Supplemental Table 1. Mortality outcomes in the present analyses

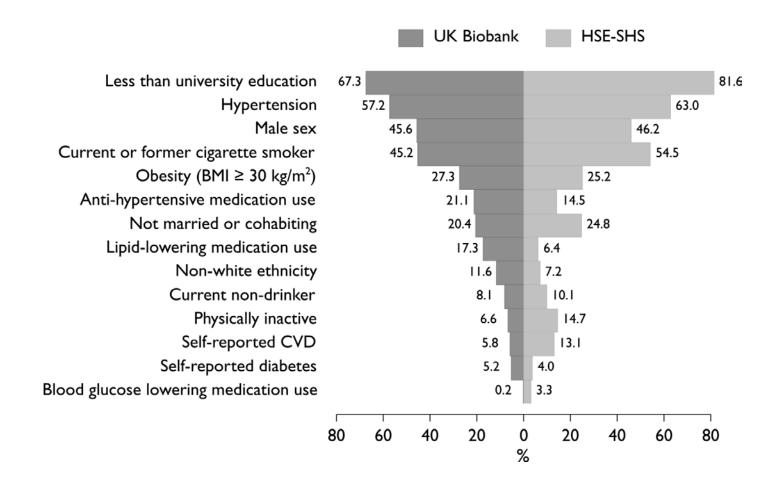
Mortality outcome	ICD 10 codes
All cancers combined	C00-C97
Obesity-attributable cancers ¹	Breast (postmenopausal) C50; Colon C18; Rectum C19-20;
	Pancreas C25; Endometrium C54; Kidney C64; Ovary C56
	& C57.0–4; Multiple myeloma C90; Liver C22; Thyroid
	C73; Gallbladder C23-24; Oesophageal adenocarcinoma
	C15 & morphology 8140–8141, 8143–8145, 8190–8231,
	8260–8263, 8310,8401, 8480–8490, 8550–8551, 8570–
	8574, 8576; and Gastric cardia C16.0
Smoking-attributable cancers ^{2,3}	Lip, oral cavity, pharynx C00–C14, oesophagus C15,
	stomach C16, colon and rectum C18–C20, liver C22,
	pancreas C25, larynx C32, trachea, lung, bronchus C33–
	C34, cervix uteri C53, kidney and renal pelvis C64–C65,
	urinary bladder C67, and acute myeloid leukemia C92.0
Cardiovascular disease	I20-5, I50, I60-70, I73, I74
Suicide ⁴	Suicide and self-inflicted poisoning by solid or liquid
	substances (E950-E959), injury undetermined whether
	accidentally or purposely inflicted (E980-E989), terrorism
	(U03.1 and U03.9), intentional self-harm (X60-X84), event
	of undetermined intent (Y10-Y34), sequelae of intentional
	self-harm, assault and events of undetermined intent (Y87),
	and sequelae of unspecified external cause (Y89.9))
Lung cancer	C34

Supplemental Table 2. Mortality rates in participants in UK Biobank and the HSE-SHS cohort studies

	UKBB	HSE-SHS
Number of adults (women)	502,655	89,895
Duration of mortality surveillance (years, mean [SD])	(273,472) 6.99 (1.03)	(48,364) 9.62 (4.39)
Total number of deaths	14,288	7,861
Mortality rate for cardiovascular disease	64	185
Mortality rate for all cancers combined	236	342
Mortality rate for tobacco-attributable cancers	120	198
Mortality rate for obesity-attributable cancers	94	132
Mortality rate for suicide	6	4

Mortality rates are expressed per 100,000 person-years. SD, standard deviation.

Supplemental Figure 1. Prevalence of baseline characteristics in UK Biobank and the HSE-SHS cohort studies



Selected comparisons have been made by Fry and others⁵ using published findings from four HSE studies (2006, 2008, 2009, and 2010). Our analyses are based on analyses of raw data from 18 cohort studies from England and Scotland which include two of those HSE studies (2006, 2008). Analyses comprise 502,655 people in UK Biobank and 89,895 in HSE-SHS. BMI, body mass index; CVD, cardiovascular disease.

