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## Quality of Care for White and Hispanic Medicare Advantage Enrollees in the United States and Puerto Rico

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### Abstract

**IMPORTANCE**—Geographic, racial, and ethnic variations in quality of care and outcomes have been well documented among the Medicare population. Few data exist on beneficiaries living in Puerto Rico, three-quarters of whom enroll in Medicare Advantage (MA).

**OBJECTIVE**—To determine the quality of care provided to white and Hispanic MA enrollees in the United States and Puerto Rico.

**DESIGN, SETTING, AND PARTICIPANTS**—A cross-sectional study of MA enrollees in 2011 was conducted, including white enrollees in the United States ( $n = 6\,289\,374$ ), Hispanic enrollees in the United States ( $n = 795\,039$ ), and Hispanic enrollees in Puerto Rico ( $n = 267\,016$ ). The study was conducted from January 1, 2011, to December 31, 2011; data analysis took place from January 19, 2015, to January 2, 2016.

**MAIN OUTCOMES AND MEASURES**—Seventeen performance measures related to diabetes mellitus (including hemoglobin A<sub>1c</sub> control, retinal eye examination, low-density lipoprotein cholesterol control, nephropathy screening, and blood pressure control), cardiovascular disease (including low-density lipoprotein cholesterol control, blood pressure control, and use of a  $\beta$ -blocker after myocardial infarction), cancer screening (colorectal and breast), and appropriate

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**Author Contributions:** Drs Rivera-Hernandez and Trivedi had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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*Study supervision:* Trivedi.

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medications (including systemic corticosteroids and bronchodilators for chronic obstructive pulmonary disease [COPD] and disease-modifying antirheumatic drugs).

**RESULTS**—Of the 7.35 million MA enrollees in the United States and Puerto Rico in our study, 1.06 million (14.4%) were Hispanic. Approximately 25.1% of all Hispanic MA enrollees resided in Puerto Rico, which was more than those residing in any state. For 15 of the 17 measures assessed, Hispanic MA enrollees in Puerto Rico received worse care compared with Hispanics in the United States, with absolute differences in performance rates ranging from 2.2 percentage points for blood pressure control in diabetes mellitus ( $P = .03$ ) to 31.3 percentage points for use of disease-modifying antirheumatic drug therapy ( $P < .01$ ). Adjusted performance differences between Hispanic MA enrollees in Puerto Rico and Hispanic MA enrollees in the United States exceeded 20 percentage points for 3 measures: use of disease-modifying antirheumatic drug therapy (−23.8 percentage points [95% CI, −30.9 to −16.8]), use of systemic corticosteroid in COPD exacerbation (−21.3 percentage points [95% CI, −27.5 to −15.1]), and use of bronchodilator therapy in COPD exacerbation (−22.7 percentage points [95% CI, −27.7 to −17.6]).

**CONCLUSIONS AND RELEVANCE**—We found modest differences in care between white and Hispanic MA enrollees in the United States but substantially worse care for enrollees in Puerto Rico compared with their US counterparts. Major efforts are needed to improve care delivery on the island to a level equivalent to the United States.

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Fifty years ago, the Medicare program extended health insurance to older adults and persons with disabilities across the 50 states; Washington, DC; and the US territories. Although all Medicare enrollees receive a standard set of insurance benefits, stark geographic and racial variations in care and outcomes have been well documented<sup>1,2</sup> and are the focus of attention from policymakers. Of note, few studies include Medicare beneficiaries living in the US territories.

The Medicare program and, in particular, Medicare Advantage (MA) plays a critical role in financing and delivering health care in Puerto Rico, the largest of the US territories. Of the 750 000 Medicare beneficiaries in Puerto Rico, 74.1% are enrolled in an MA plan<sup>3</sup>; this is the highest MA participation rate of any state or territory. Medicare Advantage plans in Puerto Rico, like their US counterparts, often subsidize Medicare's Part B premium and have lower cost-sharing than that of traditional Medicare. Therefore, MA plans are particularly attractive to low-income Puerto Rican Medicare beneficiaries. In 2015, a total of 11 MA plans operated in Puerto Rico.<sup>4</sup> They receive \$5 billion in capitated payments annually, accounting for approximately half of the territory's health care expenditures.<sup>5,6</sup>

