

## VIEWPOINT

# What We Don't Talk About When We Talk About Preventing Type 2 Diabetes—Addressing Socioeconomic Disadvantage

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**About half of the adults** in the United States have either diabetes (mostly type 2), or prediabetes.<sup>1</sup> Societies across the globe have been generating people living with diabetes at a fast pace, a pace that shows signs of stabilizing in the United States.<sup>1</sup> Yet, there is a sustained increase in the incidence of diabetes in people with lower socioeconomic status.<sup>1</sup> That a rampant diabetes epidemic is preferentially impacting the disadvantaged shines light on the problematic way in which we have chosen to respond. This approach—to prevent diabetes 1 person at a time—has hampered our response as a society to the diabetes epidemic. The substantial investment of resources in a unidimensional strategy, despite limited evidence of benefit, threatens the viability of health care systems (ie, their ability to meet expanded needs of the population with constrained resources), and sets an ineffective precedent for the way that we address epidemics.

The Centers for Disease Control (CDC) and the American Medical Association (AMA), as well as Congress, UnitedHealthcare and other insurers, employers and other community agencies, have invested in implementing programs that require clinicians to identify people who are at risk for diabetes and to refer each of them to community partners, such as local YMCAs, to take part in a year-long intensive intervention to modify diet and activity. For these interventions to succeed, long-term and constant effort is necessary from clinicians and the individuals at risk.<sup>2,3</sup> Importantly, these efforts do not have an effect on the underlying conditions—poverty, income inequality, loneliness, and socioeconomic stress—that are conducive to more obesity and more cases of diabetes. A more considerate and broad approach to diabetes prevention is needed, an approach that does not place the responsibility for prevention solely on the willpower of individuals and which addresses the diabetogenicity of our societies.

## Socioeconomic Status and Diabetes

Most people with diabetes live in low- and middle-income countries. Until the late 1970s, cardiovascular disease, which is frequently associated with diabetes, was believed to be more common among people with higher-salary, higher-stress jobs.<sup>4</sup> This association was dispelled in the seminal Whitehall study, which began in 1967 and in which male civil servants in the lower employment grades of the British Civil Service were found to have higher rates of cardiovascular mortality than men in higher grades. Several other observational and population-based studies have reported similar associations between components of socioeconomic status (eg, edu-

cation, income, and occupation), chronic disease, and mortality rates. These notable findings, however, have not led to an explosion in innovations and experiments to evaluate the value of socioeconomic interventions or national initiatives to scale up the helpful ones. We are aware of only 1 trial<sup>5</sup> that has tested a socioeconomic intervention for diabetes prevention. In this study,<sup>5</sup> published in 2011, over 4400 women with children, living in 5 urban US cities were randomly assigned to (1) vouchers and assistance to move to a more affluent neighborhood, (2) a relocation voucher without restriction of location or, (3) no assistance. Results at 10 to 15 years of follow-up showed that both socioeconomic measures (the first more than the second) were related to a reduction in the prevalence of diabetes and obesity when compared with the no assistance control group.<sup>5</sup>

The biological basis for the association between socioeconomic status and the development of diabetes remains open to debate. Modifiable risk factors, such as obesity, alcohol consumption, diet, and physical activity account for one-third to one-half of the association between diabetes and socioeconomic status. Factors such as lack of autonomy, stress, hopelessness, and material deprivation have been suggested as explanations for the rest of the association. These factors have in common that they produce unrelenting psychosocial stress and wear and tear on the body, which is often referred to as "allostatic load." Thus, the body cannot reach biological homeostasis owing to excessive and persistent external stressors. The persistent stress, in turn, according to this hypothesis, leads to a sustained increase in stress hormones and subsequent development of diabetes and other chronic conditions.<sup>4</sup>

## Current Approach to Diabetes Prevention

The 2013 American Diabetes Association scientific statement on socioeconomic determinants of prediabetes and type 2 diabetes<sup>6</sup> encouraged the development and testing of interventions that address the social context as a strategy to curb the diabetes epidemic. Yet, current initiatives continue to rely on pivotal diabetes prevention trials that showed about a 50% reduction in the progression to diabetes in high-risk individuals. These initiatives advocate a clinical program of tailored and supervised lifestyle modifications delivered to 1 person at a time. In fact, this approach is so pervasive that the CDC's and the AMA's new "National Initiative to Prevent Diabetes" encourages people to seek consultation with their physicians for testing for prediabetes and for physicians to refer patients who are at risk of developing diabetes to a year-long, "one-by-one" diabetes prevention program.<sup>7,8</sup>

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There are limitations to preventing type 2 diabetes with lifestyle modification programs. Estimates of the magnitude of the impact of preventive interventions may be inaccurate when applied to a broader population, with different diagnostic criteria from those of early trials.<sup>9</sup> Increased workload for clinicians, diversion of resources from patients diagnosed with diabetes to those who are at-risk,<sup>3,9</sup> lack of information about the sustainability of behavioral changes, and lack of evidence for cost-effectiveness for large-scale implementation of these programs have also been cited as limitations.<sup>9</sup> These “one-by-one” programs require active participation on the part of the individual, regardless of the challenges in their life and without changing the conditions of their life. Healthcare inequities, which are most likely to affect people who also are at high risk of diabetes, are likely to be produced and propagated by a clinical approach, because people at high risk may not seek health care for primary prevention of type 2 diabetes.

The omission of socioeconomic interventions overlooks the enormity of the problem. The underlying assumption is that the fundamental issue is poor individual behavior: half of humanity is making poor choices and living with the consequences. The current paradigm, then, endorses improving each individual patient and clinician's behavior as the solution yet obviates the social, environmental, and economic factors that drive the epidemic. Prospects for change are not encouraging. In a comprehensive search in ClinicalTrials.gov and Grants.gov conducted in January, 2016, we found only 1 ongoing trial considering socioeconomic aspects of diabetes prevention<sup>10</sup> and 3 NIH initiatives to fund such interventions. Despite the dearth of studies, there is an auspicious opportunity to test social interventions in trials.

## Starting the Conversation

At present, type 2 diabetes is a global epidemic that imposes burdens at an individual and public health level. A clinical approach does not match the scale of the epidemic and is likely to exclude those individuals most vulnerable to diabetes. There is perhaps better support and funding in the health care system for diabetes prevention than in society at large. But persevering with a clinical approach to prevention because the money is in health care is equivalent to not looking for our keys where we lost them, but where there is enough light to find them. A better approach is needed.

The effect of low socioeconomic status and behavioral risk factors calls for policies to decrease poverty and inequality in opportunities, and to improve education. It also calls for environments, such as safe sidewalks and effective public transportation, and contexts that reduce loneliness and make healthy behaviors easy to adopt or even the default.<sup>2</sup> How can stable housing, food accessibility, safe neighborhoods, and economic empowerment help fight the diabetes epidemic? Answering this question will require a concerted effort from investigators, policymakers, and public and private entities that fund research to test these interventions and their implementation at scale. Importantly, these interventions should result from active collaboration with the communities in which they must be implemented. The effects, if any, on the incidence of diabetes and other chronic conditions could be used to evaluate if such programs are successful. A change in priorities to support the testing and implementation of socioeconomic interventions for diabetes prevention has the potential to improve both individual and societal health.

### ARTICLE INFORMATION

**Correction:** There was a tagging error in the byline causing the middle initial to appear with the last name for indexing purposes. Victor M. Montori's name has been corrected online on January 2, 2016.

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