Supplemental Figure 2. Association of selected baseline characteristics with cardiovascular disease mortality in UK Biobank and the HSE cohort studies – analyses based on the same baseline survey years (2006-8)

	N	Deaths			HR (95% CI)	RHR (95% CI)
Male sex						
UK Biobank (2006-08)	240895	1328		+	3.75 (3.31, 4.26)	1.11 (0.57, 2.16)
HSE (2006-08)	14828	47		─	3.38 (1.75, 6.51)	
Physically inactive						
UK Biobank (2006-08)	235633	1257		+	3.22 (2.78, 3.74)	1.45 (0.68, 3.07)
HSE (2006-08)	12012	37			2.23 (1.07, 4.65)	
Current non-drinker						
UK Biobank (2006-08)	240353	1321		+	1.82 (1.54, 2.14)	0.90 (0.39, 2.04)
HSE (2006-08)	14825	47		•	2.03 (0.90, 4.55)	
Not married/cohabiting						
UK Biobank (2006-08)	219830	1195		+	2.12 (1.88, 2.39)	0.87 (0.48, 1.59)
HSE (2006-08)	14827	47		-	2.43 (1.35, 4.37)	
Ever cigarette smoker						
UK Biobank (2006-08)	239677	1310		+	2.06 (1.83, 2.32)	0.94 (0.48, 1.84)
HSE (2006-08)	14816	47			2.20 (1.14, 4.27)	
Age (per 5 year increase)						
UK Biobank (2006-08)	240895	1328		•	1.68 (1.61, 1.75)	0.89 (0.71, 1.11)
HSE (2006-08)	14828	47		+	1.89 (1.52, 2.35)	
Less than university educ	cation					
UK Biobank (2006-08)	234291	1260		+	1.61 (1.40, 1.85)	0.17 (0.02, 1.22)
HSE (2006-08)	14826	47		\longrightarrow	9.67 (1.33, 70.35)	
Self-reported CVD						
UK Biobank (2006-08)	240078	1320		 →	5.02 (4.46, 5.64)	1.86 (1.02, 3.41)
HSE (2006-08)	14826	47			2.69 (1.49, 4.87)	
Obesity						
UK Biobank (2006-08)	239612	1305		•	1.70 (1.52, 1.90)	2.36 (1.15, 4.87)
HSE (2006-08)	13466	41	-	_	0.72 (0.35, 1.47)	
Elevated waist:hip ratio						
UK Biobank (2006-08)	240895	1328		+	1.97 (1.72, 2.25)	0.39 (0.12, 1.25)
HSE (2006-08)	11966	37		\longrightarrow	5.04 (1.59, 15.98)	
Self-reported diabetes						
UK Biobank (2006-08)	239932	1315		+	3.67 (3.22, 4.19)	1.60 (0.73, 3.49)
HSE (2006-08)	14826	47		-	2.29 (1.06, 4.95)	
Hypertension						
UK Biobank (2006-08)	235045	1267		+	1.92 (1.66, 2.22)	0.69 (0.28, 1.67)
HSE (2006-08)	9499	30		\longrightarrow	2.78 (1.16, 6.65)	
			.25	1 1 1 1 1 1 1 1 1 2 3 4 5		

Hazard ratios are age- and sex-adjusted with the exception of age and sex which are mutually adjusted. The shaded diamonds indicate the hazard ratio (HR) and error bars denote the 95% confidence interval (CI) for the relation of each characteristics with the risk of death outcome. The ratio of hazard ratio (RHR) summarises the difference (HSE-SHS is the referent group) between that effect estimates for the outcome. CVD, cardiovascular disease.

Supplemental Figure 3. Association of selected baseline characteristics with cardiovascular disease mortality in UK Biobank and the HSE cohort studies – analyses based on the same baseline survey years (2006-8) and censoring date (February 2011)