Assessing health care for Puerto Rican Medicare beneficiaries is important for 3 reasons. First, economic and health conditions on the island lag behind those of the United States. The median income in Puerto Rico is 37% that of the United States (\$19 429 vs \$51 321), and the rate of unemployment is 2.4 higher (12% vs 5%).<sup>7,8</sup> Puerto Rico's recent credit default in August 2015<sup>9</sup> and outstanding debt of \$72 billion raises the prospect of continued economic deterioration. Compared with US residents, Puerto Rico's population experiences higher overall and infant mortality rates and lower life expectancy<sup>10</sup> as well as a greater prevalence of diabetes mellitus and heart disease.<sup>11</sup>

Second, Puerto Rican MA plans receive lower payments than US MA plans owing to underlying differences in health care costs and payment regulations that are specific to Puerto Rico's fee-for-service and MA programs. Recent payment rates to MA plans in Puerto Rico were 40% lower than per-capita payments to MA plans in the United States.<sup>5</sup> Several factors reduce traditional Medicare expenditures in the territory and, by extension, payment rates to MA plans; these factors include adjustments for lower inpatient costs in Puerto Rico and a substantially higher fraction of Puerto Rican beneficiaries who lack Part B coverage for outpatient services.<sup>12,13</sup> For decades, Puerto Rican MA plans have also been subject to different minimum payment rates than US-based MA plans.<sup>14</sup> In 2016, the Centers for Medicare & Medicaid Services is expected to further reduce payments to Puerto Rican MA plans by 11% while increasing payments to US-based MA plans by 3%.<sup>15,16</sup> These cuts include both Affordable Care Act–mandated payment reductions and additional payment adjustments.<sup>17</sup>

Third, funding for Medicaid and low-income assistance programs in Puerto Rico is more constrained than in any state.<sup>18–20</sup> These programs provide coverage of Medicare's co-payments and deductibles for beneficiaries with incomes near or below the federal poverty level. Medicaid in Puerto Rico operates as a block grant with an annual cap and restricted eligibility. Federal funding for assistance programs to help low-income beneficiaries pay for prescription drug costs is lower than in the United States.<sup>21</sup> The combination of strained economic circumstances and reduced health care funding may have deleterious effects on the quality of care in Puerto Rico and undermine the federal goal of promoting equity in health care delivery in the Medicare program.

The purpose of this study was to compare the quality of care among the following 3 groups of MA enrollees: whites in the United States, Hispanics in the United States, and Hispanics in Puerto Rico. We focused on these 3 groups since 99% of Puerto Ricans self-identify as Hispanic.<sup>22</sup>

## Methods

### Data Sources

We acquired the 2011 Healthcare Effectiveness Data and Information Set (HEDIS) for MA plans from the Centers for Medicare & Medicaid Services; data are not deidentified. The data contained 9 423 330 person-level observations from 471 MA plans among beneficiaries eligible for at least 1 of 17 quality measures related to diabetes mellitus, cardiovascular disease, appropriate medication use, or cancer screening (eTable 1 in the Supplement provides a description of each measure). Each observation included an individual's health plan and indicator variables denoting eligibility for and adherence to HEDIS quality measures. The National Committee for Quality Assurance website provides detailed information about data collection methods and HEDIS compliance audits.<sup>23</sup> Puerto Rican MA plans follow the same data collection procedures as those located in the 50 states and Washington, DC.<sup>24</sup> We matched 99.0% (9 329 772) of MA beneficiaries in the HEDIS data with the Medicare Master Beneficiary Summary File to obtain enrollees' demographic information. Data on zip code–level rates of poverty were derived from the American Community Survey (ACS).<sup>25</sup> The study protocol was approved by the Brown University's

Human Research Protections Office and the Centers for Medicare & Medicaid Services Privacy Board. The study was conducted from January 1, 2011, to December 31, 2011; data analysis took place from January 19, 2015, to January 2, 2016.

### Study Population

We excluded 170 576 enrollees who could not be matched to ACS data, 621 094 persons younger than 65 years, 1 185 484 who were not Hispanic or non-Hispanic white, and 214 whose residence was not in the United States or Puerto Rico. We further excluded 447 Puerto Rican residents who were enrolled in an MA plan outside Puerto Rico and 528 Puerto Rican residents who were not Hispanic. A sensitivity analysis that included both of these groups in the Puerto Rican sample demonstrated similar results to those presented below. Our main analytic cohort consisted of 6 289 374 white MA enrollees residing in the 50 US states and Washington, DC; 795 039 Hispanic enrollees residing in the 50 US states and Washington, DC; and 267 016 Hispanic enrollees residing in Puerto Rico (eFigure in the Supplement). We hereafter use *United States* to refer to the 50 states and Washington, DC.

