Influence of Usual Source of Care on Differences by Race/Ethnicity in Receipt of Preventive Services

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OBJECTIVE: We examined the relation between race/ethnicity and receipt of preventive services and the effect of having a usual source of care (USOC) on receipt of preventive services in different racial and ethnic groups.

DESIGN/PARTICIPANTS: We analyzed data from adults, aged 18 to 64 years in the Household Component of the 1996 Medical Expenditure Panel Survey, a nationally representative survey of health care use for the United States.

MEASUREMENTS: The proportion of adults who received age-appropriate preventive services.

RESULTS: Compared to white respondents, Hispanics were less likely to receive breast exams and blood pressure and cholesterol screening than were white respondents, and blacks were more likely to report receiving a Pap smear. Despite being less likely to report having a USOC, black and Hispanic women were as likely or more likely to report receiving breast and cervical cancer screening, after controlling for having a USOC and other factors. Hispanics reported receiving blood pressure screening less often, and blacks reported receiving more cholesterol screening. For each race/ethnicity group, having a USOC was associated with receiving preventive services. However, controlling for USOC and other confounders attenuated, but did not eliminate, differences by race/ethnicity.

CONCLUSION: The differences by race in receipt of preventive services suggest the need for different starting points for devising strategies to address racial differences in disease outcomes. While having a USOC will be important in narrowing the differences by race in receipt of preventive services, attending to other factors that contribute to disparities in health will also be essential.

KEY WORDS: race/ethnicity; preventive services; usual source of care.

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In the United States, racial disparities in health are well documented, with morbidity and mortality significantly higher among African Americans and Hispanics in comparison with white populations for many preventable or

treatable illnesses.¹ The Presidential Initiative on Race includes the objective of eliminating racial disparities in 6 areas of health outcomes: cancer, cardiovascular disease, immunization, diabetes, infant mortality, and HIV/AIDS. These areas parallel the goals outlined by the Department of Health and Human Services in Healthy People 2010.¹ An important strategy in addressing these goals is to understand to what extent disparities exist in receipt of health services, the reduction of which might prevent or ameliorate differences in health outcomes.

Differential care by race/ethnicity has been highlighted in the use of highly technical or other inpatient services, where African-American patients have been shown to be less likely to receive these services than white patients with similar clinical histories.²⁻⁸ However, analyses of both inpatient and outpatient services have focused primarily on differences by races among older patients, often Medicare beneficiaries.^{2-5,8-11} In addition, only a limited number of reports of national data on preventive services have included patients of Hispanic ethnicity.^{12,13}

Although it is generally accepted that having a usual source of care (USOC) may facilitate receiving needed health care, there is evidence that provider prescription of certain health services can vary by the race/ethnicity of the patient.¹⁴⁻¹⁶ It is possible that having a USOC may not be as important a predictor of receipt of health services for racial and ethnic minorities as it is for white Americans.^{17,18} Reports that have examined the impact of having a USOC on preventive services for ethnic minorities have focused on a limited number of preventive services (e.g., female cancer screening) in 1 region or clinic, or did not make comparisons across race/ethnic group.¹⁹⁻²¹ To our knowledge, no authors have examined the possible influence of having a USOC on racial differences in a broad spectrum of adult preventive services in men and women. We undertook these analyses to examine the relation between race/ethnicity and receipt of preventive services and to determine the effect of having a USOC on receipt of preventive services in different racial and ethnic groups.

METHODS

The Medical Expenditure Panel Survey

We used data from the 1996 Medical Expenditure Panel Survey (MEPS) for these analyses. The MEPS is a nationally representative survey of patterns of health care use for the U.S. civilian noninstitutionalized population. Cosponsored by the Agency for Healthcare Research and Quality and the National Center for Health Statistics, the MEPS sample was drawn from a nationally representative

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subsample of households that participated in the National Health Interview Survey.^{22,23}

The Household Component (HC) is 1 of 4 components that comprise the MEPS. Data were collected through a combination of computer-assisted in-person interviews, telephone interviews, and mailed surveys at both the person and household levels. The 1996 HC collected data on approximately 10,000 families and 24,000 persons in the civilian, noninstitutionalized population of the United States in 195 communities across the nation.^{22,23}

