A semiparametric analysis of the relationship of body mass index to mortality

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Objectives: I used a semi-parametric analysis of the relationship between body mass index (BMI) and mortality to assess the adequacy of conventional BMI categories for planning public health programs to reduce mortality.

Methods: I linked supplements from the 1987 and 1989 versions of the National Health Interview Survey to the 1995 Multiple Cause of Death File to obtain mortality information. I constructed nonlinear estimates of the association between BMI and mortality using a semiparametric regression technique.

Results: The mortality risk among "normal" weight men (i.e., those in the BMI range of 20 to 25 kg/m(2)) was as high as that among men in the mild obesity category (BMIs of 30-35 kg/m(2)), with a minimum risk observed at a BMI of approximately 26 kg/m(2). Among women, the mortality risk was smallest at approximately 23 to 24 kg/m(2), with the risk increasing steadily with BMIs above 27 kg/m(2). In each specification, the slope of the line was small and volatile through the BMI range of 20 to 35 kg/m(2), suggesting negligible risk differences with minor differences in weight for much of the population.

Conclusions: Traditional BMI categories do not conform well to the complexities of the BMI-mortality relationship. In concurrence with conclusions from previous literature, I found that the current definitions of obesity and overweight are imprecise predictors of mortality risk.