### Measures

Our outcome variables were 17 dichotomous HEDIS quality measures related to diabetes mellitus, cardiovascular disease, cancer screening, and appropriate medication (eTable 1 in the Supplement provides a full description of each variable). Quality measures related to diabetes care included hemoglobin (Hb) A<sub>1c</sub> testing, HbA<sub>1c</sub> control at greater than 9% (to convert to a proportion of total Hb, multiply by 0.01), retinal eye examination, low-density lipoprotein cholesterol (LDL-C) screening, LDL-C control at less than 100 mg/dL (to convert to millimoles per liter, multiply by 0.0259), nephropathy screening, and blood pressure control at less than 140/90 mm Hg.

Four measures related to cardiovascular disease included LDL-C screening among persons with ischemic heart disease, LDL-C level less than 100 mg/dL among persons with ischemic heart disease, persistence of  $\beta$ -blocker treatment for 6 months following a myocardial infarction, and blood pressure control at less than 140/90 mm Hg among persons with hypertension.

Four measures related to appropriate drug use included inappropriate use of at least 1 high-risk medication in the elderly, use of disease-modifying antirheumatic drug therapy for rheumatoid arthritis, use of a systemic corticosteroid for chronic obstructive pulmonary disease (COPD) exacerbation, and use of a bronchodilator for COPD exacerbation. Finally, we assessed breast cancer screening and colorectal cancer screening. All but 2 of the above measures pertained to outpatient care, with the exceptions being 2 measures related to COPD.

Our primary independent variables were Hispanic ethnicity and residence in Puerto Rico. Hispanic ethnicity was defined using an algorithm developed by the Research Triangle Institute for the Medicare Master Beneficiary Summary File. Compared with the traditional enrollment database race code, the Research Triangle Institute variable has higher sensitivity (79% vs 29%) for identifying Hispanic beneficiaries and the same specificity (99% vs 99%).<sup>26</sup> We defined *Puerto Rican residence* as residing in Puerto Rico with enrollment in 1

of the 13 MA plans operating in Puerto Rico in 2011. Covariates included age (in years), sex, and zip code–level information on the percentage of individuals with income below the federal poverty level.

### Statistical Analysis

We compared sociodemographic characteristics for white MA enrollees in the United States, Hispanic MA enrollees in the United States, and Hispanic MA enrollees in Puerto Rico using  $\chi^2$  and unpaired 2-tailed *t* tests. For each HEDIS indicator, we determined the performance as the percentage of eligible MA enrollees who met criteria for the measure. In addition, we determined the adjusted performance difference between the following MA enrollees: (1) whites in the United States, (2) Hispanics in the United States, and (3) Hispanics in Puerto Rico. We fit generalized linear models with an identity link function and binary distribution specification to present adjusted estimates on the risk difference scale. We accounted for the clustering of individuals within health plans using generalized estimating equations. Because the composition of the US Hispanic population differs by state,<sup>27</sup> we compared performance among Hispanics in Puerto Rico with performance among Hispanics in the 5 states with the largest populations of Hispanic MA beneficiaries: California, Arizona, Florida, New York, and Texas. These analyses are presented in eTable 2 in the Supplement. Finally, all 13 MA plans in Puerto Rico were for-profit; thus, we included a stratified analysis of for-profit plans (eTable 3 in the Supplement). All analyses were conducted in SAS, version 9.4 (SAS Institute Inc).

## Results

### Characteristics of the Study Sample

In our study cohort of 7.35 million MA enrollees, the number of Hispanics enrolled in MA plans in the United States and Puerto Rico in 2011 was 1 062 055 (14.4% of the total). Approximately 25.1% of all Hispanic MA enrollees resided in Puerto Rico, which was more than those residing in any state. Sociodemographic characteristics of the study participants by Hispanic ethnicity and Puerto Rico residence are listed in Table 1. Overall, MA members in the United States and Puerto Rico were similar in age, were predominantly female, and had high rates of Medicare Part D coverage. The median zip code–level rate of poverty was 10.7% among white MA enrollees, 16.3% among Hispanic MA enrollees in the United States, and 47.9% among Hispanic MA enrollees in Puerto Rico ( $P < .001$ ).

