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Supplementary appendix

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The Global BMI Mortality Collaboration: Body-mass index and all-cause mortality Individual-participant-data meta-analysis of 239 cohorts across four continents

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Note: WHO defines **6** BMI groups (underweight, normal, overweight and grades I, II and III obesity). But, finer subdivision of the WHO normal and overweight groups yields the **9** finer groups used here.

Supplementary Tables

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eTable 1: Baseline characteristics of participating studies

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Europe																			
Vorarlberg Health Monitoring and Promotion Programme	1	Austria	Health check-up	measured	120981	25.4 (4.2)	47.9 (13.6)	70.0 (8.0)	55291 (46)	22621 (19)	1988	13.2 (8.9, 15.6)	+	7126	3338	1706	796	2387	297
Belgian Inter-university Research on Nutrition and Health	2	Belgium	Electoral roll	measured	11053	26.0 (4.1)	48.8 (13.3)	68.0 (10.0)	5820 (53)	3672 (33)	1982	10.5 (10.5, 10.5)	++	1051	422	164	82	326	54
Flemish Study on Environment, Genes and Health (FLEMENGHO)	3	Belgium	General popln.	measured	1342	25.7 (4.3)	47.9 (15.9)	73.0 (12.0)	656 (49)	490 (37)	1987	7.5 (6.5, 9.5)	+	112	50	14	14	38	8
Seven Countries Croatia	4	Croatia	General popln.	measured	1349	23.1 (3.3)	50.3 (5.1)	67.0 (8.0)	1349 (100)	792 (59)	1958	23.5 (14.5, 24.5)	+	744	324	96	138	143	116
Copenhagen City Heart Study	5	Denmark	Popln. register	measured	14166	25.2 (4.2)	52.6 (12.0)	70.0 (10.0)	6485 (46)	8374 (59)	1976	16.5 (14.5, 17.5)	++	4719	1084	658	184	934	150
Research Centre for Prevention and Health (Glostrup Population Studies)	6	Denmark	Popln. register	measured	10135	24.9 (4.0)	48.4 (13.6)	69.0 (13.0)	5076 (50)	5244 (52)	1983	10.5 (5.5, 10.5)	++	1070	446	268	76	351	59
Finnish Mobile Clinic Survey	7	Finland	General popln.	measured	44798	25.3 (4.0)	42.1 (15.0)	70.0 (13.0)	24034 (54)	14928 (33)	1970	22.5 (20.5, 23.5)	+	12183	6792	4167	1475	2636	221
Finrisk Cohort 1977	8	Finland	Popln. register	measured	12080	26.1(4.2)	43.7(10.9)	62.0 (10.0)	5919 (49)	3624 (30)	1977	17.0 (17.0, 17.0)	++	1889	1049	725	201	427	75
Finrisk Cohort 1982	8	Finland	Popln. register	measured	9340	26.1(4.3)	43.9(11.3)	60.0 (9.0)	4577 (49)	2895 (31)	1982	12.0 (12.0, 12.0)	++	825	400	283	64	249	23
Finrisk Cohort 1987	8	Finland	Popln. register	measured	6232	26.5(4.4)	44.3(11.3)	58.0 (9.0)	2991 (48)	1745 (28)	1987	7.0 (7.0, 7.0)	++	249	134	97	20	56	5
