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Addressing Challenges and Implications of National Surveillance for Racial/Ethnic Disparities in Diabetes

Kunihiro Matsushita, MD, PhD, Olive Tang, AB, Elizabeth Selvin, PhD, MPH

Welch Center for Prevention, Epidemiology, and Clinical Research, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland.

Diabetes mellitus is an epidemic in the United States that disproportionately affects racial/ethnic minorities, with higher prevalence in black, Hispanic, and Asian populations than in the white population.¹ Racial/ethnic minorities with diabetes also have worse outcomes, including higher risks of amputations, end-stage kidney disease, and death.²

In this issue of *JAMA*, Cheng and colleagues³ used 2011–2016 data from the National Health and Nutrition Examination Survey (NHANES) to estimate the race/ethnicity-specific prevalence of diabetes in the United States. In this analysis of cross-sectional survey data and samples from 7575 adults (mean age, 47.5 years; 52% women), there was a higher prevalence of diagnosed diabetes in black (13.6%), Hispanic (10.9%), and Asian (9.9%) groups compared with the white group (9.1%), consistent with prior work.⁴ The most novel and important aspects of this study are the nationally representative estimates of both diagnosed and undiagnosed diabetes as well as prediabetes within Hispanic and Asian subgroups. The authors report an almost 2-fold difference in age- and sex-adjusted prevalence of total diabetes within Hispanic and Asian subgroups. The prevalence of undiagnosed diabetes was observed to differ among Hispanic subgroups but not Asian subgroups, although the numbers of individuals in specific ethnic subgroups in these analyses were small. No evident differences in the prevalence of prediabetes were seen within Hispanic or Asian subgroups.

The proportion of total diabetes that is undiagnosed is a critical public health metric that can be used to identify gaps in screening. However, the estimates for undiagnosed diabetes reported by Cheng et al³—ranging from one-fourth to one-third of total diabetes cases—should be interpreted cautiously. In clinical practice, the diagnosis of diabetes requires confirmatory testing, either with the same or a different test on a different day or a different test in the same blood sample.⁵ The authors used a definition of undiagnosed diabetes based on a single positive result from any 1 of 3 screening tests (fasting plasma glucose level ≥ 126 mg/dL, glycated hemoglobin [HbA_{1c}] level $\geq 6.5\%$, or 2-hour plasma glucose level ≥ 200 mg/dL after a 75 g oral challenge, also known as an oral glucose tolerance test [OGTT]).

Corresponding Author: Kunihiro Matsushita, MD, PhD, Welch Center for Prevention, Epidemiology, and Clinical Research, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, 2024 E Monument St, Ste 2-600, Baltimore, MD 21287 (kuni.matsushita@jhu.edu).

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This approach likely overestimates the true prevalence of undiagnosed diabetes in the population.^{6,7} In the study by Cheng et al,³ more cases of undiagnosed diabetes were detected based on OGTT compared with either of the other tests, and the magnitude of this difference varied by race and ethnicity. Among those without diagnosed diabetes, black groups had the highest HbA_{1c} level, Hispanic groups had the highest fasting plasma glucose level, and Asian groups had the highest 2-hour plasma glucose level. Whether these differences reflect variations in underlying biology or in test performance by race and ethnicity is not known.

The high prevalence of prediabetes documented by Cheng et al³ (approximately 30%–40%) is concerning but also requires context. Several definitions of prediabetes are currently in clinical use, and depending on the definition used, prevalence estimates for prediabetes identified using a single test can differ by up to 4-fold.⁸ Cheng et al³ used the American Diabetes Association definition of prediabetes based on an HbA_{1c} level of 5.7% to less than 6.5%, fasting plasma glucose level of 100 mg/dL to less than 126 mg/dL, or 2-hour plasma glucose level of 140 mg/dL to less than 200 mg/dL,⁵ although repeat confirmation was not performed. Because of the inconvenience of OGTT testing, the majority of screening for prediabetes is currently performed using an HbA_{1c} level, fasting plasma glucose level, or both. Many individuals who met the definition of prediabetes in this study would not be classified as having prediabetes in practice. However, the major trials of prevention of diabetes were performed in individuals with impaired glucose tolerance based on OGTT, with or without impaired fasting glucose.^{9,10} Accurate population estimates of the prevalence of prediabetes have far-reaching implications for informing prevention efforts and resource allocation, for example, eligibility for the Medicare Diabetes Prevention Program.¹¹

Cheng et al³ also estimated a higher age- and sex-adjusted prevalence of total diabetes in US Asian groups compared with the white group. This contrast in prevalence was larger after accounting for body mass index (BMI): eg, 27.0% in Asian groups vs 11.9% in the white group. At a given BMI, some Asian populations, compared with the white population, have greater visceral adiposity and increased insulin resistance.¹² Current guidelines recommend screening for diabetes in middle-aged adults with BMI of 25 or greater, but this cut point may not be sufficiently sensitive in Asian populations.^{12,13} A 2015 position statement from the American Diabetes Association recommended lowering the BMI cut point for diabetes screening in Asian populations to 23,^{2,14} but this recommendation is not widely implemented.¹⁵ The higher prevalence of diabetes in Asian groups reported by Cheng et al³ supports adoption of lower BMI thresholds for diabetes screening in Asian populations. Use of lower BMI thresholds for screening in Asian populations may help identify additional cases of undiagnosed diabetes in clinical practice.

To improve national surveillance and inform targeted screening requires using definitions of diabetes and prediabetes that are consistent with how medicine is practiced. Except for use during pregnancy, the OGTT is rarely used for screening given its high patient burden. Fasting plasma glucose and HbA_{1c} levels are readily obtained, reliable, and strongly linked to outcomes. Defining undiagnosed diabetes using a single positive test from these 3 measurements will overestimate diabetes prevalence in the population. Current clinical

definitions of diabetes rely on confirmatory testing to reduce false-positive results. Prevalence studies need to adopt this approach to most accurately characterize the true rates of undiagnosed diabetes in the US population and understand disparities by race/ethnicity.

Incorporating race/ethnicity into clinical decision-making or policy making is challenging and can be problematic. Race/ethnicity is usually based on self-report and is often not well documented in health records.¹⁶ Race/ethnicity can be a poor proxy for underlying differences in genetic susceptibility, socioeconomic status (including health literacy and health care access), lifestyle (eg, diet and physical activity), neighborhood, and environment. A significant limitation of NHANES and other surveys is a lack of data on individuals with multiple races/ethnicities (eg, white-Asian), who represent rapidly growing populations in the United States.¹⁷ Ultimately, understanding the underlying social and biological mechanisms driving racial/ethnic disparities in diabetes is necessary to best inform approaches to screening and tailor prevention and intervention strategies.

National surveillance of prevalence and trends in diabetes is critical for allocation of public health resources and for planning and evaluation of screening, prevention, and treatment strategies. The study by Cheng et al³ raises 4 critical issues for the field. First, the definitions of diabetes and prediabetes should be consistent with clinical recommendations. Second, the prevalence of diabetes differs considerably within Hispanic and Asian subpopulations. Third, clinicians should consider diabetes screening at lower BMI thresholds in Asian populations. Fourth, and most important, the social determinants that underlie racial/ethnic disparities in diabetes need to be better characterized and confronted.

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