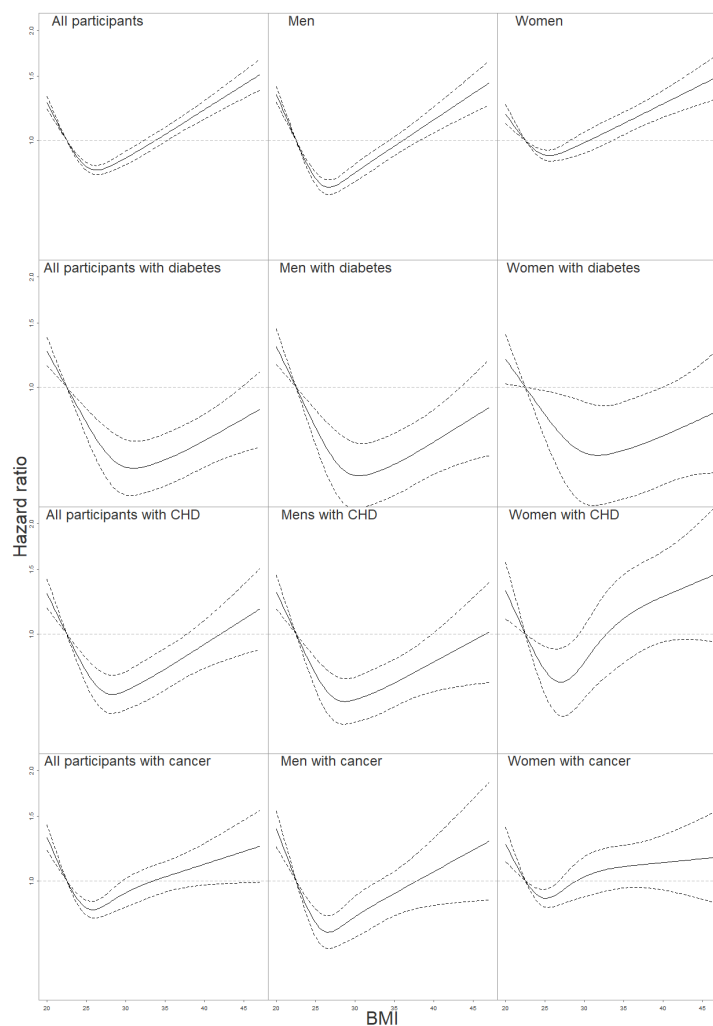SUPPLEMENTARY DATA

Supplementary Figure S1. – Adjusted hazard ratios (95% CI) for all-cause mortality associated with BMI by sex for the whole cohort and each subgroup separately

