

# Efforts to Reduce Racial Disparities in Medicare Managed Care Must Consider the Disproportionate Effects of Geography

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**R**acial disparities are a broad issue for the US healthcare system. The importance of racial disparity as a policy issue is apparent from *Healthy People 2010*, which has the elimination of racial disparities in health and healthcare by 2010 as an overarching goal.<sup>1</sup> Similarly, a goal of the US Department of Health and Human Services' Initiative on Racial and Ethnic Disparities is elimination of racial disparities in health and healthcare.<sup>2</sup> The Centers for Medicare & Medicaid Services (CMS) is challenged to identify ways to eliminate or at least reduce these disparities in the Medicare program for both managed care<sup>3-7</sup> and fee-for-service<sup>8-16</sup> populations, where the existence of racial disparities in health, receipt of healthcare, and health outcomes is well documented and recognized. Despite the consistency of the evidence for the existence of racial disparities in the Medicare program, the best strategy for eliminating this variation has not been established.

Although often treated as a completely separate issue, geographic variation in patterns of healthcare is also well recognized and documented.<sup>17-22</sup> Like racial disparity, the causes of geographic variation are poorly understood and are attributed to factors such as physician supply, local practice patterns, and patient culture.

A challenge to studying both race and geography in healthcare is the strong geographic concentration of our racial/ethnic populations.<sup>23</sup> For example, the black population is geographically concentrated in the South Central and southeastern United States (Figure). As others have noted,<sup>5,16,24,25</sup> the disproportionate use of lower quality providers (be they physicians, hospitals, or managed care plans) by black elders compared with white elders complicates studies of racial disparity. As a result, researchers have 2 related challenges: first, an analytic issue and second, a policy issue. As an analytic issue, techniques such as multiple regression are frequently used to "remove" or "adjust for" the effects of potentially confounding factors such as geography. Typical multivariable approaches to studying race after adjusting for geography may underestimate the magnitude of the disparity by controlling for elements (ie, geography)

that are causally related to the disparity. Second, clustering of racial or ethnic groups into poor-quality hospitals or health plans might point to interventions aimed at helping elders make better choices—such as choosing a

**Objective:** To examine the impact of geographic variation on racial differences in 7 of 15 Health Plan Employer Data and Information Set (HEDIS) measures that assess the quality of the Medicare managed care program (also known as Medicare+Choice).

**Study Design:** Cross-sectional analysis using the 2004 individual-level HEDIS for Medicare managed care plans and 2003 Medicare enrollment and demographic (ie, denominator) data for more than 5.1 million Medicare+Choice enrollees.

**Methods:** Individual-level HEDIS data were linked with Medicare enrollment data. Hierarchical generalized linear models were used to assess statistical significance of region and race. Direct standardization was used to estimate the rate of meeting each HEDIS standard while controlling for differences in age and sex.

**Results:** Quality of care for white Medicare+Choice enrollees was strongly correlated with the racial composition of the geographic area. Except for cholesterol management after an acute cardiac event, between-region racial variation was consistently greater than within-region racial variation.

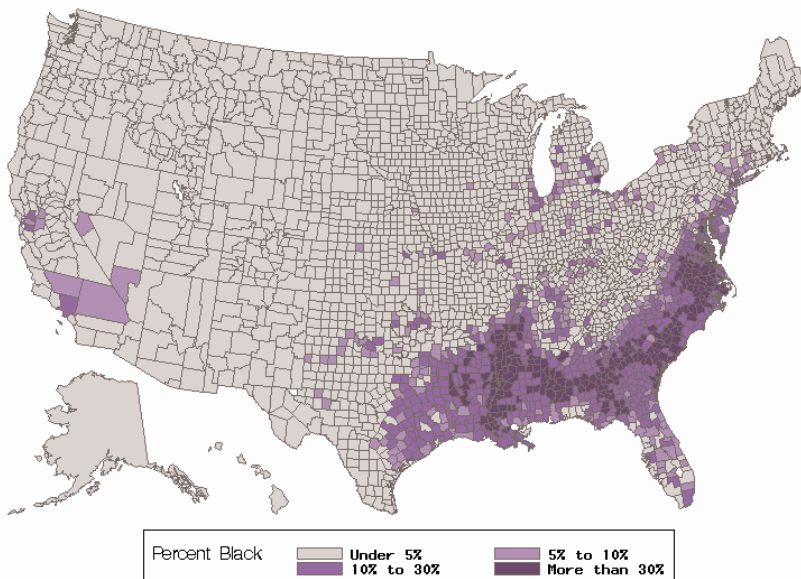
**Conclusion:** Removing within-region racial variation while ignoring geographic differences will not equalize the experiences of black and white elders. Rather, both racial and geographic components of healthcare quality must be addressed if the Medicare managed care program is to provide care of equal quality to all elders regardless of race.

