

# Statin and Aspirin Use Among Hispanic and Latino Adults at High Cardiovascular Risk: Findings From the Hispanic Community Health Study/Study of Latinos

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**Background**—Despite variations in the prevalence of cardiovascular disease and related risk factors among US Hispanic/Latino adults of diverse backgrounds, there is little information on whether disparities exist in the use of medications for the primary and secondary prevention of cardiovascular disease. We examined the prevalence of statin and aspirin use among diverse US Hispanic/Latino adults at high cardiovascular risk.

**Methods and Results**—A multicenter population-based study, the Hispanic Community Health Study/Study Of Latinos, included a total of 16 415 participants of Mexican, Puerto Rican, Cuban, Dominican, South American, and Central American backgrounds who were aged 18 to 74 years and enrolled between March 2008 and June 2011. Our analyses were limited to 4139 participants considered to be at high cardiovascular risk. Age-adjusted prevalence of statin and aspirin use was 25% and 44%, respectively, overall but varied by Hispanic/Latino background among those at high cardiovascular risk; statin use was significantly higher ( $P<0.001$ ) among adults of Puerto Rican (33%) and Dominican (28%) backgrounds compared with adults of other backgrounds (Mexican, 24%; Cuban, 22%; Central American, 20%; South American, 22%). There was no difference in aspirin use. After adjusting for health insurance coverage, the difference in prevalence of statin use was substantially reduced among participants with a Puerto Rican background, from an odds ratio of 1.73 (95% CI 1.30–2.31) to 1.30 (95% CI 0.97–1.75), and with a Dominican background, from an odds ratio of 1.45 (95% CI 1.04–2.02) to 1.07 (95% CI 0.75–1.52), in comparison to their counterparts.

**Conclusions**—Among Hispanic/Latino adults of diverse backgrounds, statin use was more prevalent among adults with Puerto Rican and Dominican backgrounds at high cardiovascular risk. These differences in statin use were explained, in part, by differences in insurance coverage. These findings have important implications for the prevention of disparities in cardiovascular outcomes within the growing US Hispanic/Latino population. (*J Am Heart Assoc.* 2016;5:e002905 doi: 10.1161/JAHA.115.002905)

**Key Words:** cardiovascular risk • disparities • Hispanic/Latino • statins

Cardiovascular medications such as statins and aspirin are widely used in the United States<sup>1</sup> and are critical for primary and secondary prevention of cardiovascular disease (CVD),<sup>2–5</sup> which is increasingly common in the growing and aging US Hispanic/Latino population. Despite evidence of disparities in CVD and CVD risk factors, including hyper-

cholesterolemia, among adults from the diverse Hispanic/Latino groups that compose the US Hispanic/Latino population,<sup>6</sup> current information on use of medications for the prevention of CVD, including statins and aspirin, is limited.

Despite the benefits of statins and aspirin for the primary and secondary prevention of CVD among adults at high

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Received November 5, 2015; accepted February 8, 2016.

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cardiovascular risk, previous analyses have documented racial and ethnic disparities in their use in the United States.<sup>7,8</sup> These prior analyses, however, aggregated Hispanic/Latino participants into 1 group and thus did not examine the use of statins and/or aspirin by Hispanic/Latino background. Disparities in the use of preventive cardiovascular medications may be an important but overlooked contributor to observed disparities in CVD<sup>6</sup> within the diverse Hispanic/Latino population in the United States.

The study used data from the landmark Hispanic Community Health Study/Study of Latinos (HCHS/SOL) to examine prevalence of cardiovascular medication use among diverse US Hispanic/Latino adults at high cardiovascular risk. Sociodemographic, acculturation, and access-to-care factors associated with cardiovascular medication use were also examined.

## Methods

### Participants

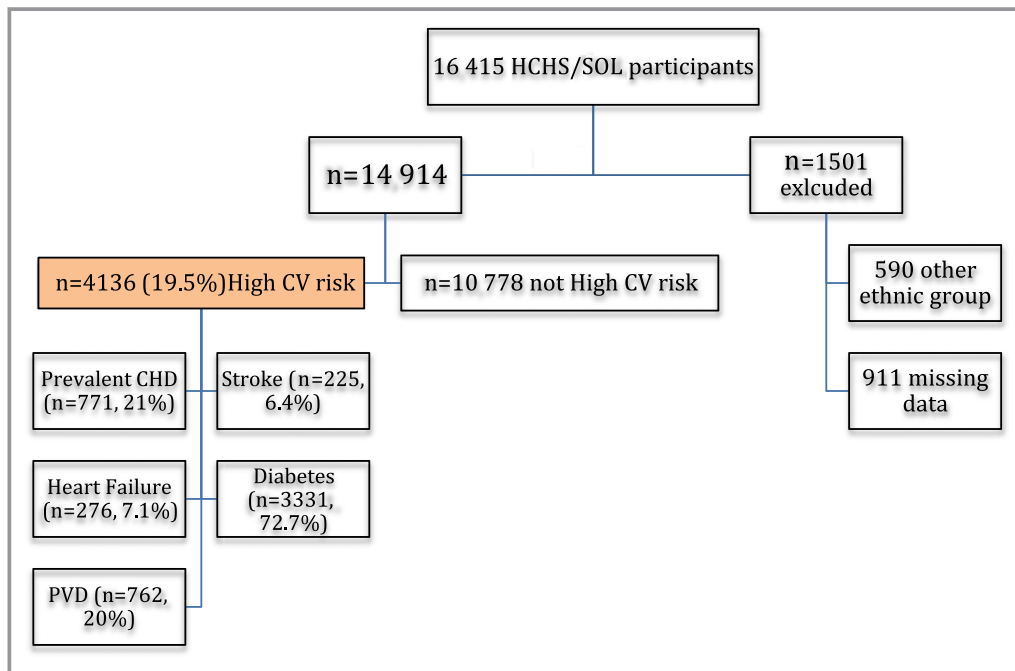
The HCHS/SOL is a population-based cohort study devised to estimate the prevalence of CVD risk factors and to examine the prospective relationship between risk factors and disease outcomes among persons of diverse Hispanic/Latino backgrounds. It included participants of Cuban, Dominican, Mexican, Puerto Rican, Central American, and South American

origins who were recruited from community areas surrounding 4 field centers in the Bronx, New York; Chicago, Illinois; Miami, Florida; and San Diego, California, between March 2008 and June 2011. A stratified, multistage, area probability sample of households was obtained to screen candidates for eligibility. Of 39 384 persons who were screened and selected and who met the eligibility criteria, 16 415 were enrolled for the study. The sample design, cohort selection, and study implementation were described previously.<sup>9</sup> The current analyses excluded 911 participants who were missing information on CVD and 590 participants who did not self-identify as any of the 6 aforementioned Hispanic/Latino groups (Figure 1). Consequently, the analytic sample (n=4136) included data from 14 914 participants. Institutional review boards at each participating institution approved the protocol, and all participants provided written informed consent.

