



The War Is Not Yet Won

Diabetes Care 2017;40:1152–1153 | <https://doi.org/10.2337/dci17-0008>

Laura A. Young and John B. Buse

In this issue of *Diabetes Care*, Selvin and Ali (1) have done a masterful job of exploring and explaining both the rise in the incidence of diabetes over 20 years and the fall in the incidence of diabetes over the last 5 years in the U.S. You may want to skip this and just read their article. The bottom line is that we as clinicians can confirm that they, as epidemiologists, have almost certainly gotten it right. Importantly, their analysis has critical implications for policy makers.

There are a couple of critical definitions that need to be clarified. First, the term “incidence” refers to an annual rate of new diagnoses. That is the feature of diabetes explored in this article and here refers specifically to the number of people who report in a survey that a health care professional told them for the first time that they had diabetes in the last year. That number has dropped about 20% since 2009 (2). Incidence needs to be distinguished from “prevalence,” which refers to the number or proportion affected by a condition. For diabetes, that is a number that continues to rise and is only peripherally addressed (3).

While clinicians tend to not focus on research methodology, in this case the methods are crucial to understand. The data from which incidence rates are derived is national survey data. These data are the best we have. But as has become clear in recent elections, surveys have inherent issues and are arguably more

challenging to administer and interpret today than in the past (4). A positive response in such a survey is the culmination of many factors, each with secular trends—a person responded to the survey, they understood the question, they saw a health care provider in the last year, the provider screened for diabetes, the provider communicated the result of the test appropriately, the patient understood the communication, and the patient was willing to disclose the result during the survey. At the base of that pyramid of issues is the fact that people are rapidly changing the way that they communicate with others and different segments of the population are changing in different ways. The authors point out that the observation is supported by data from insured populations in data from health systems and claims data, again with inherent limitations, as there are major changes across the country and particularly in some communities in the proportion and demographics of the population that is insured. Though we do believe that Selvin and Ali are correct, it must be kept in mind that they base their observations on imprecise data.

Selvin and Ali’s focus is not really on the rise and fall of the incidence of diabetes; their article is an exploration of the reasons for the trend and the implications of their understanding. The story the authors develop is compelling and worth reflection. In the early 1990s, the rate of

newly diagnosed diabetes in the U.S. began to rise sharply from about 4 per 1,000 person-years from 1980–1991 to over 8 per 1,000 patient-years in 2008 with seemingly no end in sight (2). The rate reported is age adjusted, so the increasing age of the population was not contributing to the rise. Changing demography and obesity rates certainly contributed to the trend but obviously did not change abruptly as seems the case for the incidence of diabetes. Starting in 2009 and continuing since, the incidence rate of diabetes seems to be falling; however, biological factors cannot explain this rapid change.

As Selvin and Ali point out, important nonbiological factors may explain much of the rise and fall in incidence. First, in 1997 the American Diabetes Association loosened the diagnostic criteria for diabetes by lowering the fasting glucose cut point from 140 mg/dL to 126 mg/dL. Second, in 2010 the American Diabetes Association broadened the criteria to include using glycated hemoglobin A_{1c} (HbA_{1c}) for diagnosis. While the intent was to enable the diagnosis of diabetes in the nonfasting state, the HbA_{1c} purposefully is a more specific (fewer false positives) and less sensitive (more false negatives) criterion and has been widely adopted (5). Third, along with the changing criteria came increased efforts at screening for diabetes. Over the last 30 years the proportion of people with diabetes who are

University of North Carolina School of Medicine, Chapel Hill, NC

Corresponding author: Laura A. Young, laura_young@med.unc.edu.

© 2017 by the American Diabetes Association. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. More information is available at <http://www.diabetesjournals.org/content/license>.

See accompanying article, p. 1139.

undiagnosed has decreased from over 50% to about 11%. This is a crucial understanding. Biology changes slowly, and almost certainly the story of both the abrupt rise and fall in incidence of diabetes is really a story of changing guidelines and health policy.

