

# Heavy body shape across lifespan associated with highest mortality

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People who are lean for life have the lowest mortality, while those with a heavy body shape from childhood up to middle age have the highest mortality, reveal findings of a large study published in *The BMJ* today.

Obesity has become a public health crisis in most countries worldwide. While high [body mass index](#) in adulthood has been linked to increased mortality risk, uncertainty exists over any association between [body size](#) over the life course and mortality.

So a US team of researchers tracked the evolution of [body](#) shape and associated mortality among two large cohort studies.

In total, 80,266 women and 36,622 men enrolled in the Nurses' Health Study and Health Professionals Follow-up Study, recalled their [body shape](#) at ages 5, 10, 20, 30, and 40 years.

They also provided [body mass](#) index at age 50, and were followed from age 60 over a median of 15-16 years for death. They answered detailed questionnaires on lifestyle and medical information every two years, and on diet every four years.

Among the cohort, five distinct body shapes were identified from age 5 to 50: lean-stable, lean-moderate increase, lean-marked increase, medium-stable/increase, and heavy-stable/increase (see figure 1).

Results showed that people who remained stably lean throughout life had

the lowest mortality, with a 15-year risk of death being 11.8% in women, and 20.3% in men.

Those who reported being heavy as children and who remained heavy or gained further [weight](#), especially during middle age, had the highest mortality, with a 15-year risk of death being 19.7% in women and 24.1% in men.

The authors conclude: "our findings provide further scientific rationale for recommendations of weight management, especially avoidance of weight gain in middle life, for long-term health benefit."

In a second study, an international team of researchers confirm that increasing levels of body mass index (BMI) are associated with higher risks of premature death.

The BMI is an established way of measuring body fat from the weight and height of a person, but the optimal BMI associated with the lowest [mortality risk](#) is not known.

It's expected that a higher BMI is associated with a reduced life expectancy, but the largest previous study showed that when compared with normal weight, overweight was associated with reduced mortality, and only high levels obesity were associated with increased mortality.

However, there were various limitations in the study, for example, smoking and prevalent or prediagnostic illness were not taken into account, both of which can lead to lower body weight, and increased mortality.

So researchers in the current study sought to clarify this association by carrying out a large meta-analysis of 230 prospective studies with more than 3.74 million deaths among more than 30.3 million participants.

They analysed people who never smoked to rule out the effects of smoking, and the lowest mortality was observed in the BMI range 23-24 among this group.

Lowest mortality was found in the BMI range 22-23 among healthy never smokers, excluding people with prevalent diseases.

And among people who never smoked, and studied over a longer duration of follow up of more than 20 and 25 years, where the influence of prediagnostic weight loss would be less, the lowest mortality was observed in the BMI range 20-22.

These findings demonstrate the importance of smoking and health conditions in the association between BMI and mortality, say the authors, and "reinforces concerns about the adverse effects of excess weight."

In a linked editorial, Sarah Wild and Christopher Byrne from the Universities of Edinburgh and Southampton, say that these studies attempt to address important questions about obesity and mortality.

They emphasise the need to maintain a healthy weight, but comment that there are "major challenges in finding effective ways to prevent weight gain, support weight loss, and prevent weight re-gain, in both individuals and populations.

**More information:** Trajectory of body shape in early and middle life and all cause and cause specific mortality: results from two prospective US cohort studies, [www.bmj.com/cgi/doi/10.1136/bmj.i2195](http://www.bmj.com/cgi/doi/10.1136/bmj.i2195)

BMI and all cause mortality: systematic review and non-linear dose-response meta-analysis of 230 prospective studies with 3.74 million deaths among 30.3 million participants,

[www.bmj.com/cgi/doi/10.1136/bmj.i2156](http://www.bmj.com/cgi/doi/10.1136/bmj.i2156)

Editorial: Obesity and mortality: understanding the patterns and paradoxes, [www.bmj.com/cgi/doi/10.1136/bmj.i2433](http://www.bmj.com/cgi/doi/10.1136/bmj.i2433)

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