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PREVALENCE OF DIAGNOSED AND UNDIAGNOSED TYPE 2 DIABETES MELLITUS AMONG US ADOLESCENTS: RESULTS FROM THE CONTINUOUS NHANES, 1999–2010

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We read with great interest the article by Demmer et al. (1) recently published in the *Journal*. We agree that national surveillance efforts for diabetes among this age group are important to assess and monitor the burden of disease.

The National Health and Nutrition Examination Survey (NHANES) allows us to monitor and track the nation's health. In fact, the Centers for Disease Control and Prevention (Atlanta, Georgia) rely on NHANES for our national estimates of the burden of diagnosed and undiagnosed diabetes among adults in the United States (2, 3). Estimates from NHANES for prevalence of diagnosed and undiagnosed diabetes among youth have not been included as part of the National Diabetes Surveillance System because of concerns with the low absolute number of cases precluding comparisons by demographic groups.

In fact, we are concerned with the reliability of many of the estimates presented by the authors and, subsequently, with many of the inferences the authors draw from the data. The NHANES Analytic Guidelines, published by the National Center for Health Statistics (Hyattsville, Maryland), state, "The minimum sample size is determined by the statistic to be estimated (e.g., mean, total, proportion …), the reliability criteria (e.g., 20 or 30 percent relative standard error), the Design Effect for the statistics (DEFF defined as the variance inflation factor), and the degrees of freedom for the standard error estimate" (4, p.10).

The relative standard error is defined as the standard error divided by the prevalence estimate and multiplied by 100%. Based on our own analysis from the interview sample of adolescents for all diabetes and diabetes type as defined in the article, we found that the relative standard error was greater than 30% for many subgroups presented (Table 1). When the more conservative criterion of a relative standard error of less than 20% is applied, virtually all of the estimates are subject to cautious interpretation and inference (Table 1).

We agree with Demmer et al. when they state, "However, neither the sex difference nor the racial/ethnic differences were statistically significant, which makes it possible that these variations were due to chance. Studies with higher numbers of diabetes cases will be

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required to definitively examine these trends (1, p.6).” Given the poor reliability of the existing data, one could expect no other conclusion.

In addition to these concerns about reliability, we also caution interpretation of any absolute numbers. As the authors state in the methods, “Survey weights are necessary to account for nonresponse and oversampling (1, p.2).” Yet, the authors go on to compare absolute numbers of cases in the results and suggest that the estimates and unweighted numbers are difficult to interpret. On the basis of these concerns, we urge readers to interpret the results and inferences with caution.

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Table 1

Relative Standard Error[a] for Prevalence Estimates of Self-reported Diabetes Mellitus Among Adolescents Aged 12–19 Years, National Health and Nutrition Examination Survey, 1999–2010

Characteristic	Relative Standard Error[a]		
	All DM	T1DM	T2DM
Male	23	26	40
Female	33	46	31
Non-Hispanic white	24	28	47
Non-Hispanic black	24	36	31
Mexican American	32	64	33
Other Hispanic	76	76	0
Other	60	78	100
Total	17	21	28

Abbreviations: DM, diabetes mellitus; T1DM, type 1 diabetes mellitus; T2DM, type 2 diabetes mellitus.

[a]Relative standard error = (standard error/prevalence) × 100%.