarking and payment. The purpose of this project was to identify how rurality and key sociodemographic variables might affect quality-of-care outcomes and to estimate the potential impact on quality measurement.

Background and Policy Context

Patient sociodemographic characteristics, such as age, gender, race, ethnicity, marital status, language and literacy, income, education, and occupation may influence health outcomes, in turn impacting health care providers' and institutions' performance on quality measures.¹ Some argue that it is unfair for providers to be judged on patient characteristics that are out of their control and that quality measures should be adjusted to reflect sociodemographic differences in patient case-mix. Others argue that doing so could mask disparities in health outcomes and access to quality care for vulnerable populations. In a reversal of its original position, the National Quality Forum (NQF) recently endorsed sociodemographic adjustment of some quality measures under limited conditions, recommending a trial period to test the impact of risk-adjusted measures on quality reporting and patient outcomes.¹⁻²

In addition to the sociodemographic characteristics listed earlier, the NQF suggested adjusting for community variables, such as living environment, community context, and funding for safety net providers, as community factors may impact patient outcomes.³ Many of these community variables are driven by geographic location, making it especially important to consider the role of rurality in quality-adjustment. While the NQF acknowledged that distance to providers is especially important in rural areas,¹ little emphasis was placed on geographic or other community characteristics, such as travel time to providers and the availability of providers and healthcare technology, that may impact outcomes for rural patients.⁴⁻⁶ These and other variables that are heavily affected by rurality and geographic location may have substantial impact on healthcare-seeking behavior, compliance, and outcomes for rural populations and may result in differential scores on quality measures

by rurality. Further, because the sociodemographic characteristics of populations differ by rurality, it is especially important to consider how the relationship between patient characteristics and quality outcomes varies by location, and, in turn, what impact that variation would have on adjustment of quality outcomes.

The purpose of this policy brief is to identify how rurality and key sociodemographic variables impact patient outcomes for rural populations using specific quality measures appropriate for rural contexts (e.g., readmission rates^{3,7-8}), and to estimate the potential impact of adjusting for rural context on quality measurement.

Approach

Data from the 2012 Medicare Current Beneficiary Survey (MCBS) Access to Care (ATC) module were used to model six quality outcomes: satisfaction with care, blood pressure checked in past year, cholesterol checked in past year, flu shot in past year, change in health status, and all-cause readmission in past year. The ATC is an annual survey of Medicare beneficiaries, asking them about their perceptions of Medicare benefits and their experiences with health services. It also includes multiple sociodemographic and health characteristics. We restricted our sample to beneficiaries who were aged 65 and older and who did not live in an institutional setting (n=10,595.)

We first conducted bivariate analyses to determine differences in quality outcomes by rurality. Rurality was defined as metropolitan, micropolitan (larger rural), or non-core (smaller rural) based on Office of

Management and Budget definitions and using beneficiaries' county of residence. Next, to determine the likelihood of having used health services (therefore being "at risk" of each quality outcome), we conducted logistic regression models assessing the odds of a beneficiary having had a physician visit in the past year based on rurality, sociodemographics, and health characteristics.

Conditional on having had a physician visit in the past year (n=6,296), we used logistic regression models to assess the impact of sociodemographic and health characteristics on each quality outcome in order to determine whether it impacted the relationship between rurality and the outcome. Sociodemographic characteristics included travel time to usual doctor's office (30 minutes or more vs. less than 30 minutes; fewer than 20% of all respondents across locations traveled 30 minutes or more), educational attainment, age, gender, race/ethnicity, living arrangement (alone vs. with others), and Medicaid eligibility. We also adjusted for the following health characteristics: self-rated health, presence of functional limitations (limitations in activities of daily living or instrumental activities of daily living), and count of chronic conditions.

Following the logistic regression models predicting quality outcomes, we generated predicted adjusted quality outcomes using marginal effects by rurality in order to determine whether quality outcomes were impacted by adjustment for sociodemographic characteristics. We subtracted the value of the fully-adjusted outcomes (accounting

for sociodemographic and health characteristics) from unadjusted outcomes (using the absolute value for the difference in readmissions) in order to determine the magnitude of change. For all analyses, we used survey weights to approximate national estimates.

Results

Differences in unadjusted quality outcomes by rurality

Micropolitan and non-core beneficiaries were significantly less likely to be satisfied with the care they had received compared with metropolitan beneficiaries (92.8% and 94.2% vs. 95.0%, $p<0.01$, respectively; Table 1, next page), and they were also more likely to have had a hospital readmission in the past year, compared with metropolitan beneficiaries (5.0% and 6.3% vs. 4.0%, respectively). There were no significant differences in any of the other four quality outcomes: blood pressure checked in the past year, cholesterol checked in the past year, flu shot in the past year, and change in health status in the past year.

Likelihood of physician visit in past year

In order to determine who was "at risk" of each quality outcome, we next modeled the likelihood of having seen a physician in the past year (full results not shown here.) Micropolitan and non-core residents had significantly higher odds of having seen a physician in the past year, compared to metropolitan residents. (For those beneficiaries who had seen a physician, the mean number of visits did not vary by geographic location.) Having more education, any functional limitations, more

chronic conditions, being older, and being eligible for Medicaid were all also associated with higher odds of having seen a physician. In contrast, being in excellent/very good health, being male, and being Hispanic or Asian were all associated with lower odds of having seen a physician in the past year.