* Models are adjusted for, age, smoking status (current, past and never), ethnicity, education, deprivation index and chronic diseases diagnosed before study entry
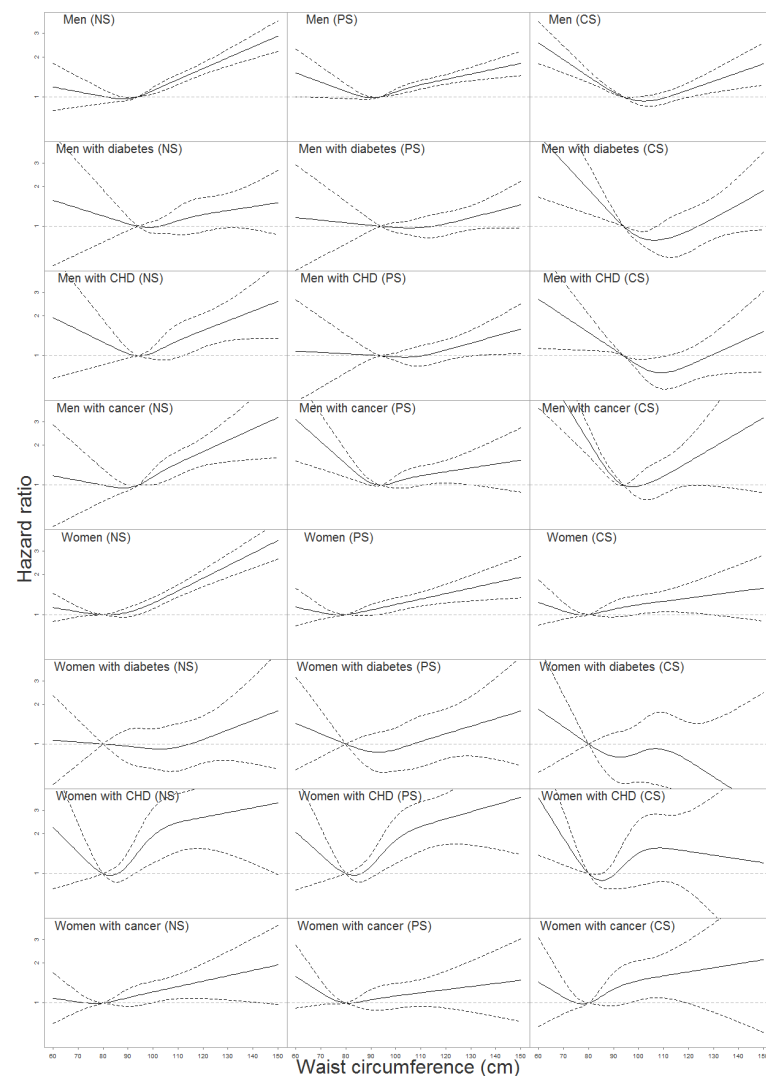
SUPPLEMENTARY DATA

Supplementary Table S1. – BMI, body fat and waist circumference values (95% CI) associated with the minimum all-cause mortality risk by gender and the presence of type 2 diabetes and CHD

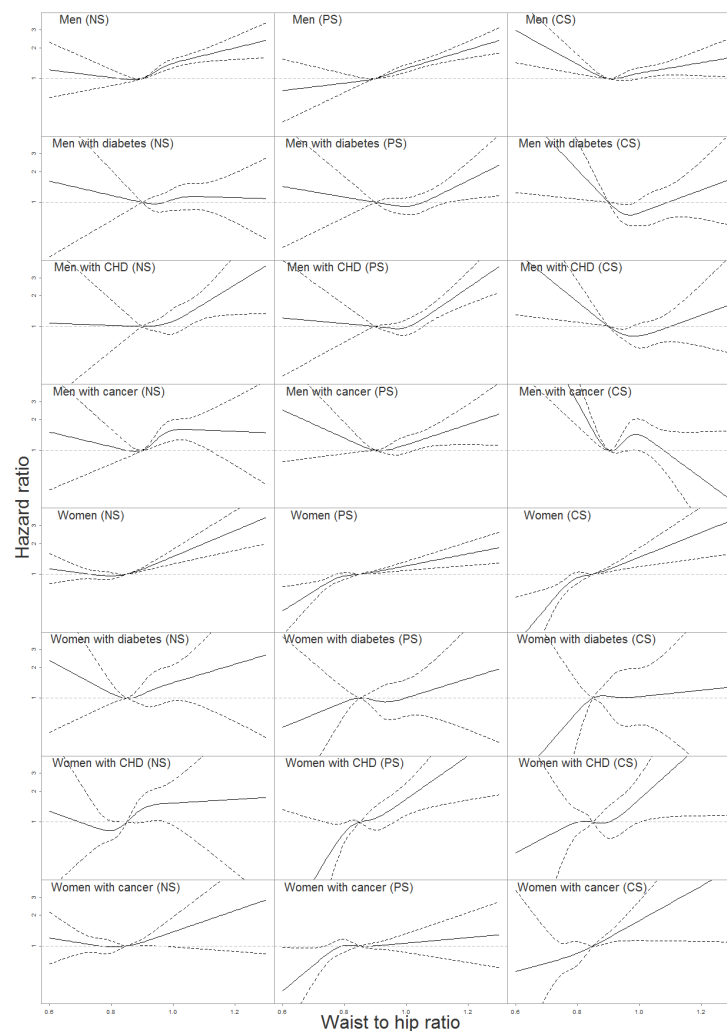| Population	BMI	% Body fat	Waist circumference
All participants	27.2 (26.6 - 27.7)	26.8 (20.7 – 29.4)	86.9 (83.8 – 88.8)
Participants with type 2 diabetes	33.4 (31.5 - 35.4)	35.6 (25.3 – 67.2)	102.9 (97.5 – 105.5)
Participants with CHD	30.1 (29.3 - 30.9)	30.3 (27.4 – 32.6)	96.0 (83.0 – 99.0)
Participants without type 2 diabetes	27.3 (26.9 - 27.7)	28.2 (20.9 – 30.2)	87.0 (84.1 – 88.7)