### Data

Data were collected during a baseline examination conducted at examination centers located at each field site and included biological measures, interviewer-administered questionnaires, and a medication inventory.

Body mass index was calculated as weight in kilograms divided by height in meters squared. After a 5-minute rest period, 3 seated blood pressure measurements were



**Figure 1.** Flowchart of participants at high cardiovascular risk who were included in the HCHS/SOL sample. CHD indicates coronary heart disease; CV, cardiovascular; HCHS/SOL, Hispanic Community Health Study/Study of Latinos; PVD, peripheral vascular disease.

obtained, and the second and third readings were averaged. Blood samples were collected according to standardized protocols and analyzed for total serum cholesterol, plasma glucose, high-density lipoprotein, low-density lipoprotein, and hemoglobin A1c levels.

Information was obtained by questionnaires on demographic factors, socioeconomic status (education and income), proxy measures of cigarette smoking, medical history, and insurance status. Acculturation was also assessed using a modified version of the Short Acculturation Scale for Hispanics, which captured the degree of adaptation to new physical, cultural, social, and economic environments; proxy measures of acculturation (years of residence in the United States, nativity, and language preference) were also assessed.<sup>9</sup> Insurance status was derived based on responses to the question, "What type of health insurance or health care coverage do you have?" Responses included the following 4 categories: none, private (employer-sponsored or individual plan), public (Medicare, Medicaid, or military or US Department of Veterans Affairs), or other.

Participants at high cardiovascular risk were defined as those who reported ever being diagnosed with coronary heart disease (CHD; myocardial infarction) or a CHD risk equivalent (stroke, peripheral vascular disease, heart failure, and/or diabetes). The Adult Treatment Panel III guidelines were used to derive our definition of high cardiovascular risk. Participants with CHD or a CHD risk equivalent were considered to be at highest risk (10-year risk >20%) for developing a cardiovascular event.<sup>10</sup> Prevalent CVD was defined as self-reported history of CHD (myocardial infarction, coronary bypass surgery, balloon angioplasty, or stent placement in coronary arteries) or stroke. As illustrated in Figure 1, our analytic sample was restricted to 4136 participants defined as having high cardiovascular risk, which included participants with and without prevalent CVD.

Major CVD risk factors were based on current guidelines. Hypertension was defined as systolic blood pressure of  $\geq 140$  mm Hg, diastolic blood pressure of  $\geq 90$  mm Hg, or receipt of medication for hypertension. Uncontrolled hypercholesterolemia was defined as total cholesterol  $\geq 240$  mg/dL, high-density lipoprotein cholesterol  $< 40$  mg/dL, or low-density lipoprotein cholesterol  $\geq 160$  mg/dL. Obesity was defined as a body mass index  $\geq 30$ , calculated as weight in kilograms divided by height in meters squared. Diabetes mellitus was defined as fasting glucose  $\geq 126$  mg/dL, 2-hour-postload plasma glucose  $\geq 200$  mg/dL, hemoglobin A1c  $\geq 6.5\%$ , use of diabetes medications, or self-reported history of diabetes.

Participants were instructed to bring all prescription and nonprescription medications taken in the past month to the study center at the time of their physical examination. Cardiovascular medication use was defined as the use of at

least 1 statin or aspirin medication. We defined statin medication use as the use of at least 1 statin (3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors) and aspirin use as the use of at least 1 aspirin-containing product (that was not restricted by aspirin indication). We also examined the concurrent use of at least 1 statin and 1 aspirin product.

## Statistical Analysis

All reported values (prevalence and odds ratio [OR]) were weighted to adjust for sampling probability and nonresponse.<sup>9</sup> Descriptive statistics provided age-adjusted estimates (based on the mean age of our analytic sample) for the prevalence of each variable overall and were stratified by Hispanic/Latino background group. Survey-specific procedures were used to compute 95% CIs to account for the 2-stage sampling design, stratification, and clustering. Prevalence of statin and aspirin use was estimated for the sample as a whole and separately within each of the Hispanic/Latino background groups. Comparisons across Hispanic/Latino background groups were performed using the Wald chi-square statistic.

Multivariable logistic regression was used to model differences in the prevalence of statin use among those with high CVD risk. Multivariable multistage logistic regression was adjusted for demographic and clinical factors in model 1; for socioeconomic and acculturation factors in model 2; and additionally for health insurance status in model 3. Our rationale for variable selection was based on factors known to influence the use of medications. ORs with 95% CIs were computed. All statistical tests were 2-sided. No adjustments were made for multiple comparisons. All analyses were performed using SAS version 9.2 (SAS Institute).

## Results

As depicted in Figure 1, 19.5% of eligible individuals (N=14 914) were considered to be at high cardiovascular risk. There were significantly more Puerto Rican adults (26%) at high cardiovascular risk in comparison to the other Hispanic/Latino groups, and this result corresponds to previous findings.<sup>6</sup> The distribution of participants at high cardiovascular risk is included in Figure 1.