Finrisk Cohort 1992	8	Finland	Popln. register	measured	6011	26.3 (4.5)	44.9 (11.4)	62.0 (8.0)	2837 (47)	1841 (31)	1992	16.9 (16.8, 16.9)	++	376	139	81	23	104	31
Finrisk Cohort 1997	8	Finland	Popln. register	measured	7653	26.8 (4.5)	49.8 (12.3)	68.0 (9.0)	3849 (50)	1976 (26)	1997	11.8 (11.8, 11.9)	++	340	131	71	13	90	50
Helsinki Aging Study	9	Finland	Popln. register	measured	501	25.4 (4.2)	78.8 (4.1)	85.0 (5.0)	131 (26)	37 (8)	1989	9.1 (4.7, 11.0)	++	276	130	59	44	43	56
Helsinki Businessmen Study	10	Finland	Health check-up	measured	1367	26.0 (3.0)	59.8 (4.1)	76.0 (7.0)	1367 (100)	236 (17)	1986	24.5 (18.0, 24.5)	+	579	150	100	32	166	0
Kuopio Ischaemic Heart Disease Study	11	Finland	Popln. register	measured	2655	26.9 (3.6)	53.1 (5.2)	67.0 (7.0)	2655 (100)	848 (32)	1986	21.6 (18.1, 23.6)	++	883	417	292	68	236	29
North Karelia Project	12	Finland	Popln. register	measured	11157	25.9 (4.1)	40.8 (9.9)	61(10)	5453 (49)	3927 (35)	1972	22.0 (22.0, 22.0)	++	2188	1171	811	203	510	77
Seven Countries Finland	4	Finland	General popln.	measured	1633	23.7 (3.2)	49.3 (5.6)	65.0 (8.0)	1633 (100)	1022 (63)	1959	23.5 (14.5, 25.5)	+	888	515	360	79	208	59
Centre d'Investigations Preventives et Cliniques (IPC), Paris	13	France	Health check-up	measured	220101	23.7 (3.5)	40.7 (11.7)	61.0 (14.0)	124983 (57)	65381 (30)	1982	11.5 (9.5, 14.5)	++	7170	1461	633	356	3057	200
Data from an Epidemiological Study on the Insulin Resistance Syndrome	14	France	Health check-up	measured	5107	24.7 (3.8)	47.4 (10.0)	64.0 (9.0)	2525 (49)	1127 (22)	1995	14.4 (14.1, 14.7)	+	199	33	13	10	100	3
Paris Prospective Study I	15	France	Occupational	measured	7594	25.9 (3.3)	47.2 (2.0)	62.0 (7.0)	7594 (100)	5610 (74)	1969	22.5 (21.5, 24.5)	++	2177	620	203	105	917	47
Prospective Epidemiological Study of Myocardial Infarction	16	France / NI	General popln.	measured	10598	26.6 (3.5)	54.9 (2.9)	59.0 (3.0)	10598 (100)	2846 (27)	1992	5.2 (5.1, 6.1)	++	242	65	31	9	116	5
Epidemiologische Studie zu Chancen der Verhütung	17	Germany	Health check-up	measured	9596	27.7 (4.3)	62.1 (6.6)	68.0 (6.0)	4324 (45)	1562 (17)	2001	5.1 (4.9, 5.2)	+	495	162	85	35	220	15
Göttingen Risk Incidence and Prevalence Study	18	Germany	Occupational	measured	5996	26.3 (3.0)	47.9 (5.1)	56.0 (6.0)	5996 (100)	2238 (37)	1982	9.8 (9.7, 9.9)	++	352	163	86	23	111	6
MONICA/KORA Augsburg Survey 1	19	Germany	Popln. register	measured	918	27.6 (3.3)	54.2 (5.8)	65.0 (7.0)	918 (100)	307 (33)	1985	13.0 (12.8, 13.2)	++	175	89	52	8	53	13
MONICA/KORA Augsburg Survey 2	19	Germany	Popln. register	measured	4134	27.1 (4.2)	53.3 (11.8)	68.0 (8.0)	2076 (50)	1001 (24)	1990	7.9 (7.7, 8.1)	++	328	145	93	22	105	22