(*Am J Manag Care.* 2007;13:51-56)

**In this issue**  
Take-away Points / p56  
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**For author information and disclosures,  
see end of text.**

■ **Figure.** Geographic Distribution of the Black Population by County in the United States, 1999



CY indicates calendar year.

higher quality hospital. However, if the inequality has a strong regional component, the policy options will be quite different and may need to focus on changing regional care disparities.

With these challenges in mind, the objective of this study was to examine the impact of geographic variation on racial differences in 7 Health Plan Employer Data and Information Set (HEDIS) measures that assess the quality of the Medicare managed care program (also known as Medicare+Choice [M+C]).

## METHODS

### Data

Data sources for this study are (1) the individual-level HEDIS data submitted by Medicare managed care plans for reporting year 2004 (based on 2003 experience) as a condition for continuing their M+C contract; (2) CMS denominator (ie, enrollment) files for 2003; and (3) US Census data.

HEDIS data were merged with CMS denominator files using the approach previously described.<sup>2</sup> Briefly, individual HEDIS records, each containing the Health Insurance Claim (HIC) number, a unique identifier assigned by Medicare, were merged with the Medicare denominator file to obtain information on age, race, sex, and ZIP code of residence. Individuals were excluded from this analysis if they did not

have a valid HIC, if their race was not classified as black or white, or if they were younger than age 65 years in 2003. Plans were excluded from this analysis if their submitted records failed to achieve at least a 90% match rate on the HIC.

Overall, 148 of 162 M+C plans submitted individual-level data that were linkable with Medicare demographic information (91.4% of plans). These plans represent the experience of 81.4% of the more than 5.1 million 2003 M+C enrollees. Of 8 regions, 6 had plans that were excluded because of lack of identifiers. Finally, plans were excluded from specific measures if the audited summary reporting for the measure was not similar to the plan summary calculated from the individual records. No region had more than 3 plans excluded.

**Table 1** shows the characteristics of Medicare managed care plans that submitted individual-level HEDIS data and

the number of persons included in the sample for each HEDIS quality indicator. The number of plans and subjects included in these analyses varied from measure to measure because of differing reporting requirements.

### Study Measures

The analysis focused on 7 of the 15 HEDIS 2004 measures related to quality and outcomes. We confirmed that the patterns we reported held for the remaining 8 measures (analysis available on request).

Race was obtained directly from the 2003 Medicare denominator files. The categories included in this analysis were white and black. All but 1 plan had at least some black members, with a median of 5.5% black and a maximum of 68% black. We imputed household income indirectly, based on figures from the US Census on the median disposable household income by ZIP code for households with persons age 65 years and older. This income estimate was grouped into 4 categories: (1) <\$15 000; (2) \$15 000 to <\$30 000; (3) \$30 000 to ≥\$45 000; and (4) >\$45 000.

Area of residence was grouped into the 8-level Census division designation: New England, East North Central, Middle Atlantic, South Central, South Atlantic, West North Central, Pacific, and Mountain.

Health plan size was classified as fewer than 10 000 members, 10 000 to 49 999 members, and 50 000 or more members.

## Geography and Racial Disparities

**Table 1.** Description of Quality Measures

Category	Quality Indicator	Eligibility	No. of Plans	No. of Whites	No. of Blacks
Breast cancer screening	Received a mammogram in past 2 y	Women age 65-69 y	146	181 180	18 615
Comprehensive diabetes care	A1C screening and eye exam	Persons age 65-75 y diagnosed with diabetes	148	83 166 (screening) and 82 397 (exam)	12 889 (screening) and 12 855 (exam)
β Blocker after heart attack	Received prescription for β blocker within 7 days of discharge	Persons age 65 y or older discharged alive after AMI	141	13 763	1302
Cholesterol management	Screening	Persons age 65-75 y discharged alive after AMI, CABG, or PTCA	145	24 384	2055
Controlling high blood pressure	Maintained blood pressure of 140/90 mm Hg	Persons age 46-85 y diagnosed with hypertension	141	46 284	7236
Follow-up after hospitalization for mental illness	Received follow-up with mental health practitioner 30 days after hospital discharge	Persons age 65 y or older hospitalized for mental illness	139	7421	883

A1C indicates glycosylated hemoglobin; AMI, acute myocardial infarction; CABG, coronary artery bypass graft; PTCA, percutaneous transluminal coronary angioplasty.

### Statistical Analysis

All analyses were conducted using SAS version 9.13 (SAS Institute Inc, Cary, NC). We used a hierarchical generalized linear model to account for the nesting of enrollees within health plans. For each measure, we estimated the within-region quality of care separately for white and black enrollees. We used multiple regression models to assess the impact of factors on quality of care: demographic variables (age, sex, and area income), plan size, percentage of the region that was black, race, geography, and a race/geography interaction. Adjusted rates were calculated for each measure.