## Participants

Table 1 depicts weighted estimates of the demographic and socioeconomic characteristics of Hispanic/Latino participants at high cardiovascular risk. Mean age was 52 years (95% CI 51.4–53.0), and of the 4136 participants included in the sample, 54% were women. Approximately 33% (95% CI

**Table 1.** Sociodemographic Characteristics of Participants at High Cardiovascular Risk Overall and by Hispanic/Latino Background Group (Age-Adjusted)

Characteristic	% (95% CI)								P Value
	All (n=4,136)	Mexican (n=1620)	Cuban (n=558)	Puerto Rican (n=944)	Dominican (n=410)	Central American (n=395)	South American (n=209)		
Age	52.2 (51.4–53.0)	48.5 (47.0–49.9)	58.0 (56.7–59.3)	52.7 (51.0–54.4)	51.2 (49.0–53.4)	52.1 (49.9–54.2)	53.3 (51.0–55.6)		<0.0001
Age group, y									
18 to 57	61.0 (58.5–63.6)	71.9 (67.7–76.0)	42.4 (36.9–47.9)	59.6 (54.9–64.2)	62.3 (55.4–69.3)	63.7 (56.6–70.9)	65.6 (57.2–74.1)		<0.0001
58 to 64	17.2 (15.7–18.6)	14.7 (12.0–17.5)	20.1 (16.6–23.7)	19.4 (16.7–22.2)	18.0 (13.6–22.4)	14.3 (10.3–18.3)	13.6 (9.0–18.2)		<0.0001
>65	21.8 (19.7–23.9)	13.4 (10.5–16.4)	37.5 (32.4–42.6)	21.0 (16.8–25.1)	19.7 (14.1–25.3)	21.9 (14.9–29.0)	20.8 (12.9–28.7)		<0.0001
Women	54.0 (51.7–56.2)	54.7 (50.3–59.2)	48.3 (44.2–52.4)	53.5 (48.9–58.2)	58.6 (53.0–64.2)	56.4 (49.8–62.9)	64.1 (55.4–72.8)		0.0079
Education									
Less than high school	44.1 (41.6–46.5)	53.1 (48.6–57.6)	28.5 (23.9–33.0)	43.9 (40.0–47.8)	48.9 (43.4–54.4)	50.1 (43.5–56.7)	26.5 (19.3–33.6)		<0.0001
High school	22.6 (20.7–24.5)	18.2 (14.6–21.8)	27.4 (22.6–32.3)	25.6 (22.0–29.2)	20.5 (15.1–25.9)	20.7 (15.5–25.9)	27.9 (19.7–36.1)		0.0170
More than high school	33.3 (30.9–35.8)	28.7 (24.6–32.8)	44.1 (38.5–49.7)	30.5 (25.9–35.1)	30.6 (25.7–35.6)	29.2 (23.4–35.1)	45.6 (36.9–54.3)		<0.0001
Household income, \$									
<20 000	50.5 (48.0–53.0)	44.3 (40.0–48.6)	54.5 (49.0–60.0)	53.8 (49.0–58.6)	60.3 (53.5–67.1)	45.5 (38.9–52.1)	49.4 (40.5–58.2)		0.0006
20 000–40 000	26.9 (24.9–28.9)	31.7 (27.9–35.5)	23.3 (18.8–27.7)	22.2 (18.4–26.0)	24.6 (19.7–29.5)	29.8 (23.7–36.0)	30.2 (22.1–38.3)		0.0060
40 000–75 000	10.6 (8.9–12.3)	14.1 (10.7–17.6)	7.7 (4.8–10.5)	10.8 (8.0–13.5)	6.4 (2.8–9.9)	8.5 (5.2–11.9)	8.9 (4.6–13.2)		0.0135
>75 000	3.3 (2.4–4.1)	4.1 (2.3–5.8)	1.6 (0.5–2.8)	5.1 (3.4–6.7)	0.3 (–0.3 to 0.8)	1.3 (–0.2 to 2.8)	7.1 (1.5–12.6)		<0.0001
Missing	8.7 (7.6–9.9)	5.9 (4.3–7.4)	12.9 (9.4–16.5)	8.1 (6.1–10.1)	8.5 (4.7–12.2)	14.9 (10.0–19.8)	4.5 (1.2–7.8)		0.0001
Marital status									
Single	22.8 (21.0–24.6)	12.3 (9.8–14.7)	23.3 (19.2–27.5)	33.5 (29.1–37.9)	34.4 (28.7–40.1)	28.8 (22.4–35.2)	14.8 (8.3–21.2)		<0.0001
Married or living with a partner	51.0 (48.7–53.4)	64.8 (60.9–68.7)	48.1 (43.5–52.7)	38.6 (33.4–43.8)	39.4 (33.6–45.1)	43.4 (37.4–49.4)	55.0 (45.7–64.3)		<0.0001
Separated, divorced, or widowed	26.2 (24.5–27.8)	22.9 (20.0–25.8)	28.5 (24.6–32.4)	27.9 (24.4–31.4)	26.2 (21.0–31.4)	27.8 (22.0–33.5)	30.2 (22.2–38.2)		0.1372
US residence >10 y	80.1 (77.9–82.4)	82.1 (78.9–85.2)	62.0 (56.2–67.9)	94.1 (91.9–96.4)	86.4 (82.2–90.7)	76.6 (71.0–82.2)	76.3 (69.2–83.3)		<0.0001
Nativity									
Foreign born	86.6 (85.0–88.3)	89.5 (87.0–92.0)	92.8 (90.6–94.9)	68.1 (63.5–72.6)	90.3 (85.8–94.9)	97.3 (94.6–100.0)	97.0 (94.0–100.1)		<0.0001
Acculturation (SASH score)	2.0 (1.9–2.0)	1.9 (1.8–1.9)	1.7 (1.6–1.7)	2.6 (2.5–2.6)	1.8 (1.7–1.9)	1.7 (1.6–1.8)	1.9 (1.8–2.0)		<0.0001
Language preference									
Spanish	82.6 (80.6–84.5)	88.6 (85.8–91.3)	91.0 (88.4–93.5)	56.6 (52.0–61.1)	86.5 (81.9–91.1)	92.5 (87.7–97.3)	92.6 (87.8–97.4)		<0.0001

Values were weighted for survey design and nonresponse and were adjusted for age; Hypertension was defined as systolic blood pressure  $\geq 140$  mm Hg, diastolic blood pressure  $\geq 90$  mm Hg, or receiving treatment. Uncontrolled hypercholesterolemia was defined as total cholesterol  $\geq 240$  mg/dL, high-density lipoprotein cholesterol  $< 40$  mg/dL, or low-density lipoprotein cholesterol  $\geq 160$  mg/dL. Obesity was defined as a body mass index  $\geq 30$ , calculated as weight in kilograms divided by height in meters squared. Diabetes mellitus was defined as fasting glucose  $\geq 126$  mg/dL, 2-hour–postload plasma glucose  $\geq 200$  mg/dL, or hemoglobin A1c  $\geq 6.5$ . Smoking was defined as currently smoking cigarettes. An abbreviated 10-question SASH was used (the range of scores was 1–5). SASH indicates Short Acculturation Scale for Hispanics.

