

Researcher finds mortality risks of being overweight or obese are underestimated

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New research by Andrew Stokes, a doctoral student in demography and sociology in the School of Arts and Sciences at the University of Pennsylvania, suggests that many obesity studies substantially underestimate the mortality risks associated with excess weight in the United States. His study, "Using Maximum Weight to Redefine Body Mass Index Categories in Studies of The Mortality Risks of Obesity," was published in the March issue of the open-access journal *Population Health Metrics*.

"The scholarly community is divided over a large meta-analysis that found that overweight is the optimal BMI category and that there are no increased risks associated with obese class 1," Stokes said.

Normal [weight](#) is indicated by a BMI of 18.5-24.9 kg/m², overweight is indicated by a BMI of 25.0-29.9 kg/m², obese class 1 is a BMI of 30.0-34.9 kg/m² and obese class 2 is a BMI of 35.0 kg/m² and above.

Skeptics of the meta-analysis argue that the findings are likely driven by biases, especially by illness-induced weight loss.

"Using BMI at the time of the survey to assess the mortality risks of [overweight and obesity](#) is problematic, especially in older populations, because slimness can be a marker of illness," Stokes said.

Researchers have attempted to address this bias by eliminating ill people from their samples; however, according to Stokes, such measures are

inadequate because information on illness is ascertained by self-reporting and not everyone with an illness has been diagnosed.

Stokes used individuals' highest BMI in life to predict mortality rates. He said that in the previous literature, the normal weight category combines data from low-risk, stable-weight individuals with high-risk individuals who have experienced weight loss. Use of weight histories makes it possible to separate the two groups and redefine the reference category as people who were a consistently normal weight throughout their lives.

Stokes conducted the analyses using data from the National Health and Nutrition Examination Surveys of 1988-1994 and 1999-2004 linked to the National Death Index through 2006 on U.S. adults ages 50-84 who never smoked.

He found that the percentage of mortality attributable to overweight and obesity in this group was 33 percent when assessed using maximum BMI. The comparable figure obtained using BMI at the time of survey was substantially smaller at 5 percent.

"The source of the discrepancy became clear when I started looking more closely at peoples' weight histories," Stokes said.

Stokes said that a considerable fraction of individuals classified as normal weight using BMI at time of survey were formerly overweight or obese. This group had substantially elevated [mortality rates](#) compared to individuals that were consistently [normal weight](#) throughout their lives, suggesting that for many of them the [weight loss](#) was related to an illness.

He concluded that the findings provide simple and compelling evidence that the prior literature underestimates the impact of obesity on levels of mortality in the U.S. But Stokes said that his results need corroboration

in future studies because maximum BMI was calculated from peoples' recollection of their maximum weight, which may be subject to recall error. He said that his analysis should be replicated using longitudinal data with contemporaneous measures of height and weight across the lifecycle.

For the past five years Stokes has worked on projects related to obesity and diabetes with Samuel Preston, a professor of sociology at Penn, as part of a grant from the National Institute on Aging.

Provided by University of Pennsylvania

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