### Unadjusted Performance Rates

Table 2 presents the unadjusted performance rates of HEDIS quality measures by ethnicity and residency in Puerto Rico. Compared with white enrollees in the United States, Hispanic enrollees in the United States had significantly better performance for 7 measures, significantly worse performance for 9 measures, and statistically similar performance for 1 measure. However, the magnitude of the difference exceeded 5 percentage points for only 3 measures, all of which showed better performance for white enrollees in the United States.

Compared with Hispanic enrollees in the United States, Hispanic enrollees in Puerto Rico did not have significantly better performance for any measures, had significantly worse

performance for 15 measures, and had statistically similar performance for 2 measures. The magnitude of the difference between Hispanics in the United States and those in Puerto Rico exceeded 5 percentage points for 13 measures. Hispanics in Puerto Rico fared particularly poorly on measures related to control of cholesterol and HbA<sub>1c</sub> as well as appropriate drug therapy in COPD and rheumatoid arthritis. For each of these measures, Hispanics in Puerto Rico had performance rates that were 16.6 to 37.0 percentage points lower than their Hispanic and white counterparts residing in the United States.

### Adjusted Differences

Adjusted differences between white and Hispanic enrollees in the United States are reported in Table 3. When adjusted for age and sex, differences in performance rates between whites and Hispanics were significant for 9 quality measures. Absolute percentage point differences in performance ranged from 2.3% to 6.6%, but only 3 adjusted differences exceeded 5 percentage points. After adjusting for age, sex, and poverty, Hispanics in the United States had significantly worse quality of care in 2 of the 17 measures, and the gap exceeded 5 percentage points for just 1 indicator: use of antirheumatic drug therapy (−5.1 percentage points; 95% CI, −8.8 to −1.4). For 5 measures, Hispanic MA enrollees had significantly better performance than their US counterparts. Of these 5, the gap favored Hispanic MA enrollees by more than 5 percentage points for 1 measure: breast cancer screening (6.8 percentage points; 95% CI, 4.9–8.8).

In analyses adjusted for age and sex (Table 4), we observed that performance among Hispanic enrollees in Puerto Rico relative to Hispanic enrollees in the United States was significantly worse for 12 measures. Absolute differences for these measures ranged from 5.3 percentage points (95% CI, −9.7 to −0.8) for blood pressure control and nephropathy screening (95% CI, −7.2 to −3.4) to 31.1 percentage points (95% CI, −38.3 to −23.8) for antirheumatic drug therapy. After further adjustment for the rate of poverty, Hispanic MA enrollees in Puerto Rico received worse quality of care for 10 measures compared with care quality among Hispanic MA enrollees in the United States. All of these gaps exceeded 5 percentage points. Antirheumatic drug therapy continued to be the quality indicator with the greatest difference between these 2 groups (23.8 percentage points; 95% CI, −30.9 to −16.8).

Hispanic MA enrollees in Puerto Rico had the lowest performance rates for 8 measures when compared with performance rates among Hispanic enrollees in California, Arizona, Florida, New York, and Texas ( $P < .01$ ) (eTable 2 in the Supplement). The largest disparities between Puerto Rico and these 5 states were evident in LDL-C control and use of appropriate drugs in rheumatoid arthritis and COPD. In addition, after restricting the sample to for-profit plans, Hispanics in Puerto Rico had significantly worse performance for 12 of the 17 measures compared with performance for Hispanics in the United States ( $P < .01$ ) (eTable 3 in the Supplement).

### Discussion

In this national study of the quality of care for white and Hispanic MA enrollees, we found modest differences in the quality of care between white and Hispanic MA enrollees in the



United States and dramatic differences in quality of care for enrollees in Puerto Rico compared with their US counterparts. For 15 of the 17 measures examined, Hispanic MA enrollees in Puerto Rico showed substantially lower performance than did Hispanic MA enrollees in the United States, with absolute differences in performance ranging from 2.2 to 31.3 percentage points. These results largely persisted after adjustments for age, sex, and poverty. Furthermore, our stratified analysis showed that Hispanic MA enrollees in Puerto Rico have the worst quality of care for 8 measures compared with the 5 states with the highest number of Hispanic MA enrollees: California, Arizona, Florida, New York, and Texas.

One key finding in the present study is the pivotal role of Puerto Rican MA plans in serving Hispanic enrollees. Approximately 25.1% of all Hispanics in the MA program live in Puerto Rico, and more Hispanic enrollees reside in Puerto Rico than in any state. Understanding ethnic disparities between white and Hispanic Medicare enrollees at a national level must include consideration of Puerto Rican residents.