Although data were collected over the course of a year, for these analyses the data were collapsed and weighted to provide estimates for a cross-section of the population on December 31, 1996. A person-level weight was developed by the data editors to adjust for nonresponse and post-stratification to population control figures reflecting the Census Bureau estimated population distribution across age and sex categories as of December 1996. A subset of the HC data was created for these analyses to include information only from those individuals between age 18 and 64 at the time the preventive services of interest would have been received. Observations were excluded from the analysis dataset only if the data for race/ethnicity and/or regular source of care were missing. Of the 21,326 participants in the 1996 HC, 12,040 were 18 to 64 years old at the time preventive services would have been received. Of these, 22 were missing data for USOC and 428 observations were excluded in which race/ethnicity was coded as missing or "other," leaving 11,557 observations for the analyses.

Measures

Dependent Factors: Preventive Services. Each preventive service was assessed as a dichotomous outcome using the 1996 U.S. Preventive Services Task Force Guidelines.²⁴ The populations for each preventive service were identified on the basis of gender and age guidelines and are detailed below. We chose to use conservative age cut-offs in order to accommodate the temporality of the questions in the survey. For example, the mammography question in the MEPS interview asks women whether they had received a mammogram in the past 2 years. We thought it was appropriate to limit our population to women aged 52 and above, because younger women would not have been in the appropriate age range for recommended mammography (i.e., 50 years or older) at the time the survey was

conducted. The populations examined for each preventive service are shown in Table 1.

Independent Factors. Race/ethnicity and USOC were assessed as independent predictors of receipt of preventive services in these analyses. We created a 3-level race/ethnicity variable (white, not of Hispanic origin; black, not of Hispanic origin; and Hispanic). Although the MEPS included participants other than non-Hispanic white, black, and Hispanic, we chose to exclude these other groups from our analyses, as this "other" group would have contained a mixture of several different ethnic groups. We created a 2-level USOC variable (yes, no) based on whether a respondent reported that they had a "particular doctor's office, clinic, health center, or other place that (person) usually (goes) if (person) is sick or needs advice about (person's) health." A small number ($n = 63$) of respondents indicated that they had a USOC but identified the USOC as a hospital emergency department, and were coded as having no USOC because a hospital emergency department is not usually equipped to provide routine or preventive care.

Health insurance, educational status, and employment are factors that are thought to influence the relation between race/ethnicity and health care utilization, and were used as adjustment factors in these analyses, in addition to age. Their inclusion may control, in part, for the effect of socioeconomic status on the use of preventive services. A 4-level insurance variable (uninsured, Medicare, Medicaid, private health insurance) was created, based on respondents reported insurance type at any point during 1996. Respondents who were covered by Champus were included in the private health insurance category. A 3-level educational status variable (less than high school, high school graduate, any college) was used. The 2-level employment variable (employed, unemployed) was based on a factor created for the MEPS, which defined respondents as employed if they were employed for pay at the time of the interview, or were not employed but had a job to return to. Finally, we created a 4-level age variable (20 to 24, 25 to 34, 35 to 49, and 50 to 64) that corresponded to the different populations for each of our preventive services.

Statistical Methods

Weighted frequencies, proportions, and Pearson χ^2 tests of statistical significance for each preventive service

Table 1. Preventive Service Populations

	Gender	Age, Y	N	Weighted N	Time Frame, y
Mammography	Female	52+	1,237	15,018,484	2
Pap smear	Female	20+	5,975	73,714,924	2
Breast exam	Female	23+	5,585	68,556,457	5
Blood pressure	Male and female	23+	10,646	135,122,761	5
Cholesterol screen	Male and female	40+ and 50+, respectively	4,055	52,320,380	5

and independent factor, by race/ethnicity, were estimated using the FREQ procedure in SAS version 6.12 (SAS Institute, Cary, NC).²⁵ To accommodate the complex sampling and survey design in MEPS, we used the software packages SUDAAN version 7.52 (Research Triangle Institute, Research Triangle Park, NC) and STATA 7.0 (STATA Press, College Station, Tex) to adjust for design effects. These software applications incorporated the appropriate population weights and also accounted for the survey sample design with similar results. The statistical significance of the relations between receipt of each preventive service and race/ethnicity was assessed in crude and adjusted models using the Wald χ^2 test.²⁶