30.9–35.8) had more than a high school education, and 51% (95% CI 48.0–53.0) had an annual family income of less than \$20 000. The majority of participants were married or living with a partner (51%), 80% (95% CI 77.9–82.4) had resided in the United States for >10 years, and Spanish was the preferred language (83%). These sociodemographic characteristics varied by Hispanic/Latino group.

Table 2 reports the prevalence of CVD and cardiovascular risk factors and health care characteristics by Hispanic/Latino group. The prevalence of CVD (prevalent CHD or stroke) was 26% overall but ranged from 21% (Mexican background) to 33% (Puerto Rican background). The prevalence of hypertension was 49% (95% CI 46.7–50.6) overall and ranged from 39% (South American background) to 54% (Dominican background). In addition, uncontrolled hypercholesterolemia (untreated or treated, uncontrolled) was 43% overall and varied by Hispanic/Latino background; it was lowest in those with Dominican (34%) and Puerto Rican (39%) backgrounds and highest in those with Central American (50%) and Cuban (48%) backgrounds who were at high cardiovascular risk.

Diabetes was the most prevalent cardiovascular risk factor, affecting 60% (95% CI 58.2–62.5) of participants at high cardiovascular risk. There was a statistically significant ( $P<0.001$ ) difference in diabetes prevalence among Hispanic/Latino background groups, ranging from 51% of participants with a South American background to 68% of participants with a Mexican background who were at high cardiovascular risk. Obesity and smoking were significantly more prevalent among participants with a Puerto Rican background, 60% of whom were obese and 32% of whom were current smokers.

Overall, 81% of participants were using at least 1 medication of any type. More than one-third of participants (37%, 95% CI 34.7–39.5) were not insured, and that result corresponds to national estimates of uninsured rates for the Hispanic/Latino population in the United States. Nevertheless, there were statistically significant differences among Hispanic/Latino groups, ranging from 12% of participants with a Puerto Rican background to 53% of participants with a Central American background who were uninsured. In addition, 32% of participants were publically insured with either Medicare or Medicaid, and 23% had private insurance coverage.

### Differences in the Prevalence of Cardiovascular Medication Use

Table 3 reports the estimated prevalence of statin and aspirin use and their concurrent use among participants at high cardiovascular risk by gender and Hispanic/Latino group. Hispanic/Latino adults at high cardiovascular risk were more

likely to use aspirin (44%) than statins (25%), with 17% concurrently using a statin and aspirin. There were significant differences between Hispanic/Latino groups for both men and women in the use of statins. Specifically, Puerto Rican participants were significantly more likely to use statins (33%) than other Hispanic/Latino groups, with the lowest prevalence in participants with a Central American background (22%).

Among participants at high cardiovascular risk who were aged  $\geq 65$  years, statin use was more prevalent (47%, 95% CI 42.0–51.2) overall than among those aged <65 years, with significant differences among Hispanic/Latino background groups for participants aged <65 years (Table 4). The magnitude of these differences was statistically significant and was similar to those presented in Table 3. Furthermore, there were statistically significant differences among Hispanic/Latino groups among the insured overall. These differences persisted in both age groups for both insured and uninsured participants but, because of limited statistical power, were not statistically significant.

### Factors Associated With Differences in Statin Use

Table 5 displays the results of the bivariate and multivariate analyses examining statin use among Hispanic/Latino participants at high cardiovascular risk. Differences in statin use between Hispanic/Latino background groups at high cardiovascular risk persisted after accounting for differences in age and gender (model 1). Those from Puerto Rican and Dominican backgrounds who were at high cardiovascular risk had significantly higher odds (OR 1.7 [95% CI 1.28–2.22] and OR 1.4 [95% CI 1.01–1.94], respectively) of using statins than those from a Mexican background.

These differences in statin use persisted after controlling for differences in socioeconomic and acculturation variables (model 2) but were no longer statistically significant after accounting for differences in health insurance coverage (model 3). Specifically, differences in insurance coverage substantially reduced the odds of statin use among those with a Puerto Rican background (OR 1.3, 95% CI 0.97–1.75) or a Dominican background (OR 1.07, 95% CI 0.75–1.52) who were at high cardiovascular risk in comparison to their Mexican counterparts. Participants with Cuban, Central American, and South American backgrounds were equally likely to use statins in comparison to those with a Mexican background after accounting for differences in demographic and cardiovascular risk factors.

We also examined the age-adjusted prevalence of statin use for participants of Mexican and Puerto Rican backgrounds by site and found no statistically significant differences. Statin use, for example, among participants with a Mexican background who were at high cardiovascular risk was 24.6% (95%



**Table 2.** Cardiovascular, Medication, and Health Care Characteristics of Participants at High Cardiovascular Risk Overall and by Hispanic/Latino Group (Age-Adjusted)