The magnitude of the disparity between Hispanics in the United States and those in Puerto Rico varied widely by measure. We detected the highest differences for appropriate drug use in coronary artery disease, rheumatoid arthritis, and COPD, as well as outcome measures that typically require sustained adherence to drug therapy (control of HbA<sub>1c</sub> and LDL-C levels). Although 99.5% of the MA beneficiaries in Puerto Rico have Medicare Part D, the fully adjusted model showed that Hispanics in Puerto Rico had rates of disease-modifying anti-rheumatic drug therapy, systemic corticosteroid treatment, and bronchodilator therapy that were 21.3 to 23.8 percentage points lower than those of Hispanic enrollees in the United States. Compared with their US counterparts, Hispanic enrollees with diabetes mellitus in Puerto Rico were 9.4 percentage points less likely to have controlled LDL-C levels. Similar results were found for control of LDL-C levels in cardiovascular care, with control being 13.3 percentage points less likely for Hispanic enrollees in Puerto Rico compared with their US counterparts.

Prior studies<sup>28,29</sup> have found worse quality of care for racial minorities in MA plans. We extend this work to demonstrate substantial disparities among the Hispanic population depending on Puerto Rican residence. These findings reinforce the results of other studies demonstrating worse quality of care in Puerto Rico.<sup>30,31</sup> Nunez-Smith and colleagues<sup>30</sup> found that patients in the US territories hospitalized for acute myocardial infarction, congestive heart failure, and pneumonia experienced higher 30-day, risk-standardized mortality rates compared with those hospitalized in the United States. Similarly, Elliot and colleagues<sup>31</sup> found that Medicare beneficiaries in Puerto Rico reported worse health care experiences compared with beneficiaries in the United States. These prior studies suggest that the quality gaps that we observed may not be specific to MA but may reflect broader deficits in care delivery in Puerto Rico.

Our study has several implications for policy and future research. First, as documented in a recent General Accounting Office report,<sup>5</sup> MA plans in Puerto Rico face distinct financing constraints, and the Affordable Care Act will intensify these challenges. Puerto Rican MA plans receive per-capita payments that are about 60% of the average benchmark in the

United States. However, these payments are 180% larger than the estimated costs of care for these enrollees in Puerto Rico's traditional Medicare program.<sup>13</sup> The Affordable Care Act seeks to align payments between MA and traditional Medicare, which will result in an 11% payment cut to Puerto Rican MA plans in 2016. These cuts may further erode quality of care, particularly if they lead to reduced access, increased cost-sharing, or restricted benefits.

Second, in 2012, the Centers for Medicare & Medicaid Services instituted a pay-for-performance scheme that pays MA plans bonuses for achieving higher star ratings and initiates penalties for low star ratings (based on HEDIS and other quality measures).<sup>32</sup> It may be difficult for MA plans in Puerto Rico to compete with US plans when the island's poverty rate is 3 times greater than the rate in the United States, its MA payment rates are 30% lower than those of the state with the lowest payment rate (Alabama), and its Medicaid and low-income assistance programs are less generously funded. Finally, we demonstrate the importance of including enrollees from Puerto Rico when studying disparities in the Medicare program and highlight the need for further study on measures and strategies to improve health care quality in Puerto Rico.

Our study has limitations. First, we lacked detailed information about enrollees' chronic conditions, individual-level measures of socioeconomic status, participation in Medicaid, or disease self-management practices. It is possible that these unobserved characteristics may mediate some of the differences we found between Hispanics in Puerto Rico and those in the United States. However, our measures mirror publicly reported HEDIS performance rates that are also not adjusted for these characteristics. Second, Hispanics in the United States come from diverse ethnic and cultural backgrounds and may have different attitudes and behaviors regarding health. We were unable to characterize the Hispanic subpopulations in our study; however, our data show that Hispanics in New York (the state with the highest percentage of Hispanics who are Puerto Rican)<sup>27</sup> received better quality of care in 14 of the 17 measures.