Participants with cancer	27.4 (25.8 - 30.3)	30.9 (22.7 – 36.8)	87.3 (81.0 – 90.6)
Women	27.3 (26.6 - 28.0)	36.0 (35.2 - 37.0)	81.1 (58.8 - 103.4)
Women with type 2 diabetes	34.1 (32.4 - 39.6)	44.3 (21.9 - 66.8)	99.1 (41.7 - 156.5)
Women with CHD	29.4 (19.0 - 39.8)	39.5 (33.9 - 45.3)	86.0 (55.1 - 117.0)
Women with cancer	26.3 (23.6 – 32.0)	37.0 (35.6 - 38.7)	80.9 (45.0 – 86.0)
Women without type 2 diabetes	27.2 (26.5 - 27.9)	36.0 (35.1 - 36.9)	81.6 (71.8 - 91.4)
Men	28.2 (27.8 - 28.5)	24.5 (23.9 - 25.1)	95.1 (93.7 - 96.5)
Men with type 2 diabetes	31.7 (30.8 - 32.6)	29.2 (25.5 - 32.9)	104.6 (91.3 - 118.0)
Men with CHD	29.9 (29.3 - 30.5)	27.7 (26.6 - 28.8)	101 (98.6 - 103.4)
Men without type 2 diabetes	28.1 (27.8 - 28.4)	24.5 (23.9 - 25.1)	95.0 (93.7 - 96.3)
Men with cancer	28.2 (25.6 - 31.9)	25.2 (23.6 - 26.1)	97.6 (95.5 - 99.2)

