

EDITORIALS



Global Health Effects of Overweight and Obesity

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The Global Burden of Disease (GBD) study that is now reported in the *Journal* offers a discouraging reminder that the global obesity epidemic is worsening in most parts of the world and that its implications regarding both physical health and economic health remain ominous.¹ The study, in which researchers assembled data from 195 countries to model trends in overweight and obesity and related morbidity and mortality, showed that the prevalence of obesity has more than doubled since 1980 and is now 5% in children and 12% in adults — findings that mirror similar global trends in type 2 diabetes. Apart from a possible recent plateau in the prevalence of obesity in high-income countries, the prevalence has increased in all other sociodemographic strata.

On the encouraging side, despite this increase in prevalence, the effect of high body-mass index (BMI) on population-level age-adjusted rates of death and disability has not grown, which suggests that obese persons are healthier and live longer now than in previous decades because of better care and risk-factor management. Unfortunately, even this success brings a new burden, since the mix of increased prevalence and decreased mortality leads to more years spent with obesity and more time for the damaging coexisting illnesses, such as type 2 diabetes and chronic kidney disease, to develop.

The most worrisome finding is the approximate tripling of obesity seen in youth and young adults of developing, middle-income countries such as China, Brazil, and Indonesia. An early onset of obesity is likely to translate into a high cumulative incidence of type 2 diabetes, hypertension, and chronic kidney disease. These findings come on the heels of reports from the

United States that the incidence of type 2 diabetes in youth has increased substantially in minority populations, and when type 2 diabetes occurs in youth, it brings a much higher prevalence of complications than does type 1 diabetes.^{2,3} Since reductions in diabetes complications have been dominated by improvements among older adults, an increased incidence of diabetes among children may shift a proportionately greater load of morbidity into middle age⁴ and spread the burden of chronic disease more fully across the entire age distribution, even as populations continue to age.

The findings of the GBD investigators are an impressive and essential effort to provide policymakers with both global and country-specific estimates that most countries alone lack. However, some of the modeling assumptions in the current report might obscure important variation in both the threats and the successes underlying the obesity epidemic. First, the assumption that the risk of outcomes at any given level of obesity is uniform across populations could skew morbidity estimates. For example, at any given level of BMI, Asians have been shown to have a higher absolute risk of diabetes and hypertension and African Americans to have a lower risk of cardiovascular disease than other groups.⁵ Once chronic conditions such as diabetes and cardiovascular disease develop, the associated relative risk of death may vary according to location — as was recently seen in Mexico, where the relative risk of death associated with diabetes far exceeds that in the United States and Europe.⁶ Second, there may be important, missed variation in the high end of the BMI distribution, which disproportionately drives the development of type 2 diabetes and other coexisting illnesses.⁷

In some regions, the high prevalence of severe obesity may persist even when levels of overweight and obesity appear to plateau. Finally, global findings only hint at some of the actual successes in prevention that may finally be under way. In the United States, the past decade has brought an apparent peak and plateau in the prevalence of obesity and diagnosed diabetes, decreases in the intake of overall calories and of sugared beverages, and increasing levels of physical activity.⁸⁻¹⁰ Similarly, more communities in the United States now report reductions in the incidence of childhood obesity and adult type 2 diabetes.

Gaps in available data have forced the GBD researchers to make the best of a checkerboard of periodic and suboptimal data to provide a global picture. However, the magnitude of obesity-related morbidity and the demands for effective public health decision making point to the need for improvements in at least three types of data: efficient, continuous surveillance systems to assess risk factors, prevalence, care, and outcomes of chronic diseases; cohorts in more diverse populations to capture variation in progression to outcomes; and platforms for natural experimental studies to determine which of the interventions are working locally and why. Although obesity and diabetes have become a shared global burden requiring a strong response from governments, their determinants and effects — and particularly their solutions — also depend on the specific environment in which people live. Better data systems would permit policymakers in the hardest hit areas of the world to respond more quickly and to shorten the long learning period that is typically required to overcome chronic diseases.

The views expressed in this editorial are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Disclosure forms provided by the authors are available with the full text of this editorial at NEJM.org.

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1. GBD 2015 Obesity Collaborators. Health effects of overweight and obesity in 195 countries over 25 years. *N Engl J Med* 2017; 377:13-27.
2. Mayer-Davis EJ, Lawrence JM, Dabelea D, et al. Incidence trends of type 1 and type 2 diabetes among youths, 2002–2012. *N Engl J Med* 2017;376:1419-29.
3. Dabelea D, Stafford JM, Mayer-Davis EJ, et al. Association of type 1 diabetes vs type 2 diabetes diagnosed during childhood and adolescence with complications during teenage years and young adulthood. *JAMA* 2017;317:825-35.
4. Gregg EW, Sattar N, Ali MK. The changing face of diabetes complications. *Lancet Diabetes Endocrinol* 2016;4:537-47.
5. Karter AJ, Schillinger D, Adams AS, et al. Elevated rates of diabetes in Pacific Islanders and Asian subgroups: the Diabetes Study of Northern California (DISTANCE). *Diabetes Care* 2013; 36:574-9.
6. Alegre-Díaz J, Herrington W, López-Cervantes M, et al. Diabetes and cause-specific mortality in Mexico City. *N Engl J Med* 2016;375:1961-71.
7. Kivimaki M, Kuosma E, Ferrie JE, et al. Overweight, obesity, and risk of cardiometabolic multimorbidity: pooled analysis of individual-level data for 120 813 adults from 16 cohort studies from the USA and Europe. *Lancet Public Health* 2017 May 19 (Epub ahead of print).
8. Ogden CL, Carroll MD, Lawman HG, et al. Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014. *JAMA* 2016;315:2292-9.
9. Prevalence of childhood obesity in the United States, 2011-2014. Atlanta: Centers for Disease Control and Prevention (<https://www.cdc.gov/obesity/data/childhood.html>).
10. Geiss LS, Kirtland K, Lin J, et al. Changes in diagnosed diabetes, obesity, and physical inactivity prevalence in US counties, 2004-2012. *PLoS One* 2017;12(3):e0173428.

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An Oral GnRH Antagonist for Endometriosis — A New Drug for an Old Disease

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Endometriosis, a chronic gynecologic disease characterized by attachment and proliferation of endometrial cells outside the endometrial cavity, occurs in 6 to 10% of women of reproductive age¹ and is associated with dysmenorrhea, nonmenstrual pelvic pain, dyspareunia, and infertility. The dis-

ease is also associated with an increased prevalence of depression, reduction in sexual satisfaction, disrupted personal relations, and loss of work leading to substantial economic cost. The pathogenesis is incompletely understood, but estrogen is integral to endometrial proliferation and function.