Adjusted quality outcomes by rurality

In logistic regression models conditional on having seen a physician in the past year (full results not shown here), living in a micropolitan area was associated with lower odds of being satisfied with one's care and lower odds that one's health did not get worse in the past year, compared with living in a metropolitan area. Having more education was associated with better quality in the areas of satisfaction with care, getting a flu shot, and change in health status. Being eligible for Medicaid was associated with lower odds of having received a flu shot in the past year. Results were mixed across quality outcomes for health status, age, and race/ethnicity.

In every case, quality outcomes by rurality were better after running fully-adjusted logistic regression models, consistent with other research has shown about the impact of risk-adjustment (Table 2). This suggests that the outcomes of care are dependent on individual patient characteristics, many of which lie outside of the control of health care providers. In most cases, adjusted quality outcomes were better in metropolitan areas than in micropolitan and non-core areas, although few of these differences

Table 1. Differences in Unadjusted Quality Outcomes by Rurality

	Metropolitan	Micropolitan	Non-core
Satisfied with care	95.0%	92.8% ^a	94.2%
Blood pressure checked, past year	96.4%	95.8%	96.8%
Cholesterol checked in past year	89.8%	87.8%	88.3%
Flu shot in past year	73.3%	72.3%	70.1%
Health same or better than past year	79.8%	78.8%	80.0%
All-cause readmission in past year	4.0%	5.0%	6.3% ^b
N=10,595			

a. Micropolitan significantly different from metropolitan at p<0.05
b. Non-core significantly different from micropolitan at p<0.001.

Table 2. Adjusted Quality Outcomes by Rurality^a

	Metropolitan	Micropolitan	Non-core
Satisfied with care	98.0%	97.7%	98.6% ^b
Blood pressure checked, past year	99.2%	98.6%	99.0%
Cholesterol checked in past year	93.8%	92.1%	91.1%
Flu shot in past year	76.0%	74.0%	73.3%
Health same or better than past year	83.8%	80.7% ^c	82.6%
All-cause readmission in past year	3.6%	3.4%	4.4%
N=6,296			

a. Analysis includes sample who had seen a physician in the past year. Results are presented as predicted quality outcomes, generated using marginal effects after logistic regression models.
b. Non-core significantly different from micropolitan at p<0.05.
c. Micropolitan significantly different from metropolitan at p<0.05.

Table 3. Differences between Unadjusted and Adjusted Quality Outcomes by Rurality^a

	Metropolitan	Micropolitan	Non-core	Full Sample
Satisfied with care	3.02%	4.88%	4.40%	4.10%
Blood pressure checked, past year	2.84%	2.83%	2.21%	2.63%
Cholesterol checked in past year	3.97%	4.35%	2.82%	3.71%
Flu shot in past year	2.69%	1.69%	3.15%	2.51%
Health same or better than past year	4.01%	1.89%	2.59%	2.83%
All-cause readmission in past year	-0.43%	-1.57%	-1.88%	-1.29%
Average Difference	2.83%	2.87%	2.84%	2.85%

a. Differences are calculated by subtracting the adjusted values from the unadjusted values for each measure. To calculate the average difference, we used the absolute value of the difference for readmissions.

were statistically significant.

Across all geographic locations, the average difference between unadjusted and adjusted quality outcomes was an improvement of 2.9%, with no statistically significant difference in the magnitude of adjustment by rurality (Table 3, previous page). Satisfaction with care had the biggest difference, with a four percentage-point increase in quality after adjustment.

Conclusions & Policy Implications

We found that across all geographic locations, quality outcomes were impacted by sociodemographic characteristics. After adjusting for individual characteristics, all six quality outcomes that we assessed improved. This is consistent with other research showing that quality measures are partially dependent on patient characteristics, many of which are beyond the control of health care providers.¹ This finding indicates that without risk-adjustment, providers serving sociodemographically-disadvantaged populations, including those in rural areas, will appear worse

on quality measures. This has important implications for how providers are evaluated – and increasingly, how they are paid.

We also found that the association between sociodemographic characteristics and quality outcomes differed by the outcome measured. This indicates that improving quality may require a multifaceted approach and that risk-adjustment will not have uniform effects on all quality measures. While we did not directly measure the impact of community-level characteristics beyond location, these findings point to the importance of taking the rural environmental context into account when making decisions about risk-adjustment for quality measures. Future research should explore the impact of community-level characteristics in more detail.

While not technically a quality outcome, access to care is an important determinant of quality. It is notable, therefore, that there were differences by geographic, sociodemographic, and health characteristics in the likelihood of having seen a physician in the past year. This could have

multiple important implications for quality outcomes. First, if health care providers and professionals are only judged on the basis of the patients they do see, it is important to control for which beneficiaries are most likely to get in the door in the first place. Second, to the extent that regular visits are important for health maintenance and subsequent health outcomes, providers whose patients do not regularly visit may be penalized for resultant poorer quality outcomes.

From a policy perspective, these findings provide evidence that it is necessary and important to take geographic context into account in any decisions about risk-adjustment for quality rankings, research on community and hospital health outcomes, and value-based purchasing arrangements. Current discussions about risk-adjustment for quality outcomes often neglect to include rurality and geographic location, which will lead to incomplete and inappropriate conclusions about the relationships between sociodemographic characteristics and quality of care. ■

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