Supplementary Figure S2. - Adjusted hazard ratios (95% CI) for all-cause mortality associated with waist circumference by smoking status (never smokers = NS, previous smoker = PS and current smokers = CS) in men and women and by CHD, type 2 diabetes and cancer status at baseline with BMI 22.5 as referent

* Models are adjusted for, age, smoking status (current, past and never), ethnicity, education, deprivation index and chronic diseases diagnosed before study entry

SUPPLEMENTARY DATA

Supplementary Figure S3. - Adjusted hazard ratios (95% CI) for all-cause mortality associated with waist to hip ratio by smoking status (never smokers = NS, previous smoker = PS and current smokers = CS) in men and women and by CHD, type 2 diabetes and cancer status at baseline with BMI 22.5 as referent

* Models are adjusted for, age, smoking status (current, past and never), ethnicity, education, deprivation index and chronic diseases diagnosed before study entry
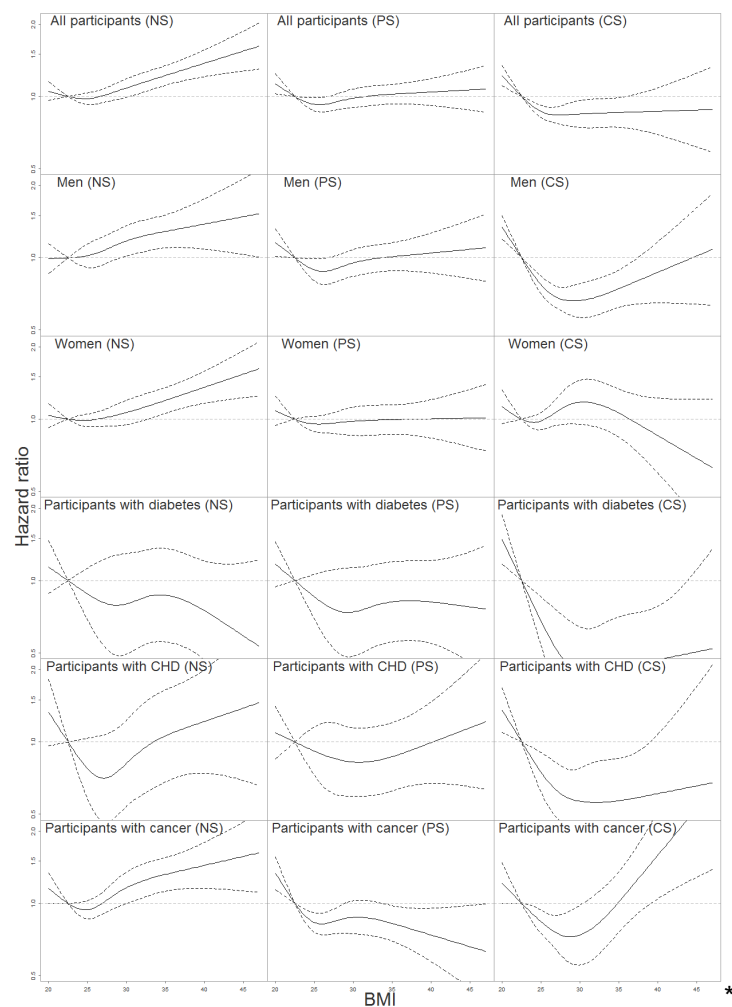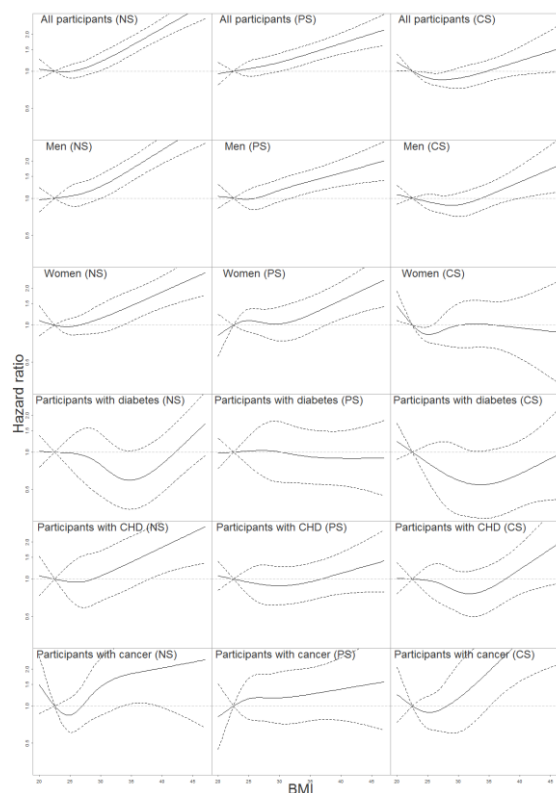
SUPPLEMENTARY DATA

Supplementary Figure S4. - Adjusted hazard ratios (95% CI) for cancer mortality associated with BMI by smoking status (never smokers = NS, previous smoker = PS and current smokers = CS) in men and women and by CHD, type 2 diabetes and cancer status at baseline with BMI 22.5 as referent