Third, we focused on MA enrollees and could not assess ethnic disparities in the quality of care in traditional Medicare. However, prior research<sup>33</sup> suggests that performance of these measures is better in the MA program compared with traditional Medicare. Fourth, we lacked information on the organizational characteristics of providers in Puerto Rico, which could mediate the quality of health care. Fifth, approximately 5% of MA enrollees receive care in the Veterans Affairs health care system; MA plans may not accurately capture quality data for these individuals.<sup>34,35</sup> Finally, it is plausible that HEDIS performance data from Puerto Rico MA plans may be less reliable than those in the United States. However, in a prior audit study<sup>36</sup> of the validity of HEDIS data, MA plans in Puerto Rico were more likely to report accurate performance rates than were plans located in the United States.

## Conclusions

We found modest differences in the quality of care between white and Hispanic MA enrollees in the United States but substantially worse quality of care for enrollees in Puerto Rico compared with their US counterparts. Our study highlights significant gaps between federal goals about promoting equity in the Medicare program and the quality of care



delivered to MA enrollees in Puerto Rico. Major efforts are needed to improve quality of care within MA plans on the island to a level equivalent to that of the United States.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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## Key Points

### Question

How does the quality of care provided to Medicare Advantage (MA) enrollees in Puerto Rico compare with care quality in the United States?

### Findings

Hispanic MA enrollees in Puerto Rico received care of lower quality than Hispanics in the United States for 15 of 17 measures, with absolute differences in performance rates ranging from 2.2 percentage points for blood pressure control in diabetes mellitus to 31.3 percentage points for use of disease-modifying antirheumatic drug therapy. A similar performance was noted for white and Hispanic MA enrollees in the United States.

### Meaning

Major efforts are needed to improve care delivery on the island to a level equivalent to that in the United States.

**Table 1**

## Sociodemographic Characteristics of MA Enrollees

Characteristic	United States <sup>a</sup>		Hispanics in Puerto Rico <sup>b</sup>
	Whites	Hispanics	
No. of enrollees	6 289 374	795 039	267 016
Age, mean (SD), y	74.6 (7.2)	74.0 (6.7)	74.0 (7.1)
Women, No. (%)	3 651 016 (58.1)	447 782 (56.3)	152 205 (57.0)
Enrolled in Medicare Part D, No. (%)	6 063 963 (96.4)	81 556 (98.3)	265 623 (99.5)
Income below the federal poverty level, median (IQR), % <sup>c</sup>	10.7 (6.7–15.9)	16.3 (11.0–53.8)	47.9 (37.4–53.8)
Enrollees, by quality measure category, No. (%)			
Comprehensive diabetes mellitus care	115 016 (1.6)	26 224 (3.3)	5964 (2.2)
Cardiovascular care	239 489 (3.8)	34 999 (4.4)	7976 (3.0)
Appropriate drug use	6 197 669 (98.5)	792 616 (99.7)	266 607 (99.8)
Cancer screening	833 860 (13.3)	91 308 (11.5)	25 767 (9.6)

Abbreviations: IQR, interquartile range; MA, Medicare Advantage.

<sup>a</sup>All *P* values for comparison between white and Hispanic enrollees were significant at *P* < .001.

<sup>b</sup>All *P* values for comparison between Hispanic enrollees in the US and Puerto Rico were significant at *P* < .001.

<sup>c</sup>Percentage of individuals in the enrollees' zip code area whose household income in the past 12 months was below the federal poverty level.

**Table 2**

Unadjusted Performance Rates for US White, US Hispanic, and Puerto Rican Hispanic Enrollees in MA Plans