MONICA/KORA Augsburg Survey 3	19	Germany	Popln. register	measured	4689	27.1 (4.5)	50.4 (13.7)	72.0 (10.0)	2316 (49)	1171 (25)	1995	14.0 (13.3, 14.3)	++	666	265	119	64	220	52
Prospective Cardiovascular Münster Study	20	Germany	Occupational	measured	20391	25.6 (3.5)	43.9 (9.7)	62.0 (9.0)	14804 (73)	7937 (39)	1983	10.0 (7.2, 17.8)	++	1069	350	151	36	453	57
Study of Health in Pomerania	21	Germany	Popln. register	measured	3760	27.7 (4.7)	53.4 (14.2)	75.0 (10.0)	1856 (49)	1090 (29)	1999	11.3 (10.6, 11.8)	++	555	189	82	51	200	36
Württemberg Construction Workers Cohort	22	Germany	Occupational	measured	21171	26.5 (3.6)	42.8 (10.8)	61.0 (6.0)	21171 (100)	9432 (53)	1989	17.0 (15.0, 18.6)	+	2335	553	309	65	859	124
ATTICA Study	23	Greece	General popln.	measured	1531	27.0 (4.4)	51.2 (10.9)	72.0 (13.0)	784 (51)	603 (39)	2001	5.0 (5.0, 5.0)	+	50	30	0	0	13	0
Seven Countries Greece	4	Greece	General popln.	measured	1203	23.1 (3.3)	49.3 (5.6)	68.0 (8.0)	1203 (100)	720 (60)	1960	24.5 (21.5, 24.5)	+	421	182	45	84	111	37

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Reykjavik Study	24	Iceland	Popln. register	measured	18787	25.5 (3.9)	52.8 (8.8)	76.0 (10.0)	9091 (48)	8874 (47)	1975	25.9 (18.7, 33.2)	++	10412	4669	2799	1024	3165	876
Bezafibrate Infarction Prevention Registry Study	25	Israel	GP list	measured	6355	26.7 (3.4)	60.1 (7.0)	67.0 (7.0)	5625 (89)	730 (11)	1991	3.4 (0.2, 7.5)	++	938	422	313	29	130	13
Israeli Ischaemic Heart Disease Study	26	Israel	Occupational	measured	10033	25.6 (3.3)	49.3 (6.9)	68.0 (9.0)	10033 (100)	5061 (50)	1963	23.5 (19.5, 23.5)	++	3465	1692	1025	362	707	149
Glucose Intolerance, Obesity and Hypertension Study	27	Israel	Popln. register	measured	5561	25.2 (4.2)	43.5 (8.5)	70.0 (10.0)	2699 (49)	1735 (31)	1970	29.0 (25.9, 36.0)	++	1945	595	278	134	335	74
Bruneck Study	28	Italy	Popln. register	measured	919	24.9 (3.8)	58.9 (11.5)	78.0 (10.0)	467 (51)	224 (24)	1990	20.2 (13.7, 20.5)	++	347	136	65	39	101	51
Cardiovascular Study in the Elderly	29	Italy	Popln. register	measured	3195	26.4 (4.3)	73.6 (5.1)	82.0 (6.0)	1257 (39)	416 (13)	1984	11.1 (6.8, 12.7)	++	1560	808	149	162	352	57
Occupational Groups (OG), Rome	30	Italy	Occupational	measured	3344	26.5 (3.3)	55.2 (5.3)	64.0 (6.0)	3344 (100)	1674 (50)	1980	10.5 (9.5, 10.5)	+	400	164	126	30	170	8
Progetto CUORE (ATENA)	31	Italy	Electoral roll	measured	4957	27.2 (4.4)	50.0 (7.4)	59.0 (9.0)	0 (0)	1977 (40)	1995	6.8 (6.0, 7.5)	++	45	12	2	2	22	0
Progetto CUORE (EMOFRI)	31	Italy	Electoral roll	measured	400	26.6 (4.1)	54.7 (5.7)	59.0 (8.0)	200 (50)	106 (27)	1996	6.7 (6.6, 7.0)	++	13	8	0	3	2	0
Progetto CUORE (MATISS83)	31	Italy	Electoral roll	measured	2678	28.2 (4.5)	51.8 (9.6)	70.0 (9.0)	1260 (47)	785 (29)	1984	18.7 (18.5, 18.9)	++	539	285	50	34	97	15
