

# Excess weight, obesity more deadly than previously believed

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Excess weight or obesity boosts risk of death by anywhere from 22% to 91%—significantly more than previously believed—while the mortality risk of being slightly underweight has likely been overestimated,

according to new University of Colorado Boulder research.

The findings, published Feb. 9 in the journal *Population Studies*, counter prevailing wisdom that excess [weight](#) boosts [mortality risk](#) only in extreme cases.

The [statistical analysis](#) of nearly 18,000 people also shines a light on the pitfalls of using Body Mass Index (BMI) to study health outcomes, providing evidence that the go-to metric can potentially bias findings. After accounting for those biases, it estimates that about 1 in 6 U.S. deaths are related to excess weight or obesity.

"Existing studies have likely underestimated the [mortality](#) consequences of living in a country where cheap, unhealthy food has grown increasingly accessible and [sedentary lifestyles](#) have become the norm," said author Ryan Masters, associate professor of sociology at CU Boulder. "This study and others are beginning to expose the true toll of this public health crisis."

## **Challenging the 'obesity paradox'**

While numerous studies show that heart disease, [high blood pressure](#) and diabetes (which are often associated with being overweight) elevate mortality risk, very few have shown that groups with higher BMIs have higher mortality rates.

Instead, in what some call the 'obesity paradox,' most studies show a U-shaped curve: Those in the "overweight" category (BMI 25 to 30) surprisingly have the lowest mortality risk. Those in the "obese" category (30 to 35) have little or no increased risk over the so-called "healthy" category (18.5-25). And both the "underweight" (less than 18.5) and extremely obese (35 and higher) are at increased risk of death.

"The [conventional wisdom](#) is that elevated BMI generally does not raise mortality risk until you get to very high levels and that there are actually some survival benefits to being overweight," said Masters, a social demographer who has spent his career studying mortality trends. "I have been suspicious of these claims."

He noted that BMI, which doctors and scientists often use as a health measure, is based on weight and height only and doesn't account for differences in body composition or how long a person has been overweight.

"It's a reflection of stature at a point in time. That's it," said Masters, noting that Tom Cruise (at 5 feet 7 inches and an extremely muscular 201 pounds at one point), had a BMI of 31.5, famously putting him in the category of "obese." "It isn't fully capturing all of the nuances and different sizes and shapes the body comes in."

## **Duration matters**

To see what happened when those nuances were considered, Masters mined the National Health and Nutrition Examination Survey (NHANES) from 1988 to 2015, looking at data from 17,784 people, including 4,468 deaths.

He discovered that a full 20% of the sample characterized as "healthy" weight had been in the overweight or obese category in the decade prior. When set apart, this group had a substantially worse health profile than those in the category whose weight had been stable.

Masters pointed out that a lifetime carrying [excess weight](#) can lead to illnesses that, paradoxically, lead to rapid weight loss. If BMI data is captured during this time, it can skew study results.

"I would argue that we have been artificially inflating the mortality risk in the low-BMI category by including those who had been high BMI and had just lost weight recently," he said.

Meanwhile, 37% of those characterized as overweight and 60% of those with obese BMI had been at lower BMIs in the decade prior. Notably, those who had only recently gained weight had better health profiles.

"The health and mortality consequences of high BMI are not like a light switch," said Masters. "There's an expanding body of work suggesting that the consequences are duration-dependent."

By including people who had spent most of their life at low-BMI weight in the high-BMI categories, previous studies have inadvertently made high BMI look less risky than it is, he said.

When he looked at differences in fat distribution within BMI categories, he also found that variations made a huge difference in reported [health outcomes](#).

## **Exposing a public health problem**

Collectively, the findings confirm that studies have been "significantly affected" by BMI-related bias.

When re-crunching the numbers without these biases, he found not a U-shape but a straight upward line, with those with low BMI (18.5-22.5) having the lowest mortality risk.

Contrary to previous research, the study found no significant mortality risk increases for the 'underweight' category.

While previous research estimated 2 to 3% of U.S. adult deaths were due

to high BMI, his study pegs the toll at eight times that.

Masters said he hopes the research will alert scientists to be 'extremely cautious' when making conclusions based on BMI. But he also hopes that the work will draw attention to what he sees not as a problem for individuals alone to solve, but rather a public health crisis fueled by an unhealthy or "obesogenic" environment in the U.S.

"For groups born in the 1970s or 1980s who have lived their whole lives in this obesogenic environment, the prospects of healthy aging into older adulthood does not look good right now," he said. "I hope this work can influence higher-level discussions about what we as a society can do about it."

**More information:** Ryan K. Masters, Sources and severity of bias in estimates of the BMI–mortality association, *Population Studies* (2023). DOI: [10.1080/00324728.2023.2168035](https://doi.org/10.1080/00324728.2023.2168035)

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