Modification of the association between race/ethnicity and each preventive service by USOC (i.e., interaction) was assessed with simple logistic regression models that incorporated a race/ethnicity*USOC term and used the Wald z test of significance.²⁶ The interactions between race/ethnicity and all of the other adjustment factors were similarly examined in simple models. Several interaction terms were found to be statistically significant, and these interaction terms were next tested individually using full logistic regression models that incorporated all of the other independent factors. The addition of multiple interaction terms to the full models was not feasible, producing unstable results despite the relatively large number of total survey participants. Finally, using logistic regression, we examined the predictors of receipt of each preventive service within each race/ethnicity stratum. We used the β coefficients from the logistic regression models to calculate adjusted proportions for each preventive service.

RESULTS

Table 2 summarizes the national estimates of each of the sociodemographic variables stratified by ethnic group for the 1996 adult noninstitutionalized population included in the current analysis. We found that whites were older, more likely to have completed any college, most likely to have private insurance, and most likely to report having a USOC. Minorities were younger, reported less educational attainment, were less likely to be insured, and were less likely to report having a USOC.

In unadjusted analyses, having a USOC was significantly associated with receipt of all preventive services (Table 3). Persons with higher educational attainment and those with private insurance were more likely to receive each of the preventive services examined. Women were more likely to receive blood pressure and cholesterol screening.

We next calculated adjusted crude and adjusted proportions to examine whether controlling for usual source of care, insurance status, age, education and employment (i.e., whether there was a similar distribution of these variables across race/ethnic groups) influenced the proportion of individuals who reported receipt of each preventive service (Table 4). After adjusting for usual source of care and other confounders, differences by race/ethnicity in the receipt of preventive services were attenuated. However, regardless of adjustment for confounders, blacks were more likely to receive a Pap smear and cholesterol screening and Hispanics were less likely to receive blood pressure screening. In addition, there was no statistically significant interaction between race/

Table 2. U.S. Population Characteristics Stratified by Race/Ethnicity

	Total	White	Black	Hispanic
Weighted N	148,000,000	113,000,000	18,000,000	16,000,000
Age, y, %* [†]				
20–24	11	10	14	15
25–34	26	28	34	26
35–49	40	41	40	35
50–64	23	25	19	16
Sex, %* [†]				
Male	49	49	45	51
Female	51	51	55	48
Education, %* [†]				
Less than high school	13	9	17	39
High school graduate	55	55	61	45
Any college	32	36	21	16
Insurance, %* [†]				
Uninsured	20	16	27	40
Private	73	79	58	48
Medicaid [‡]	6	4	12	11
Medicare [‡]	2	2	3	2
Employed, %	85	86	81	79
With usual source care, % [†]	76	79	74	60

* Percent weighted to the adult noninstitutionalized U.S. population.

[†] P < .01 for comparisons across race/ethnic groups.

[‡] 1% of white, Hispanic, and the total population and 2% of blacks had insurance through both Medicaid and Medicare.

Table 3. National Estimates* of the Proportion of U.S. Adults Who Have Received Each Preventive Service Stratified by Usual Source of Care (USOC), Age, Sex, Education, Insurance Status, and Employment

	Mammography [†]	Pap Smear [‡]	Breast Exam [§]	Blood Pressure	Cholesterol Screen [¶]
USOC					
Yes	75	80	89	95	80
No	49	66	74	82	51
Age, y					
20–24	—	75	80	89	—
25–34	—	83	87	91	—
35–49	—	78	87	93	66
50–64	72	73	86	94	80
Sex					
Male	—	—	—	88	71
Female	72	78	87	96	82
Education					
Less than high school	57	63	74	86	69
High school grad	73	77	86	92	73
Any college	84	85	92	95	81
Insurance					
Uninsured	51	63	75	84	55
Private	78	82	90	94	79
Medicaid	58	74	77	94	75
Medicare	60	63	72	91	83
Employed					
Yes	75	79	88	92	73
No	69	72	82	93	82

* Percent weighted to the adult noninstitutionalized U.S. population.

