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Objectives

The UK population is ageing, and prevalence of obesity is increasing. To assess the likely impact of these two demographic trends, we used a stochastic all-cause, cause of death mortality model to determine changes in likely age of death associated with different body mass index (BMI) values in older adults.

Methods

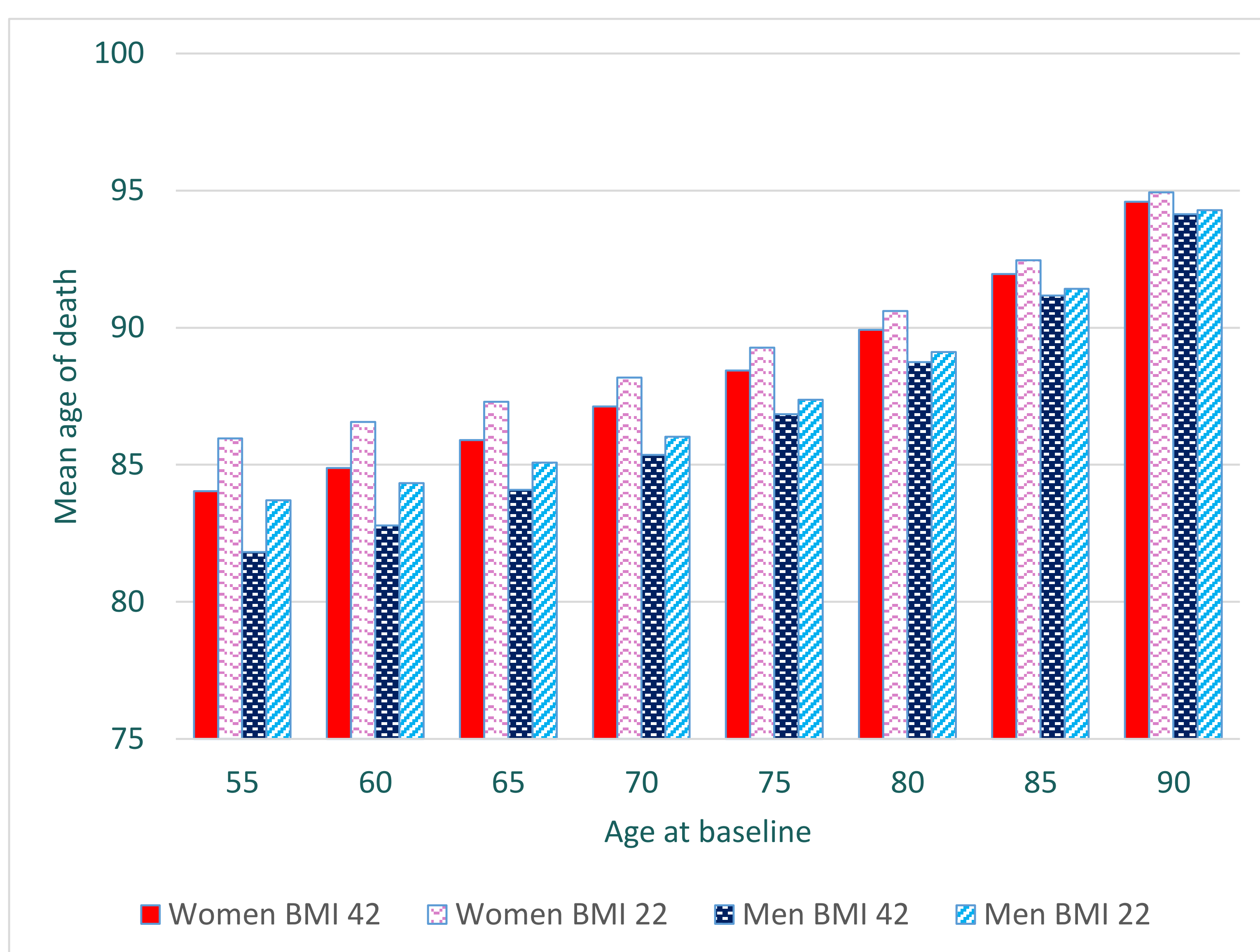
The *Sonata Vivo* model adjusts population baseline mortality for known risk factors to calculate the mean age of death and most likely causes of death for an individual, and has been validated against long-term cohorts in the UK and USA.¹ We used the model to calculate the difference in mean ages of death at BMIs of 27, 33, 37 and 42 kg/m² compared with a BMI of 22 kg/m² in men and women aged 55 to 90. We assumed all subjects were non-smokers with population average values for blood pressure, cholesterol and alcohol consumption.