Characteristic	Participants, % (95% CI)										P Value
	All (n=4136)	Mexican (n=1620)	Cuban (n=558)	Puerto Rican (n=944)	Dominican (n=410)	Central American (n=395)	South American (n=209)				
CVD (prevalent CHD and/or stroke)	25.8 (23.7–27.9)	20.7 (16.8–24.5)	28.3 (24.0–32.7)	33.0 (28.3–37.7)	25.2 (19.9–30.5)	23.2 (17.3–29.2)	26.0 (17.9–34.2)	0.0035			
CVD risk factors											
Hypertension	48.6 (46.7–50.6)	42.2 (38.6–45.9)	53.7 (49.8–57.7)	53.3 (49.2–57.3)	54.2 (47.1–61.4)	48.5 (43.3–53.8)	38.5 (30.3–46.8)	<0.0001			
Uncontrolled hypercholesterolemia	43.0 (40.8–45.2)	44.1 (40.3–47.9)	47.5 (41.8–53.2)	39.0 (34.8–43.2)	33.5 (27.3–39.6)	49.8 (42.7–57.0)	44.4 (35.3–53.4)	0.0015			
Obese	54.0 (51.7–56.3)	55.4 (51.2–59.5)	51.7 (46.7–56.7)	59.9 (55.2–64.6)	50.0 (42.9–57.1)	48.9 (42.0–55.8)	44.1 (35.5–52.7)	0.0058			
Diabetes	60.4 (58.2–62.5)	67.8 (64.2–71.4)	57.0 (51.9–62.0)	55.2 (50.7–59.7)	54.6 (49.1–60.0)	63.7 (57.2–70.1)	50.7 (42.6–58.8)	<0.0001			
Smoking	21.1 (19.1–23.2)	15.6 (12.1–19.1)	28.4 (23.5–33.2)	32.2 (27.8–36.6)	10.9 (6.7–15.0)	11.2 (7.4–15.1)	18.5 (11.5–25.4)	<0.0001			
≥2 CVD risk factors	64.1 (61.8–66.4)	63.4 (59.2–67.5)	67.0 (62.3–71.8)	68.9 (64.5–73.4)	59.1 (52.3–65.9)	59.8 (54.2–65.4)	50.3 (41.8–58.7)	0.001			
Number of medications											
Mean	4.6 (4.4–4.7)	4.4 (4.2–4.7)	4.6 (4.2–5.0)	5.3 (4.9–5.6)	4.4 (3.9–4.8)	4.0 (3.6–4.4)	3.7 (3.2–4.3)	<0.0001			
0	19.0 (17.1–21.0)	18.3 (14.6–21.9)	18.8 (15.5–22.1)	17.5 (13.4–21.6)	22.9 (17.5–28.4)	20.5 (15.5–25.6)	21.4 (14.0–28.8)	0.6546			
1	9.8 (8.5–11.1)	10.4 (7.9–12.9)	9.0 (6.4–11.6)	9.2 (6.1–12.3)	7.6 (4.4–10.7)	11.5 (8.0–15.0)	14.6 (9.0–20.3)	0.2784			
2–3	19.2 (17.5–20.8)	20.4 (17.3–23.6)	21.9 (18.3–25.6)	13.3 (10.7–15.8)	18.6 (13.8–23.4)	22.8 (17.7–27.8)	19.6 (12.6–26.6)	0.0002			
≥4	52.0 (50.1–54.0)	50.8 (47.1–54.6)	50.3 (46.5–54.1)	60.0 (56.1–63.9)	50.9 (45.7–56.1)	45.2 (39.8–50.6)	44.4 (37.1–51.7)	0.0002			
Health insurance											
None	37.1 (34.7–39.5)	49.2 (45.2–53.3)	46.3 (42.0–50.6)	11.6 (8.6–14.7)	16.6 (11.7–21.5)	53.4 (46.7–60.2)	42.5 (34.3–50.8)	<0.0001			
Private	22.9 (20.9–24.9)	20.8 (17.8–23.8)	11.6 (8.1–15.1)	37.2 (32.9–41.5)	30.1 (24.6–35.7)	12.9 (8.9–16.9)	24.7 (16.4–32.9)	<0.0001			
Public (Medicare or Medicaid)	32.0 (29.8–34.2)	18.7 (15.6–21.8)	37.6 (32.8–42.3)	44.9 (39.6–50.2)	47.5 (41.6–53.4)	25.2 (19.0–31.3)	21.6 (13.8–29.3)	<0.0001			
Other	6.1 (4.7–7.5)	10.7 (7.4–14.0)	3.3 (1.4–5.2)	3.3 (1.7–4.8)	1.8 (0.2–3.4)	6.0 (3.2–8.7)	8.0 (3.7–12.4)	<0.0001			
Missing	1.8 (1.1–2.5)	0.6 (–0.1 to 1.3)	1.2 (0.2–2.2)	3.0 (1.3–4.7)	4.0 (0.5–7.5)	2.5 (–2.0 to 7.1)	3.2 (–0.1 to 6.5)	0.0531			

Values were weighted for survey design and nonresponse and adjusted for age. Hypertension was defined as systolic blood pressure ≥140 mm Hg, diastolic blood pressure ≥90 mm Hg, or receiving treatment. Uncontrolled hypercholesterolemia was defined as total cholesterol ≥240 mg/dL, high-density lipoprotein cholesterol <40 mg/dL, or low-density lipoprotein cholesterol ≥160 mg/dL. Obesity was defined as a body mass index ≥30, calculated as weight in kilograms divided by height in meters squared. Diabetes mellitus was defined as fasting glucose ≥126 mg/dL, 2-hour-postload plasma glucose ≥200 mg/dL, hemoglobin A1c ≥6.5. Smoking was defined as currently smoking cigarettes. An abbreviated 10-question Short Acculturation Scale for Hispanics was used (the range of scores was 1–5). CHD indicates coronary heart disease; CVD, cardiovascular disease.

**Table 3.** Prevalence of Cardiovascular Medication Use Among Participants at High Cardiovascular Risk Overall and by Hispanic/Latino Group (Age-Adjusted)

	Participants, % (95% CI)						
	All (n=4136)	Mexican (n=1620)	Cuban (n=558)	Puerto Rican (n=944)	Dominican (n=410)	Central American (n=395)	South American (n=209)
<b>Statin use</b>							
Overall <sup>§</sup>	25.4 (23.8–27.1)	23.5 (20.4–26.6)	22.2 (18.2–26.2)	32.9 (29.7–36.2)	28.3 (24.2–32.4)	20.0 (14.7–25.2)	22.4 (15.7–29.1)
Men <sup>†</sup>	25.9 (23.0–28.8)	24.3 (19.0–29.5)	21.9 (15.9–27.8)	32.2 (26.6–37.8)	31.8 (24.1–39.4)	17.9 (10.5–25.2)	32.0 (19.6–44.4)
Women <sup>‡</sup>	24.9 (22.7–27.2)	22.8 (18.8–26.7)	22.5 (16.1–29.0)	33.5 (28.6–38.3)	25.8 (20.2–31.4)	21.6 (14.4–28.8)	17.1 (9.9–24.3)
<b>Aspirin use</b>							
Overall	44.0 (41.9–46.2)	42.7 (38.9–46.4)	42.0 (37.3–46.6)	47.2 (43.1–51.3)	48.0 (41.7–54.3)	42.0 (35.7–48.3)	42.9 (34.5–51.3)
Men	44.7 (41.4–47.9)	42.9 (37.1–48.7)	43.4 (36.6–50.2)	45.1 (37.9–52.2)	53.8 (45.5–62.1)	42.2 (31.5–52.9)	48.3 (34.3–62.4)
Women	43.6 (40.8–46.4)	42.7 (37.5–47.9)	40.5 (34.5–46.6)	49.3 (44.0–54.5)	43.9 (36.1–51.7)	41.9 (33.9–49.9)	40.0 (29.8–50.2)
<b>Concurrent aspirin and statin use</b>							
Overall <sup>§</sup>	17.4 (15.9–18.9)	16.3 (13.8–18.8)	13.1 (9.5–16.8)	22.8 (19.8–25.7)	19.7 (15.9–23.6)	16.1 (10.9–21.2)	17.0 (11.0–23.0)
Men	18.1 (15.5–20.7)	17.0 (12.5–21.5)	14.1 (8.7–19.5)	20.5 (16.2–24.7)	25.7 (18.3–33.0)	16.3 (9.0–23.5)	26.3 (13.9–38.7)
Women <sup>‡</sup>	16.7 (14.9–18.6)	15.7 (12.6–18.9)	12.2 (7.0–17.4)	24.8 (20.1–29.6)	15.5 (10.9–20.2)	16.0 (8.7–23.2)	11.9 (6.1–17.6)

Values were weighted for survey design and nonresponse and adjusted for age.