The most important statement from their article is “the war is not yet won.” There is no inherent reason to celebrate the decline in incidence seen in adults. It is a victory of sorts, but the number of people living with diabetes is staggering and increasing. An alarmingly high and increasing proportion of our nation’s health care resources are expended in the care of diabetes and its complications and comorbidities. The burden of diabetes care not only impacts the quality of life of hundreds of millions of people globally but also stresses our health care systems and as a result our society to near the breaking point. Recent trends examining the incidence of diabetes in youth in the U.S. demonstrated significant increases, particularly in racial and ethnic groups other than non-Hispanic whites (6). One can only imagine the impact this will have on our health care system. That said, we have almost certainly arrived at a time and place where

the ability to prevent diabetes and diagnose early and treat adequately allows at least the socially and financially gifted the ability to stave off diabetes-related complications. The war is not won, but the battle has changed from diagnosis to population-wide implementation of health policies to ensure cost-effective efforts at prevention—prevention of diabetes and prevention of diabetes complications.

Duality of Interest. L.A.Y. receives research support (paid to the University of North Carolina) from Boehringer Ingelheim, Eli Lilly and Company, GI Dynamics, Halozyme Therapeutics, Johnson & Johnson, Lexicon Pharmaceuticals, Medtronic, Novo Nordisk, Orexigen Therapeutics, PhaseBio, Sanofi, Takeda, Tolerx, Scion NeuroStim, and Bristol-Myers Squibb. J.B.B. is a consultant/investigator for Andromeda, AstraZeneca, Boehringer Ingelheim, Eli Lilly and Company, GI Dynamics, Halozyme Therapeutics, GlaxoSmithKline, F. Hoffmann-La Roche, Intarcia Therapeutics, LipoScience, Merck, Metabolon, Metavention, Osiris, Pfizer, Quest Diagnostics, Rhythm Pharmaceuticals, Spherix, vTv Therapeutics, Johnson & Johnson, Lexicon Pharmaceuticals, Medtronic, Novo Nordisk, Orexigen Therapeutics, PhaseBio, Sanofi, Takeda, Tolerx, Scion NeuroStim, and Bristol-Myers Squibb. L.A.Y. and J.B.B. report that the University of North Carolina has licensed its interests in

copyright works to Telcare of a glucose messaging and treatment algorithm for the purpose of commercialization.

References

1. Selvin E, Ali MK. Declines in the incidence of diabetes in the U.S.—real progress or artifact? *Diabetes Care* 2017;40:1139–1143
2. Centers for Disease Control and Prevention. Annual number (in thousands) of new cases of diagnosed diabetes among adults aged 18–79 years, United States, 1980–2014 [Internet]. Centers for Disease Control and Prevention, 2015. Available from <https://www.cdc.gov/diabetes/statistics/incidence/fig1.htm>. Accessed 6 April 2017
3. Centers for Disease Control and Prevention. Number (in millions) of civilian, non-institutionalized persons with diagnosed diabetes, United States, 1980–2014 [Internet]. Centers for Disease Control and Prevention, 2015. Available from <https://www.cdc.gov/diabetes/statistics/prev/national/figpersons.htm>. Accessed 6 April 2017
4. Zukin C. What’s the matter with polling? [article online]. *The New York Times*, 20 June 2015. Available from https://www.nytimes.com/2015/06/21/opinion/sunday/whats-the-matter-with-polling.html?_r=0. Accessed 6 April 2017
5. International Expert Committee. International Expert Committee report on the role of the A1C assay in the diagnosis of diabetes. *Diabetes Care* 2009;32:1327–1334
6. Mayer-Davis EJ, Lawrence JM, Dabelea D, et al.; SEARCH for Diabetes in Youth Study. Incidence trends of type 1 and type 2 diabetes among youths, 2002–2012. *N Engl J Med* 2017;376:1419–1429