Progetto CUORE (MATISS87)	31	Italy	Electoral roll	measured	2208	28.7 (4.5)	52.6 (9.5)	68.0 (8.0)	982 (44)	471 (22)	1987	15.6 (15.2, 15.9)	++	286	146	32	11	48	7
Progetto CUORE (MATISS93)	31	Italy	Electoral roll	measured	1310	28.2 (4.6)	49.8 (9.3)	62.0 (8.0)	631 (48)	341 (26)	1994	8.3 (7.8, 9.2)	++	47	23	6	3	7	0
Progetto CUORE (MONFRI86)	31	Italy	Electoral roll	measured	1441	26.6 (4.1)	49.3 (8.7)	65.0 (8.0)	711 (49)	459 (32)	1986	16.7 (16.6, 16.8)	++	194	79	10	2	42	3
Progetto CUORE (MONFRI89)	31	Italy	Electoral roll	measured	1388	26.5 (4.3)	48.7 (8.3)	62.0 (9.0)	691 (50)	392 (28)	1989	13.6 (13.5, 13.6)	++	116	52	6	5	17	8
Progetto CUORE (MONFRI94)	31	Italy	Electoral roll	measured	1370	26.4 (4.3)	49.1 (8.1)	59.0 (6.0)	680 (50)	365 (27)	1994	8.5 (8.3, 8.6)	++	57	22	0	5	7	1
Risk Factors and Life Expectancy Pooling Project (ATS_SAR)	32	Italy	Electoral roll	measured	4343	26.7 (4.5)	46.3 (7.8)	58.0 (6.0)	2100 (48)	1220 (32)	1983	8.7 (7.7, 8.7)	+	128	38	23	8	57	6
Risk Factors and Life Expectancy Pooling Project (DISCO)	32	Italy	Electoral roll	measured	2062	28.2 (4.6)	50.6 (11.2)	66.0 (7.0)	911 (44)	539 (28)	1987	5.5 (5.5, 8.5)	+	36	17	12	5	12	0
Risk Factors and Life Expectancy Pooling Project (GREPCO)	32	Italy	Electoral roll	measured	796	24.6 (3.9)	43.9 (8.3)	52.0 (9.0)	0 (0)	319 (41)	1980	7.9 (7.8, 8.1)	+	5	0	0	0	4	0
Risk Factors and Life Expectancy Pooling Project (GUBBIO)	32	Italy	Electoral roll	measured	3408	27.1 (4.2)	55.0 (13.2)	73.0 (10.0)	1515 (44)	1161 (34)	1984	8.4 (7.4, 9.4)	+	239	107	69	29	95	9
Risk Factors and Life Expectancy Pooling Project (MICOL)	32	Italy	Electoral roll	measured	19911	26.4 (4.0)	50.8 (9.7)	62.0 (8.0)	11244 (56)	6271 (32)	1986	5.9 (5.5, 6.8)	+	561	180	133	35	256	18
Risk Factors and Life Expectancy Pooling Project (MONICA)	32	Italy	Electoral roll	measured	3661	26.5 (4.2)	49.3 (9.0)	59.0 (8.0)	1830 (50)	1242 (34)	1986	6.5 (2.3, 8.5)	+	100	38	28	8	45	4
Risk Factors and Life Expectancy Pooling Project (NFR)	32	Italy	Electoral roll	measured	3339	26.5 (3.3)	55.2 (5.3)	64.0 (6.0)	3339 (100)	1672 (50)	1980	10.2 (9.8, 10.4)	+	400	163	126	29	171	7
Risk Factors and Life Expectancy Pooling Project (OB43)	32	Italy	Electoral roll	measured	3704	26.6 (4.4)	47.0 (7.8)	57.0 (6.0)	1793 (48)	1290 (36)	1984	7.5 (5.4, 8.1)	+	81	28	19	8	36	4
Risk Factors and Life Expectancy Pooling Project (RF2)	32	Italy	Electoral roll	measured	5538	26.1 (4.3)	44.2 (9.3)	59.0 (7.0)	2603 (47)	2006 (36)	1978	13.7 (12.8, 13.8)	+	340	105	76	21	151	8
Seven Countries Italy	4	Italy	Occupational	measured	2460	25.6 (3.8)	48.7 (5.2)	66.0 (8.0)	2460 (100)	1531 (62)	1959	24.5 (16.5, 24.5)	+	1081	481	220	135	334	67