<sup>†</sup>P<0.05.

<sup>‡</sup>P<0.01.

<sup>§</sup>P<0.001.

CI 21.1–28.0) in Chicago and 23.0% (95% CI 18.6–27.5) in San Diego.

### Differences in the Prevalence of Statin and Aspirin Use Among Adults at High Cardiovascular Risk With and Without Prevalent CVD

Figure 2 displays the prevalence of statin and aspirin use and their concurrent use among participants at high cardiovascular risk with (n=939) and without (n=3197) prevalent CVD. Overall, 33% of participants with prevalent CVD were using statin medications and 51% were using aspirin. Although there were notable differences in statin use and aspirin use across Hispanic/Latino background groups, these differences were not statistically significant.

Overall, 23% of participants at high cardiovascular risk without prevalent CVD were using a statin, and 42% were using aspirin. There was a statistically significant difference in the prevalence of statin use by Hispanic/Latino background group (P<0.001). Those with a Central American background were the least likely to use statins (17%), and those with a Puerto Rican background who were without CVD but at high cardiovascular risk were the most likely to report the use of statins (32%). These differences persisted in both men and women (data not shown). We found no significant difference in the prevalence of aspirin use by Hispanic/Latino background groups among participants without prevalent CVD.

### Discussion

To our knowledge, this study is the first to document variations in the use of statins and aspirin among the diverse Hispanic/Latino population in the United States. We found that among Hispanic/Latino adults at high risk of CVD, 25% used statins and less than half (44%) used aspirin. Despite evidence that demonstrates clinical benefits for the primary and secondary prevention of CVD, our findings indicated substantial underuse of statins, particularly for the primary prevention of CVD, among the growing Hispanic/Latino population in the United States.

We also found that adults with Puerto Rican and Dominican backgrounds who were at high cardiovascular risk were significantly more likely than other Hispanic/Latino background groups, including those with a Mexican background, to use these cardiovascular medications. These disparities were not related to differences in cardiovascular risk profiles or socioeconomic or acculturation factors, including language preference, but rather were associated with differences in health insurance. These findings suggest that certain Hispanic/Latino background groups may encounter more barriers than others in accessing prescription medications. Recent efforts through the Patient Care and Affordable Care Act to expand insurance coverage<sup>11</sup> may contribute to improvements in the use of statins and ultimately lead to prevention of CVD within the growing Hispanic/Latino population in the United States.

**Table 4.** Prevalence of Statin Use Among Participants at High Cardiovascular Risk by Hispanic/Latino Group According to Age Group and Insured Status

	Participants, % (95% CI)						
	All (n=4136)	Mexican (n=1620)	Cuban (n=558)	Puerto Rican (n=944)	Dominican (n=410)	Central American (n=395)	South American (n=209)
Aged ≥65 y	46.6 (42.0–51.2)	39.0 (29.5–48.5)	48.7 (39.8–57.5)	52.4 (44.5–60.3)	51.4 (37.3–65.4)	41.7 (22.8–60.7)	35.6 (17.7–53.6)
Aged <65 y <sup>§</sup>	19.5 (17.8–21.3)	16.5 (13.3–19.6)	16.3 (12.4–20.3)	28.5 (24.3–32.6)	21.3 (17.0–25.6)	13.7 (9.3–18.2)	20.5 (13.5–27.6)
<b>Insured</b>							
Overall <sup>§</sup>	34.0 (31.5–36.5)	28.0 (23.1–32.9)	43.5 (37.0–49.9)	36.0 (31.7–40.3)	31.8 (25.7–37.8)	28.3 (19.9–36.8)	26.5 (16.3–36.7)
Aged ≥65 y	51.5 (46.4–56.6)	47.0 (35.5–58.4)	53.6 (44.3–63.0)	53.1 (44.6–61.7)	54.9 (39.1–70.6)	46.0 (25.4–66.6)	39.2 (18.3–60.1)
Aged <65 y	26.5 (24.0–29.0)	22.7 (17.9–27.6)	30.3 (22.1–38.6)	30.8 (26.2–35.4)	24.8 (19.5–30.0)	21.5 (13.2–29.8)	21.5 (10.1–32.8)
<b>Uninsured</b>							
Overall	11.4 (9.1–13.8)	11.9 (8.2–15.7)	8.5 (3.8–13.2)	14.7 (7.2–22.2)	12.3 (3.8–20.8)	9.5 (4.4–14.6)	20.8 (11.7–29.9)
Aged ≥65 y	16.9 (4.8–29.0)	14.6 (0.0–30.3)	20.6 (0.0–48.4)	0	6.9 (0.0–21.5)	16.1 (0.0–40.3)	24.9 (0.0–50.4)
Aged <65 y	11.0 (8.7–13.2)	11.8 (7.9–15.6)	6.9 (3.2–10.7)	15.2 (7.5–22.9)	12.8 (3.7–21.8)	8.5 (4.1–12.8)	20.2 (10.8–29.6)

Values were weighted for survey design and nonresponse and adjusted for age.

<sup>§</sup>P<0.001.

Our findings from the HCHS/SOL suggest that prior research that primarily classified Hispanic/Latino participants as a single group may underestimate disparities in the use of preventative cardiovascular medications within the diverse Hispanics/Latino population currently living in the United States.<sup>7,8</sup> In contrast to a previous study<sup>7</sup> indicating that ≈46% of Hispanics/Latino and 38% of black participants at high cardiovascular risk use statins compared with 50% of the non-Hispanic white population, our findings demonstrated variations in statin use within the diverse US Hispanic/Latino population at high cardiovascular risk, particularly for the primary prevention of CVD, for which statin medications are indicated.

