



# A New Era in Understanding Diabetes Disparities Among U.S. Latinos—All Are Not Equal

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Latinos currently comprise 15% of the U.S. population. It is estimated that by 2050, 1 out of 3 U.S. residents will be Latino (1). The Latino population is a heterogeneous mix of people born in and outside the U.S., with different social, cultural, and behavioral attitudes that may affect health. The prevalence of diabetes in adults over the age of 20 years is higher among Latinos compared with non-Hispanic whites (2). However, the differences in diabetes and obesity prevalence among Latino subgroups are masked when all individuals are combined into a single group. Specifically, the higher overall diabetes prevalence is driven by Puerto Rican and Mexican Americans, while Cuban, Central, and South Americans have similar prevalence to non-Hispanic whites (2,3). The Endocrine Society's Scientific Statement on Health Disparities in Endocrine Disorders identified that "a major gap in our current understanding of race/ethnic disparities in endocrine disorders is a failure of most studies to specify Hispanic-American and Asian-American subgroups" and recommended that "future studies accurately identify ethnic subgroups" (2). The Hispanic Community Health Study/Study of Latinos (HCHS/SOL) is the first U.S. population-based study to address this knowledge gap with 16,415

Latino women and men (3,4). Prior to the creation of this cohort, the Centers for Disease Control and Prevention was unable to estimate the total prevalence of diabetes among Latinos (5). In this issue, two articles published from the HCHS/SOL fill in this void in diabetes epidemiology (5,6).

Both articles demonstrate high prevalence of diabetes and the metabolic syndrome among Latinos, and their major strength is highlighting the heterogeneity in prevalence among U.S. Latinos of diverse origins. Schneiderman et al. (5) report differential diabetes prevalence rates among Latinos with 10.2% in South Americans and 13.4% in Cubans to 17.7% in Central Americans, 18.0% in Dominicans and Puerto Ricans, and 18.3% in Mexicans. Of note, diabetes prevalence related positively with years living in the U.S., but was negatively related to education and household income. Heiss et al. (6) found that the rate of the metabolic syndrome was high in Latinos but that it varied by age, sex, and Hispanic/Latino background. Among women, the prevalence ranged from 27% in South Americans to 41% in Puerto Ricans. Among men, prevalence ranged from 27% in South Americans to 35% in Cubans.

Interestingly, the prevalence of diabetes was positively correlated with increasing years of living in the U.S., an important proxy measure of acculturation—the process whereby an immigrant culture adopts the beliefs and practices of a host culture (7,8). Generally, the acculturation process has been demonstrated to exert a deleterious effect on Latino health and is hypothesized to occur in a cumulative fashion with accumulation of risk factors over the lifecourse. Prior studies have demonstrated that higher levels of acculturation among Latinos are associated with a higher prevalence of cardiovascular disease (CVD) risk factors and important mediating factors such as poor nutrition, low rates of physical activity, and subsequent obesity (9–12). Schneiderman et al. (5) confirm that any immigrant health advantage may be dissipated over time. Although low socioeconomic levels in Latinos have been associated in some studies with lower CVD and overall mortality (13–15), there is no mortality advantage among those Latinos who have increased CVD risk factor burden (16–18). However, the effects of acculturation are complex as greater acculturation may bring positive effects through increased insurance coverage with greater access to health care and use of preventive health services,

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See accompanying articles, pp. 2233 and 2391.

improved socioeconomic status, and increased English language ability, allowing for higher social capital (7). This is in accordance with the negative association between diabetes prevalence and education/income in the Schneiderman et al. (5) study. Thus, the effects of acculturation are moderated not only by country of origin but also by sex, socioeconomic status, nativity status, age of migration, and geographic location in the U.S. (7).

Strikingly, Heiss et al. (6) found that 96% of Latino women with metabolic syndrome had abdominal obesity and that the median waist circumference (WC) was larger with an increasing number of metabolic syndrome risk factors, indicating that abdominal obesity is the primary contributor to the syndrome in Latino women. Visceral fat is an important determinant of type 2 diabetes risk and current WC cut points may underestimate disease risk in Asian populations (who have greater visceral fat at a given BMI compared with whites) and overestimate risk in black women (who have greater subcutaneous fat at a given WC compared with white women) (2). A weakness in the study by Heiss et al. (6) is that it lacked data on abdominal fat distribution, so it remains unclear how visceral fat is related to WC in these Latino subpopulations and whether abdominal fat distribution differs from that of whites. While some studies have attempted to establish appropriate WC cutoffs for Latino women based on prevalent metabolic risk factors and diabetes, future studies are needed to describe abdominal fat distribution at various WC cut points and determine which thresholds predict incident diabetes, a major gap in our current knowledge (19). A major weakness of both studies (5,6) is their cross-sectional design, limiting our understanding of the long-term implications of these ethnic differences on CVD and diabetes risk, complications, and mortality. Prospective follow-up and re-examination of this cohort will shed light on these important questions.

In order to turn the tide on the epidemic of high prevalence of cardio-metabolic risk factors among Latinos, we will need to integrate health system, provider, and patient factors (20). Lack of access, financial and language barriers, poor health literacy and

numeracy, and distrust of and perceived discrimination by health care providers can contribute to poor diabetes quality of care and health outcomes among socially disadvantaged and minority patients (2). Striking findings by these studies (5,6) were the low rates of diabetes awareness and control and health insurance coverage across a diversity of Latino backgrounds, highlighting the contribution of health system factors and access to disparities in this population. Rate of diabetes awareness was 58.7%, adequate glycemic control (A1C <7%, 53 mmol/mol) was 48.0%, and health insurance coverage among those with diabetes was 52.4%. Various aspects of the structure of health care systems can contribute to poor outcomes for Latinos with diabetes. Low-income patients may be more sensitive to the impact of required copayments (2). A prior study showed that Latinos did not perform self-monitoring of blood glucose, which is recommended for insulin-treated patients, because of financial concerns (21).

Inadequate access to care and lack of health insurance are important contributors to health care disparities and poor quality of care. Uninsured adults with diabetes receive fewer recommended processes of care, have poorer glycemic control, and develop more diabetes complications (2). Specifically among Latinos with diabetes, those lacking health insurance have higher rates of microvascular complications (22). The positive effects of insurance coverage on health outcomes for adults with a wide range of acute and chronic conditions include greater use of health services, improved self-reported health outcomes, better disease control, and increased survival (23,24). Through expansion of health insurance access, the Affordable Care Act has the potential to eliminate health disparities especially among Latinos who have the highest rates of uninsurance in the U.S. (25). With the implementation of the Affordable Care Act and better data from studies like HCHS/SOL, we stand poised to identify the subpopulations at greatest disease risk and eliminate health care disparities among Latinos through targeted patient and health system interventions. The HCHS/SOL study provides an important model for how to decompose the heterogeneous burden of chronic diseases among

other racial/ethnic groups (e.g., African/African Americans and Asian/Asian Americans). Future studies will be needed to further explore the complex social determinants of health faced by racial/ethnic minorities.

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