The study was approved by the Chesapeake Research Review, Inc, institutional review board (institutional review board for the National Committee on Quality Assurance), protocol number CRR1 0204002.

## RESULTS

The racial composition of the Medicare managed care population varied considerably across census divisions, ranging

from 2% black in New England to 13.8% black in the South Central division (**Table 2**). Likewise, there was considerable variation across geography in mean level of HEDIS measures for white populations. We used quality for whites as an overall measure of local background quality, which allowed us to separate quality differences that can be attributed to race alone, geography alone, and a combination of race and geography. For example, the spread in performance across geography ranged from 6.4% for glycosylated hemoglobin (A1C) testing to more than 20% for diabetic eye exams and follow-up after mental health hospitalizations. For all measures, divisions with higher percentages of blacks had significantly lower HEDIS quality scores (all  $P < .05$ ).

**Table 3** illustrates the cumulative effects of race and geography on the experience of black M+C enrollees compared with white enrollees. With few exceptions, the geographic disadvantage is greater than the within-area racial disparity. For example, the geographic disparity for controlling high blood pressure was 11.9%, whereas racial disparities within a geographic area ranged from 3.1% to 10.7%. The only consistent

■ **Table 2.** Variation in HEDIS Measures Across Census Divisions for Whites\*

Measure	Percentage								Difference Between Highest and Lowest Region, % <sup>†</sup>
	NE	MTN	PAC	WNC	SA	ENC	MA	SC	
% Black	2.0	2.8	4.9	6.0	11.3	12.6	12.6	13.8	11.8
β-Blocker use	97.9	93.0	96.1	92.7	91.8	90.7	94.6	87.9	10.0
A1C testing	91.6	88.2	91.4	90.95	87.1	87.0	86.0	85.3	6.4
Eye examination	75.6	57.6	78.6	71.3	60.4	61.6	61.7	52.5	26.1
30-day mental illness follow-up	72.2	57.3	57.1	63.9	53.4	59.8	63.8	46.3	25.9
Cholesterol management	85.3	81.6	84.1	78.1	84.3	81.1	84.8	76.2	8.6
Breast cancer screening	84.3	74.6	78.4	75.8	77.3	73.5	72.9	69.9	14.4
Controlling blood pressure	65.4	53.7	58.5	62.3	65.6	61.7	64.8	61.0	11.9

\*Adjusted for age, sex, and income.

<sup>†</sup>Difference between the highest-performing and the lowest-performing division.

HEDIS indicates Health Plan Employer Data and Information Set; NE, New England; MTN, Mountain; PAC, Pacific; WNC, West North Central; SA, South Atlantic; ENC, East North Central; MA, Middle Atlantic; SC, South Central; A1C, glycosylated hemoglobin.

exception to the pattern of across-geography variation in quality for whites exceeding the within-region racial variation is cholesterol management; for 4 of 8 regions, the white/black variation was higher within the region than between regions. Other specific exceptions to this pattern are β-blocker use in the Mid-Atlantic region and A1C testing in the West North Central region. We found significant geography/race interactions for all measures except controlling high blood pressure. This pattern is consistent with the information in Table 3, which shows considerable variation in the magnitude of the white/black difference in measures by region.

The relative impact of eliminating the impact of geographic and racial disparity can be illustrated by considering the effect of eliminating within-census division racial disparity but not equalizing performance across census divisions. As can be seen in Table 4, in such a case, the national level of β-blocker use after heart attack would move from 85.1% to 87.1% for blacks and remain unchanged at 93.4% for whites. However, if racial variation within areas were allowed to remain but regional variation were removed and all regions were to achieve the levels experienced by the highest performing area (in this case, New England), performance would improve to 96.3% for blacks and 97.9% for whites. The remaining racial variation would be similar to that seen with a fully regression-adjusted, race-based approach (about 1.4%). Notice that removing area variation would result in improvements in performance for both blacks and whites, but

would particularly benefit blacks (an absolute increase of 12.8% vs 4.5%).

## DISCUSSION AND CONCLUSION

Our results are consistent with prior literature showing considerable racial and geographic variability in quality of care in the Medicare managed care sector. We observed small but significant levels of racial disparity within all regions of the country. The estimates we present are somewhat conservative because we did adjust for differences in area income. Because of the correlations among race, geography, and poverty, some of the effect of area variation was removed by our regression models. Despite these adjustors, both racial and geographic disparities remained.