Characteristic	Performance Rates, %		
	US		
	Whites	Hispanics	Hispanics in Puerto Rico
Comprehensive diabetes mellitus care			
Annual HbA <sub>1c</sub> testing (n = 144 167)	92.3	92.3	84.5 <sup>a</sup>
HbA <sub>1c</sub> >9% (n = 144 112)	25.7	27.2 <sup>b</sup>	47.5 <sup>a</sup>
Retinal eye examination (n = 137 920)	65.9	66.6 <sup>c</sup>	55.0 <sup>a</sup>
Annual LDL-C testing (n = 144 625)	89.1	90.4 <sup>b</sup>	90.9
LDL-C <100 mg/dL (n = 144 570)	54.5	53.1 <sup>b</sup>	36.5 <sup>a</sup>
Nephropathy screening (n = 146 746)	89.7	92.8 <sup>b</sup>	87.5 <sup>a</sup>
BP control <140/90 mm Hg (n = 136 093)	61.1	58.6 <sup>b</sup>	56.4 <sup>d</sup>
Cardiovascular care			
LDL-C testing after coronary event (n = 136 116)	91.4	94.0 <sup>b</sup>	91.6 <sup>a</sup>
LDL-C <100 mg/dL after coronary event (n = 136 116)	64.0	65.4 <sup>b</sup>	37.5 <sup>a</sup>
BP control <140/90 mm Hg in hypertension (n = 122 741)	64.2	61.3 <sup>b</sup>	56.1 <sup>a</sup>
β-Blocker treatment after MI (n = 32 752)	88.9	87.4 <sup>b</sup>	78.4 <sup>a</sup>
Appropriate drug use			
Receipt of 1 high-risk medication (n = 7 249 479)	16.8	19.1 <sup>b</sup>	24.2 <sup>a</sup>
Use of disease-modifying antirheumatic drug therapy (n = 85 011)	76.9	71.2 <sup>b</sup>	39.9 <sup>a</sup>
Use of systemic corticosteroid in COPD exacerbation (n = 51 623)	67.4	61.5 <sup>b</sup>	37.7 <sup>a</sup>
Use of bronchodilator therapy in COPD exacerbation (n = 51 623)	75.8	78.4 <sup>b</sup>	52.9 <sup>a</sup>
Cancer screening			
Colorectal (n = 315 258)	62.9	57.3 <sup>b</sup>	59.0
Breast (n = 706 376)	74.8	79.6 <sup>b</sup>	72.3 <sup>a</sup>

Abbreviations: BP, blood pressure; COPD, chronic obstructive pulmonary disease; HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>; LDL-C, low-density lipoprotein cholesterol; MA, Medicare Advantage; MI, myocardial infarction.

SI conversion factors: To convert HbA<sub>1c</sub> to a proportion of total Hb, multiply by 0.01; LDL-C to millimoles per liter, multiply by 0.0259.

<sup>a</sup>Difference in the rate for Hispanic enrollees in the United States vs that of Hispanic enrollees in Puerto Rico was significant at  $P < .01$ .

<sup>b</sup>Difference in the rate for white enrollees vs that of Hispanic enrollees in the United States was significant at  $P < .01$ .

<sup>c</sup>Difference in the rate for white enrollees vs that of Hispanic enrollees in the United States was significant at  $P < .05$ .

<sup>d</sup>Difference in the rate for Hispanic enrollees in the United States vs that of Hispanic enrollees in Puerto Rico was significant at  $P = .03$ .



**Table 3**

Adjusted Absolute Differences in Performance Rates Between US White and Hispanic MA Enrollees

Characteristic	Absolute Difference, Adjusted (95% CI), Percentage Points	
	Adjusted for Age and Sex	Adjusted for Age, Sex, and Poverty
Comprehensive diabetes mellitus care		
Annual HbA <sub>1c</sub> testing (n = 140 780)	-0.1 (-1.2 to 1.1)	0.6 (-0.4 to 1.6)
HbA <sub>1c</sub> >9% (n = 140 725)	1.6 (-3.6 to 6.7)	-1.6 (-6.4 to 3.1)
Retinal eye examination (n = 134 533)	0.5 (-3.7 to 4.8)	3.3 (-0.4 to 7.0)
Annual LDL-C testing (n = 141 238)	1.2 (0.0 to 2.5)	2.2 (1.1 to 3.4)
LDL-C <100 mg/dL (n = 141 183)	-1.1 (-4.5 to 2.4)	1.8 (-1.7 to 5.3)
Nephropathy screening (n = 140 782)	3.1 (2.0 to 4.3)	3.2 (2.0 to 4.5)
BP control <140/90 mm Hg (n = 132 706)	-2.7 (-6.0 to 0.5)	-0.3 (-4.1 to 3.4)
Cardiovascular care		
LDL-C testing after coronary event (n = 132 965)	2.5 (1.7 to 3.4)	3.4 (2.6 to 4.2)
LDL-C <100 mg/dL after coronary event (n = 132 965)	1.8 (-2.5 to 6.2)	4.4 (0.1 to 8.7)
BP control <140/90 mm Hg in hypertension (n = 119 047)	-2.8 (-4.7 to -0.9)	-0.9 (-2.8 to 1.0)
β-Blocker treatment after MI (n = 31 425)	-1.3 (-3.0 to 0.3)	-1.6 (-3.3 to 0.1)
Appropriate drug use		
Receipt of 1 high-risk-medication (n = 6 983 239)	2.3 (0.1 to 4.6)	1.4 (-0.8 to 3.7)
Use of disease-modifying antirheumatic drug (n = 80 540)	-6.6 (-10.2 to -2.9)	-5.1 (-8.8 to -1.4)
Use of systemic corticosteroid in COPD exacerbation (n = 49 755)	-5.2 (-8.0 to -2.3)	-4.1 (-6.9 to -1.2)
Use of bronchodilator therapy in COPD exacerbation (n = 49 755)	2.9 (0.1 to 5.5)	4.1 (1.4 to 6.7)
Cancer screening		
Colorectal (n = 311 601)	-5.6 (-11.3 to 0.0)	-2.4 (-8.0 to 3.2)
Breast (n = 683 411)	4.8 (2.8 to 6.8)	6.8 (4.9 to 8.8)

