



Briefing Note: Obesity and life expectancy

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Summary

A recent combined analysis of 57 international prospective studies found that Body Mass Index (BMI) is a strong predictor of mortality among adults. Overall, moderate obesity (BMI 30-35 kg/m²) was found to reduce life expectancy² by an average of three years, while morbid obesity (BMI 40-50 kg/ kg/m²) reduces life expectancy by eight to ten years. This eight to ten year loss of life is equivalent to the effects of lifelong smoking.

Key findings from studies investigating the impact of obesity on life expectancy

The Prospective Studies Collaboration meta-analysis, published in the Lancet in March 2009,¹ is the largest ever investigation of how obesity affects mortality. It brought together data from 57 long-term cohort studies mostly based in Europe, the US and Australia and involving almost 900,000 participants. Participants were followed for an average of 10 to 15 years, during which 100,000 died. The study was co-ordinated by the Clinical Trial Service Unit (CTSU) in Oxford.

Studies were eligible for inclusion in the analysis if they included BMI and mortality as outcome measures. BMI is calculated by dividing a person's weight in kilograms (kg) by the square of their height in metres (m). People were excluded from the study if there was no record of their BMI or if they were severely underweight (BMI <15 kg/m²) or severely overweight (BMI >50 kg/m²).

The effect of obesity on mortality and life expectancy at different levels of BMI (by about age 60 years) is summarised as follows:

- in both sexes, mortality was lowest in the upper end of the 'healthy' range (BMI 22.5–25 kg/m²);
- average life expectancy was reduced by two to four years in the BMI range 30–35 kg/m² (international BMI classification 'obese (class I');
- average life expectancy was reduced by eight to ten years in the BMI range 40–50 kg/m² (international BMI classification 'obese (class III)' or morbid obesity).

These are the estimated effects of becoming obese by middle age. The effects on life expectancy of becoming obese in childhood have not yet been precisely estimated.

The study also revealed excess mortality at BMI levels well below 22.5 kg/m². This effect is greater for smokers than non smokers and is not fully understood. The analysis excluded around 300 individuals with BMI 50 kg/m² or more so may have underestimated the health impact of morbid obesity.

Although not a perfect measure of adiposity, BMI is a strong predictor of overall mortality both above and below the apparent optimum of 22.5 kg/m². There is a progressive increase in all cause mortality above this range which is due mainly to vascular disease. Each 5 kg/m² increase in BMI is associated with about 30% higher overall mortality.

^a Life expectancy is the average number of years an individual of a given age is expected to live, if current mortality rates continue to apply.

By combining the relative risks of BMI with recent BMI population values, the authors predict that currently among middle-aged people (aged 50 years) in the UK, as many as 23% of vascular deaths and 6% of cancer deaths will be attributable to overweight and obesity.

A number of other studies have estimated the impact of obesity on life expectancy within the UK based on routinely available data. These include a study by Banegas et al, published in 2003,² and a study by Kelly et al from the University of Cambridge published in 2007.³ Both of these studies estimated that around 9% of all deaths were attributable to excess adiposity. The Cambridge study modelled the impact of obesity on life expectancy and predicted that, over the period 2003 to 2015, population life expectancy would be 0.28 years lower than it otherwise would be. This is comparable to the Foresight model which predicted that the increase in adiposity between 2004 and 2015 would reduce life expectancy by about 0.11 years in men and 0.02 years in women.⁴ It should be noted that these figures refer to average life expectancy for the whole population, hence will be lower than the life expectancy reductions identified in the Prospective Studies Collaboration publication for people who are obese.

In addition, a large, recently published study in the US by Finkelstein et al, modelled life expectancy using routine data. This showed a modest association between excess weight and life expectancy for those with BMI 25–35 kg/m²; for those with BMI >35kg/m², excess weight was associated with a significant reduction in life expectancy.⁵

Estimates of life expectancy based on modelling are likely to be less robust than those identified from cohort studies. Findings from modelling can also vary as a result of differences in analytical approach.⁶

References

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