[†] Mammography population: all women aged 52 and older; weighted sum = 15,180,305.

[‡] Pap smear population: all women aged 20 and older; weighted sum = 75,273,099.

[§] Breast exam population: all women aged 23 and older; weighted sum = 70,106,393.

^{||} Blood pressure population: all men and women aged 23 and older; weighted sum = 137,362,704.

[¶] Cholesterol screen population: all men aged 40 and older, and all women aged 50 and older; weighted sum = 53,327,639.

ethnicity and USOC for any of the preventive services (i.e., the associations between race/ethnicity and receipt of each preventive service were not modified by the presence or absence of a USOC). We also examined predictors of each preventive service within each race/ethnicity stratum (data not shown). For mammogram, breast exam, blood pressure screening, cholesterol screening and Pap smear, having a USOC was the strongest independent predictor within each race/ethnicity subgroup.

DISCUSSION

In this nationally representative sample, we found bi-directional racial differences in receipt of preventive services. Despite being less likely to report having a usual source of care, black and Hispanic women were as likely or more likely to report receiving breast and cervical cancer screening than white women. In contrast, Hispanics reported receiving blood pressure screening less often than whites and blacks reported receiving cholesterol screening more often. In addition, for each race/ethnicity, having a USOC was strongly and independently associated with receiving preventive services, even after controlling for other factors. However, controlling for USOC and other confounders attenuated, but did not eliminate, differences by race in receipt of each preventive service.

Despite an increasing body of literature describing racial disparities in health care, we found less racial variation between whites and nonwhites in receipt of female preventive services. The results we report are supported by other data that have shown comparable and increasing rates of breast and cervical screening services over the last decade.^{12,27–29} These trends may be in part due to increased public awareness since the 1980s of the importance of timely breast and cervical cancer screening. The rates we and others report may also reflect national initiatives such as Healthy People 2000 and the National Breast and Cervical Cancer Early Detection Program, which have focused professional attention on female cancer screening.^{30,31} However, despite remediation of racial differences in female screening, differences by race/ethnicity and socioeconomic status still remain for survival for breast and cervical cancers.^{32,33}

Consistent differences by race/ethnicity have been documented for the primary and secondary prevention of vascular diseases. Other authors have described that despite a higher prevalence of hypertension in certain subgroups, Hispanics are less likely to receive hypertensive care and less likely to have adequate blood pressure control.^{34,35} However, our findings of more cholesterol screening among black patients are in conflict with results reported by other authors. Patients of white race and those

Table 4. Crude and Adjusted Proportions for Effect of Race/Ethnicity on Receipt of Each Preventive Service, Weighted to the Adult Noninstitutionalized U.S. Population

	White	Black	Hispanic
Unadjusted proportions receiving each preventive service			
Mammography	73	71	72
Pap smear	78	82*	72 [†]
Breast exam	87	86	81 [‡]
Blood pressure	93	92	85 [‡]
Cholesterol screen	75	79	68 [‡]
Adjusted proportions receiving each preventive service [§]			
Mammography	75	74	77
Pap smear	80	84*	77*
Breast exam	75	75	73
Blood pressure	82	80	73 [‡]
Cholesterol screen	80	84	78
Adjusted proportions receiving each preventive service (including usual source of care) [§]			
Mammography	66	70	74
Pap smear	77	83*	78
Breast exam	90	91	90
Blood pressure	93	92	90 [‡]
Cholesterol screen	60	69*	62

* ≤ 0.05 , for differences in proportions compared to the proportion of Whites receiving each preventive service.

[†] ≤ 0.01 , for differences in proportions compared to the proportion of Whites receiving each preventive service.

[‡] ≤ 0.001 , for differences in proportions compared to the proportion of Whites receiving each preventive service.

[§] Logistic regression models were adjusted for age, education, employment, insurance status, and sex.