	N	Deaths		HR (95% CI)	RHR (95% CI)	P diff
Male sex						
UK Biobank (2006-08)	240895	403	→ >	4.05 (3.20, 5.13)	1.20 (0.60, 2.41)	0.611
HSE (2006-08)	14828	47	\longrightarrow	3.38 (1.75, 6.51)		
Physically inactive						
UK Biobank (2006-08)	235633	371	-	3.16 (2.41, 4.15)	1.42 (0.65, 3.12)	0.379
HSE (2006-08)	12012	37	-	2.23 (1.07, 4.65)		
Current non-drinker						
UK Biobank (2006-08)	240353	399	-	1.82 (1.35, 2.45)	0.90 (0.38, 2.12)	0.807
HSE (2006-08)	14825	47	-	2.03 (0.90, 4.55)		
Not married/cohabiting						
UK Biobank (2006-08)	219830	363	-	2.20 (1.77, 2.73)	0.90 (0.48, 1.69)	0.751
HSE (2006-08)	14827	47	-	2.43 (1.35, 4.37)		
Ever cigarette smoker						
UK Biobank (2006-08)	239677	395	-	2.32 (1.86, 2.90)	1.05 (0.52, 2.12)	0.885
HSE (2006-08)	14816	47		2.20 (1.14, 4.27)		
Age (per 5 year increase)						
UK Biobank (2006-08)	240895	403	•	1.69 (1.56, 1.83)	0.89 (0.71, 1.13)	0.348
HSE (2006-08)	14828	47	-	1.89 (1.52, 2.35)		
Less than university educ	cation					
UK Biobank (2006-08)	234291	372	-	1.83 (1.40, 2.38)	0.19 (0.03, 1.40)	0.103
HSE (2006-08)	14826	47	\longrightarrow	9.67 (1.33, 70.35)		
Self-reported CVD						
UK Biobank (2006-08)	240078	399	\rightarrow	5.20 (4.21, 6.43)	1.93 (1.03, 3.62)	0.040
HSE (2006-08)	14826	47	-	2.69 (1.49, 4.87)		
Obesity						
UK Biobank (2006-08)	239612	393	-	1.55 (1.27, 1.90)	2.16 (1.03, 4.53)	0.042
HSE (2006-08)	13466	41 —	+	0.72 (0.35, 1.47)		
Elevated waist:hip ratio						
UK Biobank (2006-08)	240895	403	-	2.11 (1.64, 2.72)	0.42 (0.13, 1.37)	0.150
HSE (2006-08)	11966	37	\longrightarrow	5.04 (1.59, 15.98)		
Self-reported diabetes						
UK Biobank (2006-08)	239932	395	-	3.25 (2.55, 4.14)	1.42 (0.63, 3.17)	0.397
HSE (2006-08)	14826	47	-	2.29 (1.06, 4.95)		
Hypertension						
UK Biobank (2006-08)	235045	377	-	1.62 (1.25, 2.09)	0.58 (0.23, 1.45)	0.244
HSE (2006-08)	9499	30	$ \longrightarrow$	2.78 (1.16, 6.65)		
		.25	1 2 3 4 5			

Hazard ratios are age- and sex-adjusted with the exception of age and sex which are mutually adjusted. The shaded diamonds indicate the hazard ratio (HR) and error bars denote the 95% confidence interval (CI) for the relation of each characteristics with the risk of death outcome. The ratio of hazard ratio (RHR) summarises the difference (HSE-SHS is the referent group) between that effect estimates for the outcome. CVD, cardiovascular disease.

Supplemental Figure 4. Association of baseline demographic and behavioural characteristics with cardiovascular disease mortality in UK Biobank and the HSE-SHS cohort studies – stratification by gender

			Men						Women		
	N	Deaths		HR (95% CI)	RHR (95% CI)		N	Deaths		HR (95% CI)	RHR (95% CI)
Physically in	active					Physically in	active				
UK Biobank	225912	1655	+	3.40 (2.99, 3.88)	1.52 (1.15, 2.00)	UK Biobank	269585	507	-	3.34 (2.69, 4.15)	1.42 (1.07, 1.87)
HSE-SHS	30648	340	-	2.24 (1.76, 2.86)		HSE-SHS	26055	593	+	2.36 (1.99, 2.80)	
Current non	n-drinker					Current nor	n-drinker				
UK Biobank	228421	1716	+	1.81 (1.55, 2.11)	1.03 (0.80, 1.32)	UK Biobank	272731	524	-	2.21 (1.79, 2.73)	1.55 (1.16, 2.08)
HSE-SHS	48332	563	-	1.76 (1.44, 2.15)		HSE-SHS	41513	1029	-	1.42 (1.16, 1.74)	
Not married	d/cohabitin	g				Not marrie	d/cohabitin	g			
UK Biobank	213476	1573	•	2.43 (2.19, 2.70)	1.37 (1.13, 1.67)	UK Biobank	242121	465	-	1.61 (1.33, 1.95)	0.82 (0.65, 1.04)
HSE-SHS	48333	563	+	1.77 (1.50, 2.09)		HSE-SHS	41504	1025	•	1.96 (1.72, 2.24)	
Ever cigaret	te smoker					Ever cigaret	te smoker				
UK Biobank	227749	1704	+	2.06 (1.85, 2.29)	1.03 (0.84, 1.27)	UK Biobank	271952	520	-	2.06 (1.73, 2.45)	1.02 (0.81, 1.28)
HSE-SHS	48319	564	+	1.99 (1.67, 2.36)		HSE-SHS	41447	1028	+	2.02 (1.74, 2.35)	
Age (per 5 ye	ear increase))				Age (per 5 ye	ear increase)				
UK Biobank	229183	1724	•	1.60 (1.54, 1.66)	0.83 (0.77, 0.89)	UK Biobank	273472	527	•	1.83 (1.70, 1.97)	1.04 (0.96, 1.13)
HSE-SHS	48364	566	•	1.93 (1.81, 2.05)		HSE-SHS	41531	1030	•	1.76 (1.68, 1.83)	
Less than un	niversity ed	lucation				Less than u	niversity ed	lucation			
UK Biobank	224391	1659	•	1.54 (1.37, 1.72)	0.73 (0.50, 1.08)	UK Biobank	268122	508	-	1.82 (1.44, 2.32)	0.98 (0.71, 1.36)
HSE-SHS	48337	565	-	2.09 (1.45, 3.01)		HSE-SHS	41507	1028	-	1.86 (1.49, 2.32)	
		.25	1 2 3 4					.25	1 2 3 4		