Vicenza Thrombophilia and Athrosclerosis Project	33	Italy	Census list	measured	9366	25.3 (4.0)	51.4 (8.2)	73.0 (12.0)	4277 (46)	2452 (26)	1995	3.3 (2.3, 4.4)	++	106	31	14	5	52	3
Consultation Bureau Project	34	Netherlands	General popln.	measured	48891	24.6 (3.4)	38.8 (4.3)	50.0 (6.0)	23330 (48)	25407 (52)	1977	12.5 (10.5, 13.5)	+	1288	393	232	72	556	25
Hoorn Study	35	Netherlands	Popln. register	measured	2462	26.5 (3.6)	61.7 (7.3)	74.0 (8.0)	1130 (46)	767 (31)	1991	13.6 (11.4, 14.1)	+	610	229	36	40	173	33
Longitudinal Aging Study Amsterdam	36	Netherlands	Popln. register	measured	2607	26.8 (4.1)	70.4 (8.7)	81.0 (7.0)	1277 (49)	657 (25)	1993	9.8 (6.8, 10.2)	+	976	0	0	0	0	0
Monitoring of CVD Risk Factors Project	37	Netherlands	General popln.	measured	24831	25.2 (4.0)	42.4 (10.3)	62.0 (8.0)	11640 (47)	10920 (44)	1989	16.7 (15.4, 18.0)	+	2099	594	272	113	952	116
Prevention of Renal and Vascular End Stage Disease Study	38	Netherlands	General popln.	measured	8488	26.1 (4.2)	49.3 (12.7)	71.0 (10.0)	4248 (50)	2901 (34)	1998	12.7 (12.4, 12.9)	++	833	239	104	44	387	47

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Seven Countries Netherlands	4	Netherlands	General popln.	measured	876	24.0 (2.7)	49.4 (5.5)	67.0 (8.0)	876 (100)	652 (74)	1959	24.5 (17.5, 24.5)	+	425	221	153	31	155	20
The Rotterdam Study	39	Netherlands	Popln. register	measured	6315	26.3 (3.7)	68.7 (8.4)	81.0 (8.0)	2610 (41)	1162 (20)	1992	11.9 (8.9, 12.9)	++	2423	937	146	245	653	146
The Rotterdam Study II	39	Netherlands	Popln. register	measured	2659	27.2 (4.1)	64.6 (7.7)	77.0 (9.0)	1200 (45)	608 (23)	2000	10.0 (9.2, 10.5)	++	440	145	19	40	161	31
The Rotterdam Study III	39	Netherlands	Popln. register	measured	3566	27.8 (4.6)	56.9 (6.8)	65.0 (10.0)	1544 (43)	960 (27)	2007	3.6 (2.8, 4.2)	++	63	20	2	4	34	3
Cohort of Norway (FINNMARK)	40	Norway	Popln. register	measured	6231	27.7 (4.5)	59.9 (9.9)	72.0 (8.0)	2971 (48)	2243 (36)	2002	7.5 (7.5, 7.5)	+	514	182	90	46	182	42
Cohort of Norway (HUBRO)	40	Norway	Popln. register	measured	16796	25.7 (4.1)	52.0 (14.1)	75.0 (10.0)	7484 (45)	4661 (28)	2001	8.5 (8.5, 9.5)	+	1178	333	130	99	463	88
Cohort of Norway (OPPHED)	40	Norway	Popln. register	measured	10239	26.9 (4.2)	53.1 (12.7)	74.0 (11.0)	4739 (46)	3132 (31)	2001	8.5 (8.5, 8.5)	+	763	251	111	69	281	66
Cohort of Norway (OSLO2)	40	Norway	General popln.	measured	6383	26.4 (3.4)	69.2 (6.3)	77.0 (5.0)	6383 (100)	1355 (21)	2000	9.5 (9.5, 9.5)	+	1540	484	217	114	612	125
Cohort of Norway (TROMS)	40	Norway	Popln. register	measured	2133	27.3 (4.2)	52.1 (12.4)	67.0 (7.0)	950 (45)	725 (34)	2002	7.5 (7.5, 7.5)	+	95	38	23	4	40	4