Abbreviations: BP, blood pressure; COPD, chronic obstructive pulmonary disease; HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>; LDL-C, low-density lipoprotein cholesterol; MA, Medicare Advantage; MI, myocardial infarction.

SI conversion factors: To convert HbA<sub>1c</sub> to a proportion of total Hb, multiply by 0.01; LDL-C to millimoles per liter, multiply by 0.0259.

**Table 4**

Adjusted Absolute Differences in Performance Rates Between US Hispanic and Puerto Rican Hispanic MA Enrollees

Characteristic	Absolute Difference, Adjusted (95% CI), Percentage Points	
	Adjusted for Age and Sex	Adjusted for Age, Sex, and Poverty
Comprehensive diabetes mellitus care		
Annual HbA <sub>1c</sub> testing (n = 29 322)	-7.7 (-9.6 to -5.8)	-5.6 (-7.7 to -3.5)
HbA <sub>1c</sub> >9% (n = 29 299)	20.2 (10.3 to 30.2)	10.4 (-0.4 to 21.1)
Retinal eye examination (n = 29 103)	-11.6 (-17.5 to -5.7)	-7.8 (-15.9 to -0.4)
Annual LDL-C testing (n = 29 606)	0.6 (-0.9 to 2.0)	2.3 (0.8 to 3.9)
LDL-C <100 mg/dL (n = 29 586)	-16.6 (-22.5 to -10.6)	-9.4 (-15.6 to -3.2)
Nephropathy screening (n = 31 901)	-5.3 (-7.2 to -3.4)	-6.2 (-8.2 to -4.3)
BP control <140/90 mm Hg (n = 24 584)	-2.0 (-8.4 to 4.5)	0.1 (- 6.6 to 6.8)
Cardiovascular care		
LDL-C testing after coronary event (n = 19 848)	-2.4 (-4.9 to 0.1)	0.9 (-0.9 to 2.7)
LDL-C <100 mg/dL after coronary event (n = 19 848)	-27.2 (-39.6 to -14.8)	-13.3 (-20.9 to -5.7)
BP control <140/90 mm Hg in hypertension (n = 19 628)	-5.3 (-9.7 to -0.8)	-2.5 (-7.7 to 2.7)
β-Blocker treatment after MI (n = 4903)	-9.2 (-12.4 to -6.1)	-8.6 (-13.4 to -3.8)
Appropriate drug use		
Receipt of 1 high-risk-medication (n = 1 058 260)	5.2 (-3.9 to 14.2)	2.7 (-6.3 to 11.7)
Use of disease-modifying antirheumatic drug (n = 15 100)	-31.1 (-38.3 to -23.8)	-23.8 (-30.9 to -16.8)
Use of systemic corticosteroid in COPD exacerbation (n = 5504)	-23.6 (-27.6 to -19.6)	-21.3 (-27.5 to -15.1)
Use of bronchodilator therapy in COPD exacerbation (n = 5504)	-25.0 (-28.9 to -21.1)	-22.7 (-27.7 to -17.6)
Cancer screening		
Colorectal (n = 25 834)	1.7 (-3.9 to 7.4)	12.5 (5.9 to 19.2)
Breast (n = 97 058)	-7.3 (-12.0 to -2.5)	-3.4 (-7.6 to 0.8)

Abbreviations: BP, blood pressure; COPD, chronic obstructive pulmonary disease; HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>; LDL-C, low-density lipoprotein cholesterol; MA, Medicare Advantage; MI, myocardial infarction.

SI conversion factors: To convert HbA<sub>1c</sub> to a proportion of total Hb, multiply by 0.01; LDL-C to millimoles per liter, multiply by 0.0259.