Hazard ratios are age- and sex-adjusted. The shaded diamonds indicate the hazard ratio (HR) and error bars denote the 95% confidence interval (CI) for the relation of each characteristics with the risk of death outcome. The ratio of hazard ratio (RHR) summarises the difference (HSE-SHS is the referent group) between that effect estimates for the outcome.

Supplemental Figure 5. Association of baseline biomedical characteristics with cardiovascular disease mortality in UK Biobank and the HSE-SHS cohort studies – stratification by gender

]	Men		
	N	Deaths			HR (95% CI)	RHR (95% CI)
HbAlc (per d	loubling in	nmol/mol)				
UK Biobank	198688	1191		-	- 3.94 (3.20, 4.85)	1.01 (0.49, 2.09)
HSE-SHS	11200	78		_	→ 3.90 (I.94, 7.82)	
Self-reported	CVD					
UK Biobank	228109	1714			4.90 (4.43, 5.42)	1.93 (1.57, 2.37)
HSE-SHS	48352	566		+	2.54 (2.12, 3.03)	
Obesity						
UK Biobank	227562	1689		•	1.76 (1.60, 1.94)	1.32 (1.07, 1.63)
HSE-SHS	44206	500		+	1.33 (1.10, 1.60)	
Elevated wai	st:hip rati	0				
UK Biobank	229183	1724		+	1.89 (1.66, 2.15)	1.12 (0.82, 1.54)
HSE-SHS	30317	298		-	1.68 (1.26, 2.24)	
Self-reported	d diabatar					
UK Biobank	227770	1710			3.55 (3.18, 3.97)	0.71 (0.54, 0.92)
HSE-SHS	48352	566		1	→ 5.02 (3.97, 6.36)	0.71 (0.31, 0.72)
FEVI (per 0.5						
UK Biobank	205164	1345	•		0.70 (0.68, 0.73)	1.23 (1.08, 1.41)
HSE-SHS	14171	212	+		0.57 (0.50, 0.64)	
Total cholest	erol (per	mmol/L inc	rease)			
UK Biobank	165632	767		+	0.99 (0.92, 1.06)	0.91 (0.78, 1.05)
HSE-SHS	16680	165		•	1.09 (0.96, 1.25)	
C-reactive pr	rotein (per	doubling in	mg/L)			
UK Biobank	206473	1419	0 /	•	1.34 (1.29, 1.40)	1.03 (0.85, 1.25)
HSE-SHS	10261	68		-	1.30 (1.07, 1.57)	
HDL-cholest	oral (par a	oubling in n	amal/L)			
UK Biobank	152947	719			0.58 (0.47, 0.72)	1.33 (0.82, 2.17)
HSE-SHS	14071	107	<u> </u>		0.43 (0.28, 0.67)	1.55 (0.02, 2.17)
Hypertension		1.454		١.	1.00 (1.45.0.15)	0.44.047.000
UK Biobank HSE-SHS	224588 30881	1656 345		*	1.89 (1.65, 2.15) 2.95 (2.26, 3.86)	0.64 (0.47, 0.86)
H3E-3H3	30001	343			2.73 (2.26, 3.86)	
				 		
			25	1 2 3 4	5	

Hazard ratios are age- and sex-adjusted. The shaded diamonds indicate the hazard ratio (HR) and error bars denote the 95% confidence interval (CI) for the relation of each characteristics with the risk of death outcome. The ratio of hazard ratio (RHR) summarises the difference (HSE-SHS is the referent group) between that effect estimates for the outcome. HbA1c, glycosylated haemoglobin; FEV1, forced expiratory volume in one second; and HDL, high-density lipoprotein.

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