Models are adjusted for, age, smoking status (current, past and never), ethnicity, education, deprivation index and chronic diseases diagnosed before study entry
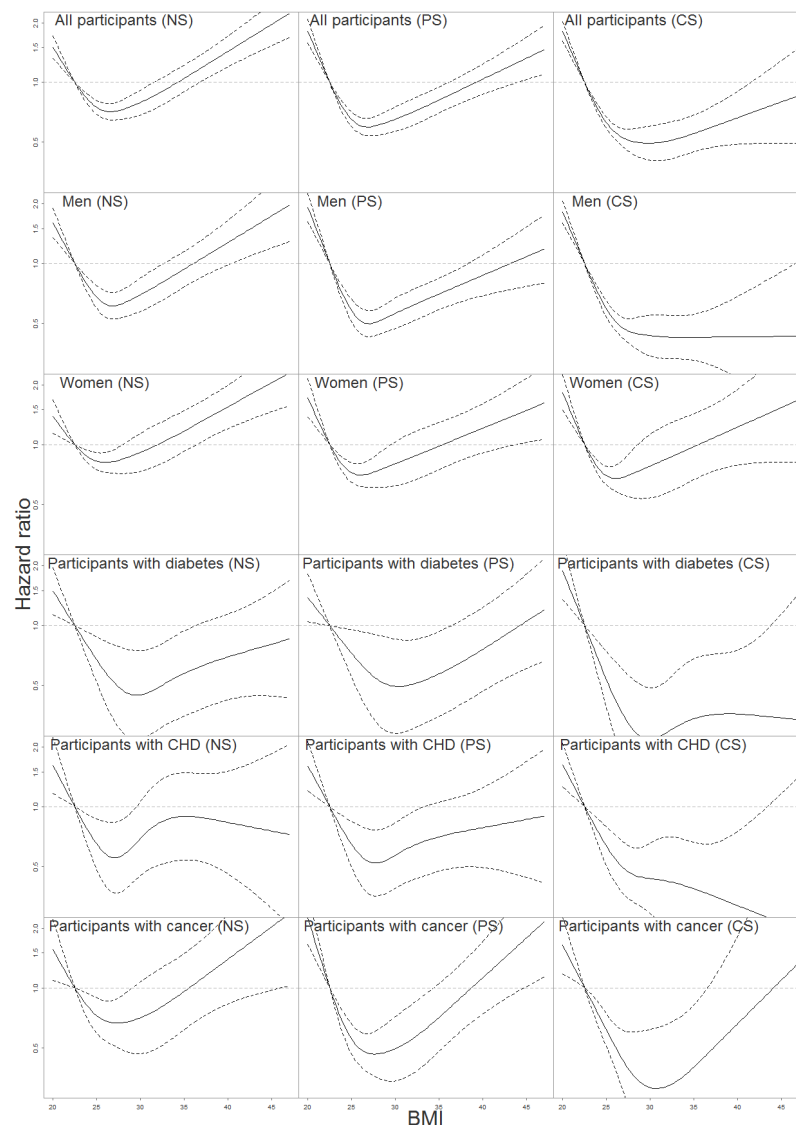
Supplementary Figure S5. - Adjusted hazard ratios (95% CI) for cardiovascular mortality associated with BMI by smoking status (never smokers = NS, previous smoker = PS and current smokers = CS) in men and women and by CHD, type 2 diabetes and cancer status at baseline with BMI 22.5 as referent

* Models are adjusted for, age, smoking status (current, past and never), ethnicity, education, deprivation index and chronic diseases diagnosed before study entry

Supplementary Figure S6. - Adjusted hazard ratios (95% CI) for "other" mortality associated with BMI by smoking status (never smokers = NS, previous smoker = PS and current smokers = CS) in men and women and by CHD, type 2 diabetes and cancer status at baseline with BMI 22.5 as referent

* Models are adjusted for, age, smoking status (current, past and never), ethnicity, education, deprivation index and chronic diseases diagnosed before study entry

SUPPLEMENTARY DATA

Supplementary Table S2. - Adjusted hazard ratios (95% CI) for all covariates adjusted for in the BMI and all-cause mortality models

