Whitlock G, et al. ***Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies.*** Lancet. 2009 Mar 28;373(9669):1083-96. Epub 2009 Mar 18. PMID: 19299006	Save

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Abstract

BACKGROUND: The main associations of body-mass index (BMI) with overall and cause-specific mortality can best be assessed by long-term prospective follow-up of large numbers of people. The Prospective Studies Collaboration aimed to investigate these associations by sharing data from many studies.

METHODS: Collaborative analyses were undertaken of baseline BMI versus mortality in 57 prospective studies with 894 576 participants, mostly in western Europe and North America (61% [n=541 452] male, mean recruitment age 46 [SD 11] years, median recruitment year 1979 [IQR 1975-85], mean BMI 25 [SD 4] kg/m(2)). The analyses were adjusted for age, sex, smoking status, and study. To limit reverse causality, the first 5 years of follow-up were excluded, leaving 66 552 deaths of known cause during a mean of 8 (SD 6) further years of follow-up (mean age at death 67 [SD 10] years): 30 416 vascular; 2070 diabetic, renal or hepatic; 22 592 neoplastic; 3770 respiratory; 7704 other.

FINDINGS: In both sexes, mortality was lowest at about 22.5-25 kg/m(2). Above this range, positive associations were recorded for several specific causes and inverse associations for none, the absolute excess risks for higher BMI and smoking were roughly additive, and each 5 kg/m(2) higher BMI was on average associated with about 30% higher overall mortality (hazard ratio per 5 kg/m(2) [HR] 1.29 [95% CI 1.27-1.32]): 40% for vascular mortality (HR 1.41 [1.37-1.45]); 60-120% for diabetic, renal, and hepatic mortality (HRs 2.16 [1.89-2.46], 1.59 [1.27-1.99], and 1.82 [1.59-2.09], respectively); 10% for neoplastic mortality (HR 1.10 [1.06-1.15]); and 20% for respiratory and for all other mortality (HRs 1.20 [1.07-1.34] and 1.20 [1.16-1.25], respectively). Below the range 22.5-25 kg/m(2), BMI was associated inversely with overall mortality, mainly because of strong inverse associations with respiratory disease and lung cancer. These inverse associations were much stronger for smokers than for non-smokers, despite cigarette consumption per smoker varying little with BMI.

INTERPRETATION: Although other anthropometric measures (eg, waist circumference, waist-to-hip ratio) could well add extra information to BMI, and BMI to them, BMI is in itself a strong predictor of overall mortality both above and below the apparent optimum of about 22.5-25 kg/m(2). The progressive excess mortality above this range is due mainly to vascular disease and is probably largely causal. At 30-35 kg/m(2), median survival is reduced by 2-4 years; at 40-45 kg/m(2), it is reduced by 8-10 years (which is comparable with the effects of smoking). The definite excess mortality below 22.5 kg/m(2) is due mainly to smoking-related diseases, and is not fully explained.