The presence of a strong correlation between the racial composition of an area and the level of quality should not be seen as evidence of a causal relationship—variation in quality is complex and due to multiple factors. With all trends, exceptions also exist. The Mountain states have a very small percentage of black beneficiaries, but are among the lowest in quality as measured by HEDIS. Likewise, for breast cancer screening, the measure with both the highest overall performance and the greatest consistency across divisions, blacks sometimes have minimally higher-quality scores than whites. Despite the fact that the correlation should not be interpreted as indicating a causal relationship between racial composition and quality, it may point to a strategy to reduce

## Geography and Racial Disparities

**Table 3.** Quality Differences Between White and Black Enrollees by Census Division and HEDIS Measure\*

Measure	Percentage							
	NE	MTN	PAC	WNC	SA	ENC	MA	SC
% Black	2.0	2.8	4.9	6.0	11.3	12.6	12.6	13.8
β-Blocker use	1.6	4.1	0.7	1.5	7.3	6.6	13.3	5.4
A1C testing	-2.0	1.4	2.2	10.7	0.5	1.0	5.4	1.0
Eye examination	5.5	0.1	1.1	9.3	-2.5	-0.5	5.8	-3.4
30-day mental illness follow-up	-0.6	0.2	6.3	10.6	9.9	25.8	18.2	7.9
Cholesterol management	4.0	7.5	0.2	16.2	7.2	14.3	11.6	9.4
Breast cancer screening	-2.8	4.1	-0.4	3.2	-0.2	-2.5	3.5	-0.7
Controlling blood pressure	8.0	8.9	3.1	6.7	5.6	3.8	10.7	7.1

\*Calculated as white rate minus black rate; a negative number indicates higher quality for black Medicare+Choice enrollees. HEDIS indicates Health Plan Employer Data and Information Set; NE, New England; MTN, Mountain; PAC, Pacific; WNC, West North Central; SA, South Atlantic; ENC, East North Central; MA, Middle Atlantic; SC, South Central; A1C, glycosylated hemoglobin.

race-based inequality that will ultimately improve the experience of both black and white beneficiaries.

We were unable to assess whether the racial disparities were different in plans that did not submit data or submitted data without identifiers that could be linked with CMS enrollment and demographic data. Likewise, because the HEDIS data do not contain information about the treating physician, we cannot comment on the role individual physicians play in racial disparity. However, the effects that we describes are broad and consistent, suggesting that they are the result of more than the behavior of a single physician. Likewise, all regions have 9 or more plans, so the experience of a single plan would not explain a regional effect.

CMS has an ongoing commitment to eliminating racial disparity that is both commendable and just. It would be

rational for such a policy to focus on within-area interventions. However, this approach would not necessarily remove or lessen overall racial disparity because it fails to address the component of racial disparity that is tied to geographic disparity. A purely within-area approach is unlikely to equalize the average experience of black and white beneficiaries. The importance of considering both racial and regional variation is illustrated in Table 4, which highlights the disproportionate impact of geographic disparity on black populations and the need to recognize geographic variation as an important contributor to existing racial disparity.

The obstacles associated with efforts targeted to a particular racial group are numerous and include problems with identifying eligible individuals. As a result, a geography-centered approach to quality improvement may be a strong step toward

**Table 4.** Impact of Equalizing Race, Geography, or Both on Racial Variation in β-Blocker Use

Measure	No Change, No Geographic Adjustment		Equalize Within-region Racial Variation		All Regions Achieve the Level of the Best-performing Region; Retain That Region's Racial Variation		All Regions Achieve the Level of the Best-performing Region; Remove That Region's Racial Variation	
	White	Black	White	Black	White	Black	White	Black
β-Blocker use	93.4%	85.1%	93.4%	87.1%	97.9%	96.3%	97.9%	97.9%

CY indicates calendar year.

### ■ Take-away Points

Analysis of quality of care measures for more than 5.1 million Medicare+Choice enrollees in 2003 revealed consistent patterns of racial and geographic disparity. The geographic disparity was greatest in areas with the highest concentration of black elders suggesting that:

- Efforts to reduce racial disparity cannot ignore geographic inequality.
- A strategy that focuses on equalizing geographic disparity may disproportionately benefit black elders and would be a strong step toward the reduction of racial disparity.

achieving the goal of lessening racial disparity in Medicare managed care. We believe that this approach is particularly well suited for improving performance in areas that have poor-quality for both black and white populations.

### Acknowledgments

Portions of this work were presented at AcademyHealth's 2005 Annual Research Meeting, Boston, Mass, June 26-28, 2005. The authors would like to thank Drs Trent Haywood, MD, Ignatious Bau, JD, and Alan Zaslavsky, PhD, for their helpful comments and suggestions, and Russell Mardon, PhD, and Rich Mierzejewski, MS, for their assistance with analysis.

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**Funding Source:** This work was supported by a grant from The California Endowment (Targeted Capacity Expansion [TCE] grant 20032907).

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