^{||} Mammography, Pap smear and breast exam not adjusted for sex.

that held private insurance, rather than Medicaid, have been reported to have the highest likelihood of receiving cholesterol screening.³⁶⁻³⁸ In trying to reconcile our findings, we wondered if clustering of cardiovascular risk factors might help explain higher levels of cholesterol screening, since clinicians evaluate a patient's cardiovascular risk, including the presence of other conditions that may put patients at higher risk of disease.³⁹ Given that a history of hypertension may be considered an indication for cholesterol screening, we examined the association between blood pressure and cholesterol screens. In fact, in regression models, having had blood pressure screening was the most powerful predictor of cholesterol screening, more powerful than having a USOC.

In addition, our finding of an absence of interaction between race/ethnicity and having USOC (i.e., having a USOC was associated with receiving preventive services, regardless of race/ethnic group) suggests that improving access to a regular source of care may be an important step in improving receipt of preventive services by all racial and ethnic groups. Respondents who identified a USOC were 2 to 3 times more likely to receive the examined preventive services. However, it is not clear from these analyses, or

from the literature, how or whether the type of provider might further influence the relation between race/ethnicity and the receipt of preventive services. Others have shown that having a regular source of care may be the most important factor in receiving preventive services.^{9,19,21,40-42} However, there is evidence that providing entry into the health system without continuity or other elements of primary care may not be sufficient to ensure receipt of preventive services.^{43,44} O'Malley reported that in the setting of female cancer screening, higher levels of cancer screening are associated with greater levels of continuity of care among uninsured ethnic minority women.¹⁹ Although these data highlight the role of having a USOC in addressing health disparities, because of the limitations of this and other reports, the added impact of a continuous relationship with a specific clinician in improving health outcomes, beyond receiving preventive services, remains unanswered.

Despite the large, nationally representative sample and broad spectrum of preventive services that we were able to examine, this study has limitations. Although the associations we report are strong, the cross-sectional nature of the dataset precludes determining causal relations between race/ethnicity, USOC, and each preventive service. In addition, the HC component of MEPS is based on self-report of receipt of preventive services. There are conflicting data on how well self-reporting of preventive services may correspond with actual utilization.⁴⁵⁻⁴⁷ Self-report of laboratory tests such as cholesterol screening may be especially problematic compared to that of other services because the respondent may not have a clear understanding of which blood tests were ordered.⁴⁸

In addition to the above methodological limitations, although we were able to include Hispanic ethnicity as a variable in our analysis, we were not able to capture the heterogeneity of this or the other race/ethnicity categories. Because of the limitations of MEPS coding, we also realize that in some instances the time periods for receipt of preventive services that we used were approximations of the U.S. Preventive Services Task Force guidelines and could be challenged. To assess the impact, we examined certain preventive services using more strict guidelines and didn't find an important difference in the results. Also, while other authors have attempted to control for the number of comorbid illnesses, we decided, because of the constraints of the dataset and conflicting interpretations in the literature, not to control for comorbid illnesses in our analyses. Finally, our definition of USOC could be disputed by other authors, who describe USOC in broader terms (e.g., including emergency departments) or more narrowly defined terms (e.g., dividing into specific sites where care is sought).

How can these results be used to address disparities in health outcomes? First, we believe it may be instructive to examine why, thus far, we have been successful in reducing disparities in such indicators of access as breast and cervical cancer screening. These successes might

inform the path to eliminating disparities in other indicators and reducing disparities in outcomes for breast and cervical cancer. For example, in reducing morbidity and mortality from breast and cervical cancer, health policies may need to broaden from a focus on screening to include improving access to diagnostic and therapeutic options. In addition, although having a USOC will be important in narrowing the differences by race in receipt of preventive services, attending to other factors that contribute to disparities in health will also be essential.

In conclusion, in a nationally representative sample of U.S. adults, we found a bi-directional pattern of racial differences in receipt of preventive services. Controlling for a usual source of care attenuated differences by race/ethnicity but did not eliminate them. These results highlight the inherently complex task of addressing disparities in health outcomes. To this end, successful and unsuccessful initiatives to improve receipt of preventive services should be closely examined and contrasted. The lessons learned should then be used to construct diverse and distinct strategies to address disparities in health outcomes.

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