Although prior analyses reported racial and ethnic disparities in the use of aspirin,<sup>7</sup> we found no such differences within the Hispanic/Latino population at high cardiovascular risk. This was true for aspirin use for both primary and secondary prevention of CVD. In fact, more than half (51%) of Hispanic/Latino participants with prevalent CVD were using aspirin—a medication that can be obtained without a prescription at a fraction of the cost—whereas only 33% were using a statin (which is available only by prescription). These findings suggest that addressing cost and access barriers to the use of prescription medications (versus nonprescription) is particularly important for the US Hispanic/Latino population.

We also evaluated differences in statin use by Hispanic/Latino background that suggest, in contrast to our finding on aspirin use, variation in the use of statins among adults at high cardiovascular risk within the Hispanic/Latino population. These differences were particularly pronounced among those without prevalent CVD. Of note, 32% of

participants with a Puerto Rican background versus 17% and 21% of those with Central American and Mexican backgrounds, respectively, at high cardiovascular risk used statins for the primary prevention of CVD. Participants with Central American and Mexican backgrounds who were at high cardiovascular risk were more likely to have uncontrolled (untreated or treated) hypercholesterolemia (50%) and diabetes (68%), respectively, both of which are leading risk factors for CVD. Improving access to and use of statins among the Hispanic/Latino population, particularly background-specific groups most at risk for underuse, is critical for efforts aimed at reducing the burden of CVD and should be a public health priority. These efforts are particularly important considering recent American College of Cardiology and American Heart Association guidelines<sup>2</sup> that recommend treatment with statins for both primary and secondary prevention of CVD.

Our study suggests that policies and interventions to reduce disparities in the use of preventive cardiovascular medications within the diverse Hispanic/Latino population must address barriers to accessing health insurance. Although recent implementation of the Affordable Care Act, which sought to improve health insurance coverage, is promising<sup>11</sup>—with evidence that uninsured rates among Hispanic/Latino adults declined to 23% in 2014 compared with 36% in 2013<sup>12</sup>—there is significant variation at the state level. Of note, >33% of Latino/Hispanic adults living in states that have not expanded Medicaid (eg, Texas) remain uninsured compared with an uninsured rate of 17% among those living in states (eg, Illinois) that have implemented Medicaid expansion.<sup>12</sup> Consequently, Medicaid expansion may contribute to improvements in insurance coverage and thus statin

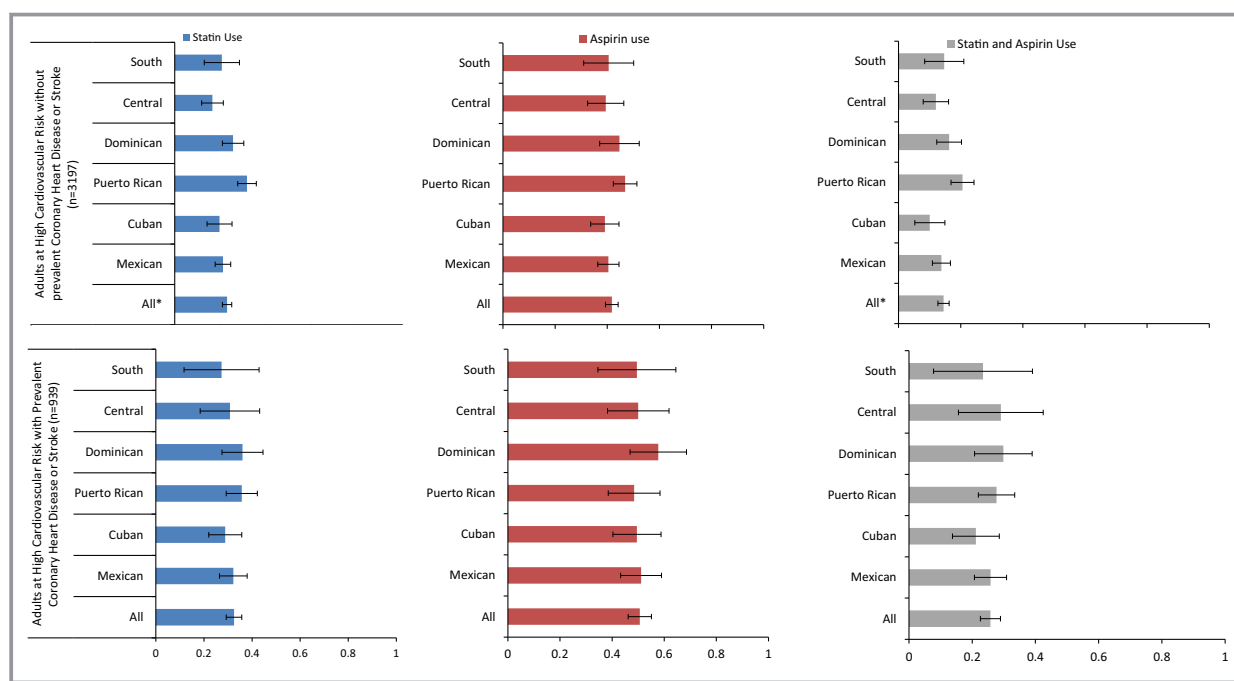


**Table 5.** Sociodemographic, Acculturation, and Health Care Factors Associated With Differences in Statin Use Among the Hispanic/Latino Population at High Cardiovascular Risk

