

Excess Deaths Associated With Underweight, Overweight, and Obesity

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Context As the prevalence of obesity increases in the United States, concern over the association of body weight with excess mortality has also increased.

Objective To estimate deaths associated with underweight (body mass index [BMI] <18.5), overweight (BMI 25 to <30), and obesity (BMI \geq 30) in the United States in 2000.

Design, Setting, and Participants We estimated relative risks of mortality associated with different levels of BMI (calculated as weight in kilograms divided by the square of height in meters) from the nationally representative National Health and Nutrition Examination Survey (NHANES) I (1971-1975) and NHANES II (1976-1980), with follow-up through 1992, and from NHANES III (1988-1994), with follow-up through 2000. These relative risks were applied to the distribution of BMI and other covariates from NHANES 1999-2002 to estimate attributable fractions and number of excess deaths, adjusted for confounding factors and for effect modification by age.

Main Outcome Measures Number of excess deaths in 2000 associated with given BMI levels.

Results Relative to the normal weight category (BMI 18.5 to <25), obesity (BMI \geq 30) was associated with 111 909 excess deaths (95% confidence interval [CI], 53 754-170 064) and underweight with 33 746 excess deaths (95% CI, 15 726-51 766). Overweight was not associated with excess mortality (-86 094 deaths; 95% CI, -161 223 to -10 966). The relative risks of mortality associated with obesity were lower in NHANES II and NHANES III than in NHANES I.

Conclusions Underweight and obesity, particularly higher levels of obesity, were associated with increased mortality relative to the normal weight category. The impact of obesity on mortality may have decreased over time, perhaps because of improvements in public health and medical care. These findings are consistent with the increases in life expectancy in the United States and the declining mortality rates from ischemic heart disease.

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