Covariate	All participants	Women only	Men only	Participants with CHD	Participants with diabetes	Participants with cancer
Age at baseline	-0.07 (-0.08 , -0.06)	-0.08 (-0.09 , -0.07)	-0.06 (-0.07 , -0.05)	-0.07 (-0.09 , -0.04)	-0.11 (-0.13 , -0.08)	-0.02 (-0.03 , 0)
Deprivation score	0.04 (0.04 , 0.05)	0.03 (0.02 , 0.03)	0.05 (0.04 , 0.06)	0.05 (0.04 , 0.06)	0.04 (0.02 , 0.05)	0.03 (0.02 , 0.04)
Ethnicity						
White	-	-	-	-	-	-
South Asian	-0.26 (-0.43 , -0.09)	-0.56 (-0.93 , -0.2)	-0.16 (-0.35 , 0.03)	-0.15 (-0.48 , 0.17)	-0.33 (-0.59 , -0.06)	-0.16 (-0.64 , 0.32)
African Caribbean	-0.49 (-0.67 , -0.3)	-0.4 (-0.69 , -0.12)	-0.55 (-0.8 , -0.3)	-0.42 (-1.04 , 0.19)	-0.43 (-0.79 , -0.06)	0.21 (-0.13 , 0.56)
Mixed or other	-0.22 (-0.37 , -0.07)	0.05 (-0.15 , 0.26)	-0.46 (-0.67 , -0.24)	-0.84 (-1.35 , -0.32)	-0.41 (-0.75 , -0.06)	0.14 (-0.19 , 0.48)
Qualifications						
Degree or higher	-	-	-	-	-	-
A level	0.07 (0.01 , 0.14)	0.03 (-0.07 , 0.13)	0.1 (0.01 , 0.18)	0.02 (-0.2 , 0.23)	0.01 (-0.21 , 0.22)	0.12 (-0.02 , 0.25)
GCSE	0.1 (0.04 , 0.15)	0.01 (-0.07 , 0.09)	0.14 (0.07 , 0.21)	0.14 (-0.03 , 0.3)	0.05 (-0.11 , 0.22)	0.09 (-0.02 , 0.19)
CSE	0.13 (0.04 , 0.23)	0.05 (-0.1 , 0.19)	0.18 (0.06 , 0.31)	0.14 (-0.16 , 0.43)	-0.09 (-0.4 , 0.21)	-0.08 (-0.3 , 0.14)
NVQ	0.07 (0 , 0.14)	-0.02 (-0.16 , 0.12)	0.12 (0.04 , 0.21)	0.02 (-0.17 , 0.22)	-0.11 (-0.32 , 0.1)	0.04 (-0.11 , 0.2)
Other	0.08 (0 , 0.16)	0 (-0.12 , 0.12)	0.13 (0.02 , 0.23)	0.12 (-0.1 , 0.35)	-0.03 (-0.27 , 0.21)	0.01 (-0.16 , 0.18)
None	0.23 (0.18 , 0.28)	0.12 (0.05 , 0.2)	0.28 (0.22 , 0.35)	0.19 (0.05 , 0.34)	0.16 (0.01 , 0.3)	0.17 (0.06 , 0.27)
Prefer not to answer	0.2 (0.06 , 0.34)	0.2 (-0.03 , 0.42)	0.2 (0.02 , 0.38)	0.24 (-0.1 , 0.57)	0.39 (0.08 , 0.71)	0.18 (-0.11 , 0.48)
Comorbidities						
Hyperlipidaemia	-0.03 (-0.13 , 0.07)	0.03 (-0.16 , 0.21)	-0.05 (-0.16 , 0.06)	-0.11 (-0.25 , 0.04)	-0.1 (-0.27 , 0.08)	-0.16 (-0.38 , 0.06)
Renal failure	1.2 (1.11 , 1.24)	1.3 (1.15 , 1.38)	1.1 (1.06 , 1.21)	0.96 (0.83 , 1.08)	0.98 (0.84 , 1.11)	1.1 (1.01 , 1.27)
Liver failure	1.4 (1.22 , 1.69)	1.4 (0.98 , 1.76)	1.5 (1.19 , 1.77)	0.73 (-0.08 , 1.53)	1.4 (1 , 1.91)	0.67 (-0.21 , 1.55)
Heart failure	1.5 (1.41 , 1.52)	1.7 (1.61 , 1.82)	1.4 (1.31 , 1.44)	1.1 (1 , 1.21)	1.4 (1.22 , 1.48)	1.2 (1.06 , 1.32)