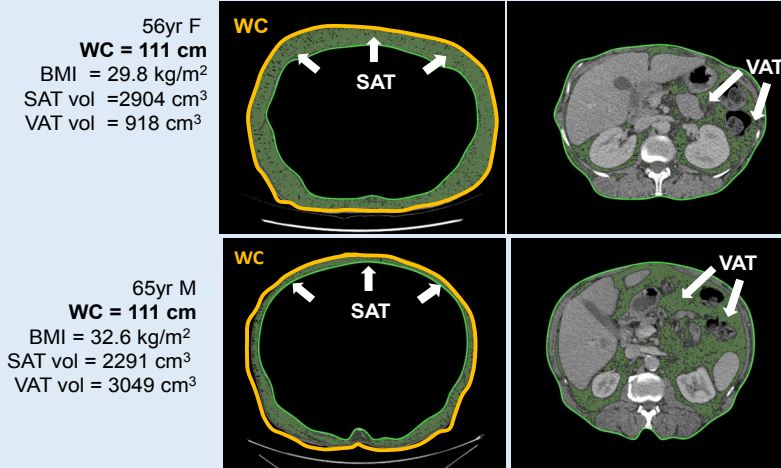


Supplementary information S2 | **Measures of abdominal adiposity, BMI and cancer risk**

Whether measures of abdominal adiposity are more informative or stronger than BMI as a ‘predictor’ of cancer incidence is not a trivial question.

WC (and the waist component of WHR) consists of subcutaneous (SAT) and visceral adipose tissue (VAT). The correlation between WC and VAT is moderate (as illustrated here)*.



Case study: two persons with equivalent WC measurements (111 cm), but contrasting volumes of SAT and VAT. Volumes determined using 3D generation Orixi software.

Are the effect sizes for the associations of WC (or WHR) with cancer risk stronger than those for BMI and cancer risk? If true, this observation might favour a mechanism through insulin resistance. To address this, one needs to compare associations between equivalent standardized increments of fatness for each population. This is seldom reported.

Studies report associations of WC (or WHR) with cancer risk either (i) stratified into BMI categories, or (ii) adjusted for BMI, and conclude that associations of abdominal adiposity measures are ‘independent’ of those from BMI. This is in part attributed to the high correlations between these anthropometric measures and the greater measurement error in determining WC (or WHR) compared with BMI.

Few studies have formally tested the discrimination ability of BMI versus WC (or WHR) for cancer risk.

Earlier literature pointed out that fat distribution differs across ethnic groups with similar BMI values and suggested that measures of abdominal adiposity may more accurately predict metabolic-related disease risk. This dictum is now challenged for cardiovascular disease; there is a paucity of studies addressing this question for cancer risk.

BMI: body mass index. WC: Waist circumference. WHR: waist-hip-ratio.

*For this reason, the present authors avoid the term ‘central adiposity’ as it is potentially misleading.