Results

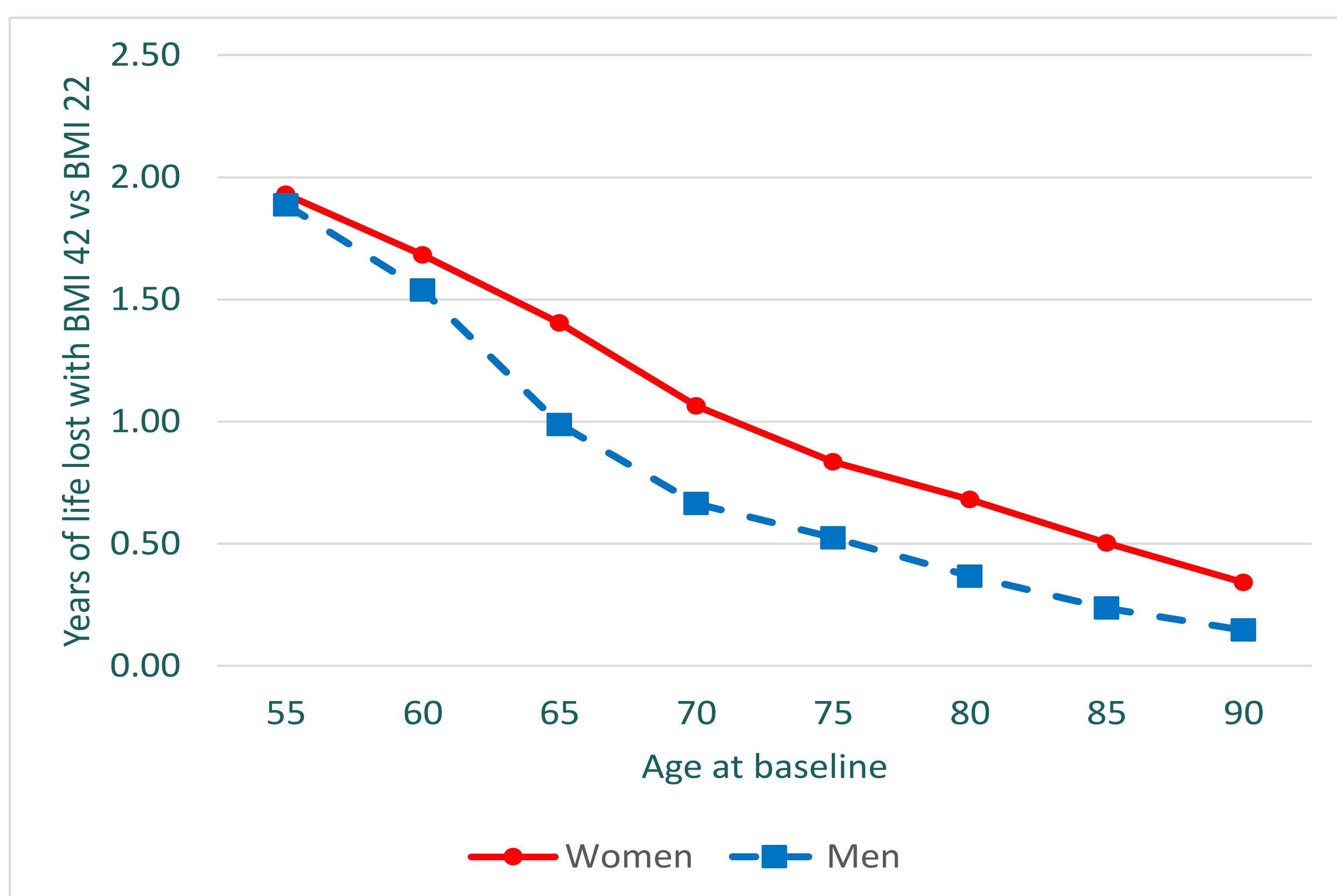
In adults aged 55 years at baseline, increasing BMI from 22 to 42 kg/m² was associated with a decrease in mean age of death of 1.93 years in women and 1.89 years in men. The absolute difference in life expectancy across the BMI range decreased with increasing age at baseline, to 0.34 years in women and 0.15 years in men aged 90. As expected, the model predicts a longer life expectancy in women than men at each age and BMI, but the relative difference between genders was smaller in those with a BMI of 42 kg/m² than in those with a BMI of 22 kg/m².

Analysis by likely cause of death in 55 year old adults showed the main impact of obesity was on cardiovascular (CVD) and cancer deaths in women, and CVD and endocrine deaths (which includes diabetes) in men.

Mean age of death for men and women of different ages, with BMI of 22 versus 42 kg/m²



Mean years of life lost for men and women of different ages, with BMI of 22 versus 42 kg/m²



References

1. Martin CJ (2013). *Individualized modelling of mortality by cause based upon risk factors*. PhD thesis, University College, London. Available from <http://discovery.ucl.ac.uk/1395578/>

Conclusions

Obesity is likely to reduce life expectancy by up to 2 years in middle-aged adults in the UK, mainly from increased CVD mortality.

