

# Effects of obesity on death rates understated in prior research, study shows

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Credit: Peter Häger/Public Domain

Researchers from the Boston University School of Public Health and the University of Pennsylvania have found that prior studies of the link between obesity and mortality are flawed because they rely on one-time measures of body mass index (BMI) that obscure the health impacts of weight change over time.

The study, published online in the journal *Proceedings of the National Academy of Sciences*, maintains that most [obesity](#) research, which gauges weight at only a single point in time, has underestimated the effects of [excess weight](#) on mortality. Studies that fail to distinguish between people who never exceeded [normal weight](#) and people of normal weight who were formerly overweight or obese are misleading because they neglect the enduring effects of past obesity and fail to account for the fact that weight loss is often associated with illness, the researchers said.

When such a distinction is made, the study found, adverse health effects grow larger in weight categories above the normal range, and no protective effect of being overweight is observed.

"The risks of obesity are obscured in prior research because most of the studies only incorporate information on weight at a single point in time," said lead author Andrew Stokes, assistant professor of global health at BUSPH. "The simple step of incorporating weight history clarifies the risks of obesity and shows that they are much higher than appreciated."

Stokes and co-author Samuel Preston, professor of sociology at the University of Pennsylvania, tested a model that gauged obesity status through individuals' reporting of their lifetime maximum weight, rather than just a 'snapshot' survey weight. They found that the death rate for people who were normal weight at the time of survey was 27 percent higher than the rate for people whose weight never exceeded that category.

They also found a higher prevalence of both diabetes and cardiovascular disease among people who had reached a higher-than-normal BMI and then lost weight, compared to people who remained in a high BMI category.

Stokes and Preston argue that using "weight histories" in studies of

obesity and mortality is important for two reasons. One reason is that obesity at a particular age may predispose people to illness, regardless of subsequent weight loss. The other is that weight loss is often caused by illness.

The researchers used data from the large-scale 1988-2010 National Health and Nutrition Examination Survey, linking the data to death certificate records through 2011. The survey asked respondents to recall their maximum lifetime weight, as well as recording their weight at the time of the survey.

Of those in the normal-weight category at the time of the survey, 39 percent had transitioned into that category from higher-weight categories.

The study used statistical criteria to compare the performance of various models, including some that included data on weight histories and others that did not. The researchers found that weight at the time of the survey was a poor predictor of mortality, compared to models using data on lifetime maximum weight.

"The disparity in predictive power between these models is related to exceptionally high mortality among those who have lost weight, with the normal-weight category being particularly susceptible to distortions arising from weight loss," the researchers said. "These distortions make overweight and obesity appear less harmful by obscuring the benefits of remaining never obese."

The study comes amid controversy over the relationship between obesity and mortality, with some recent studies indicating that excess weight is a protective factor in health. One such study, a major meta-analysis in 2013 led by a researcher with the Centers for Disease Control and Prevention, indicated that being overweight was associated with lower

mortality, and that slight obesity conferred no excess risk of death.

A number of past studies have shown that people who lose weight have higher rates of death than those who maintain their weight over time. Part of the reason for that disparity is that illness may be a cause of [weight loss](#), through decreased appetite or increased metabolic demands. Few studies have adequately accounted for that source of bias, Stokes and Preston noted.

They urged more research using [weight](#) histories, saying such an approach had proven valuable in studies of smoking, which distinguish between former and current smokers and those who have never smoked.

**More information:** Revealing the burden of obesity using weight histories, *Proceedings of the National Academy of Sciences*, [www.pnas.org/cgi/doi/10.1073/pnas.1515472113](http://www.pnas.org/cgi/doi/10.1073/pnas.1515472113)

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