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)		
		Model 1	Model 2	Model 3
<b>Hispanic/Latino group</b>				
Mexican	Reference	Reference	Reference	Reference
Cuban	1.64 (1.23–2.19)*	0.99 (0.73–1.34)	1.21 (0.89–1.66)	1.07 (0.77–1.49)
Puerto Rican	2.08 (1.60–2.71)*	1.69 (1.28–2.22)*	1.73 (1.30–2.31)*	1.30 (0.97–1.75)
Dominican	1.54 (1.12–2.13)*	1.40 (1.01–1.94)*	1.45 (1.04–2.02)*	1.07 (0.75–1.52)
Central	1.03 (0.67–1.58)	0.86 (0.57–1.29)	0.94 (0.63–1.40)	0.97 (0.64–1.46)
South American	1.28 (0.83–1.96)	1.18 (0.73–1.92)	1.19 (0.74–1.93)	1.13 (0.69–1.84)
<b>Age, y</b>				
<57	Reference	Reference	Reference	Reference
57–64	2.72 (2.13–3.46)*	2.47 (1.92–3.18)*	2.33 (1.80–3.02)*	2.25 (1.72–2.94)*
≥65	4.72 (3.71–6.01)*	4.52 (3.54–5.77)*	4.24 (3.29–5.47)*	3.12 (2.38–4.10)*
<b>Gender</b>				
Women	Reference	Reference	Reference	Reference
Men	0.98 (0.79–1.23)	0.96 (0.76–1.22)	0.90 (0.71–1.13)	0.91 (0.71–1.16)
<b>Number of CVD risk factors</b>				
0 or 1	Reference	Reference	Reference	Reference
≥2	2.22 (1.77–2.79)*	2.05 (1.63–2.59)*	1.99 (1.58–2.51)*	2.08 (1.64–2.63)*
<b>Prevalent CVD (CHD or stroke)</b>				
No	Reference	Reference	Reference	Reference
Yes	1.58 (1.27–1.98)*	1.56 (1.18, 1.82)*	1.62 (1.26–2.07)*	1.50 (1.16–1.95)*
<b>Education</b>				
Less than high school	Reference		Reference	Reference
High school	0.57 (0.45–0.73)		0.71 (0.54–0.91)	0.72 (0.55–0.93)
More than high school	0.78 (0.61–0.99)		0.94 (0.71–1.23)	0.94 (0.71–1.23)
<b>Household income, \$/year</b>				
<20 000	Reference		Reference	Reference
20 000–40 000	0.68 (0.54–0.86)*		0.82 (0.64–1.05)	0.89 (0.69–1.15)
40 000–75 000	0.83 (0.56–1.23)		1.08 (0.74–1.58)	1.07 (0.72–1.57)
>75 000	1.32 (0.71–2.43)		2.07 (0.99–4.32)	1.94 (0.82–4.58)
<b>Language preference</b>				
English	Reference		Reference	Reference
Spanish	1.21 (0.94–1.56)		1.24 (0.91–1.69)	1.36 (0.99–1.87)
<b>Years in the United States</b>				
<5	Reference		Reference	Reference
5–10	1.99 (1.18–3.35)*		2.32 (1.35–4.00)*	2.10 (1.27–3.47)*
≥10	3.55 (2.41–5.21)*		3.16 (2.06–4.86)*	2.34 (1.58–3.47)*
<b>Health insurance</b>				
No	Reference			Reference
Private	3.49 (2.60–4.68)*			2.53 (1.81–3.53)*
Public (Medicaid or Medicare)	4.84 (3.65–6.43)*			2.86 (2.10–3.89)*
Other	2.10 (1.32–3.33)*			1.74 (1.06–2.87)*
Missing	2.39 (0.87–6.54)			1.69 (0.69–4.14)

Model 1: adjusted for Hispanic/Latino group, age, gender, CVD status. Model 2: adjusted for all variables in model 1 plus education, income, language, Short Acculturation Scale for Hispanics score, and number of years in the United States. Model 3: adjusted for all variables in model 2 and health insurance. Values were weighted for survey design and nonresponse. CHD indicates coronary heart disease, CVD, cardiovascular disease; OR, odds ratio.

\*P<0.05.



**Figure 2.** Prevalence estimates of cardiovascular medication use among adults at high cardiovascular risk with and without prevalent cardiovascular disease by Hispanic/Latino group (age adjusted). \*Statistically significant difference ( $P<0.05$ ) in prevalence of use across Hispanic/Latino groups. Values were weighted for survey design and nonresponse and were adjusted for age. Error bars indicate 95% CI.

use for some Hispanic/Latino groups but not others based on state of residence. Future research should examine the impact of the Affordable Care Act on disparities in access to prescription medications, including statins, within the Hispanic/Latino population.

### Limitations

Our analysis has several limitations. First, our definition of high cardiovascular risk, including prevalent CVD, includes self-reported information and lacks some variables used by others when assigning cardiovascular risk (eg, Framingham risk score). Second, although other prescription medications may be used for the prevention of CVD, we focused on statins and aspirin because they are first-line recommendations with proven benefit for CVD and are currently used almost exclusively for this purpose. Third, our measure of aspirin use does not differentiate between aspirin used regularly for CVD prevention and aspirin used for symptomatic treatment as an analgesic. Fourth, the HCHS/SOL did not include any other US racial or ethnic groups for comparison; however, the findings for statin and aspirin use of the Hispanic/Latino population in aggregate are similar to those found in other national surveys.<sup>7</sup> Finally, our analyses excluded 1501 participants with missing information. Compared with the 14 914 participants included in our analysis, these participants were less likely to be uninsured (40% versus 49%;

$P<0.001$ ) and were slightly younger (mean age 38 years versus 41 years;  $P<0.001$ ).

### Conclusions

Among Hispanic/Latino adults of diverse backgrounds, statin use—especially for the primary prevention of CVD—was more prevalent in those with Puerto Rican and Dominican backgrounds who were at high cardiovascular risk. Statin use was associated with insurance coverage and may contribute to future cardiovascular outcomes within the growing US Hispanic/Latino population that is experiencing a growing burden of CVD and CVD risk factors. Efforts to increase the use of statins among Hispanic/Latino adults at high cardiovascular risk, particularly targeting at-risk groups such as those with Mexican and Central American backgrounds, should include improving access to health insurance coverage. Efforts to improve prescription of, access to, and use of statins are particularly important.

### Sources of Funding

The Hispanic Community Health Study/Study of Latinos was carried out as a collaborative study supported by contracts from the National Heart, Lung, and Blood Institute (NHLBI) to the University of North Carolina (N01-HC65233), University of

Miami (N01-HC65234), Albert Einstein College of Medicine (N01-HC65235), Northwestern University (N01-HC65236) University of Illinois at Chicago (HHSN268201300003I), and San Diego State University (N01-HC65237). The following Institutes/Centers/Offices contribute to the HCHS/SOL through a transfer of funds to the NHLBI: National Institute on Minority Health and Health Disparities, National Institute on Deafness and Other Communication Disorders, National Institute of Dental and Craniofacial Research, National Institute of Diabetes and Digestive and Kidney Diseases, National Institute of Neurological Disorders and Stroke, NIH Institution-Office of Dietary Supplements.

## Disclosures

None.

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