Norwegian Counties Study (NCS1)	41	Norway	Popln. register	measured	24630	24.9 (3.5)	42.4 (4.3)	54.0 (6.0)	12194 (50)	10650 (43)	1976	16.1 (15.7, 16.4)	+	1519	604	423	70	566	50
Norwegian Counties Study (NCS2)	41	Norway	Popln. register	measured	13306	24.7 (3.4)	42.3 (4.4)	55.0 (6.0)	6819 (51)	5167 (39)	1975	17.2 (17.0, 17.6)	+	859	319	221	34	334	22
Norwegian Counties Study (NCS3)	41	Norway	Popln. register	measured	10345	25.2 (3.8)	42.2 (4.4)	55.0 (6.0)	5411 (52)	5681 (56)	1974	18.1 (18.0, 18.4)	+	1092	547	347	94	295	34
Oslo Study	42	Norway	Popln. register	measured	17786	24.6 (2.9)	43.9 (5.6)	66.0 (8.0)	17786 (100)	9937 (56)	1973	29.5 (25.1, 30.0)	+	6203	2819	1772	393	2076	346
Tromsø Study	43	Norway	Household listings	measured	26120	24.4 (3.7)	42.9 (15.6)	74.0 (10.0)	12400 (47)	10607 (48)	1987	21.9 (13.9, 22.2)	+	3461	1280	584	287	993	254
Edinburgh Artery Study	44	Scotland	GP list	measured	1591	25.6 (3.9)	64.9 (5.7)	78.0 (7.0)	808 (51)	403 (25)	1988	18.2 (10.5, 20.8)	++	916	350	184	96	274	106
Prospective Study of Pravastatin in the Elderly at Risk	45	Scotland/Ireland/ Netherland	Health check-up	measured	5802	26.8 (4.2)	75.3 (3.3)	78.0 (4.0)	2804 (48)	1557 (27)	1998	3.3 (3.0, 3.5)	++	604	292	216	36	206	0
Seven Countries Serbia	4	Serbia	Occupational	measured	1562	24.5 (3.6)	48.4 (5.9)	66.0 (8.0)	1562 (100)	804 (51)	1963	24.5 (17.5, 25.5)	+	713	369	135	130	166	83
Diet and Risk of Cardiovascular Disease in Spain	46	Spain	General popln.	measured	3100	26.1 (4.4)	39.5 (11.5)	62.0 (9.0)	1502 (48)	1228 (41)	1991	19.4 (18.9, 19.5)	+	208	46	23	10	99	16
Zaragoza study	47	Spain	Popln. register	measured	2837	28.8 (5.0)	58.9 (11.7)	61.0 (5.0)	1175 (41)	470 (18)	1994	5.1 (5.1, 5.1)	++	24	24	15	9	0	0
Apolipoprotein Related Mortality Risk Study	48	Sweden	Health check-up	measured	58235	24.7 (3.7)	45.9 (10.4)	66.0 (12.0)	33496 (58)	NA	1989	13.3 (10.8, 15.3)	+	3794	1380	784	262	1517	155
Cohort of Swedish Men	49	Sweden	Popln. register	self-reported	43157	25.8 (3.4)	60.0 (9.7)	73.7 (8.0)	43157 (100)	10494 (25)	1998	10.0 (10.0, 10.0)	+	6017	2325	1291	438	1559	269
Göteborg 1913 Study	50	Sweden	Popln. register	measured	789	25.0 (3.2)	54.1 (1.8)	74.0 (8.0)	789 (100)	423 (54)	1967	25.4 (17.4, 30.5)	++	556	293	170	58	141	27
Göteborg 1933 Study	50	Sweden	Popln. register	measured	753	25.9 (3.4)	50.6 (0.2)	58.0 (4.0)	753 (100)	269 (36)	1984	12.8 (12.7, 13.0)	++	87	28	19	0	27	4
Göteborg 1943 Study	50	Sweden	Popln. register	measured	793	26.2 (3.4)	50.0 (0.0)	56.0 (3.0)	793 (100)	242 (31)	1993	10.0 (9.8, 10.6)	++	28	6	3	1	16	0
MONICA Göteborg Study	19	Sweden	Popln. register	measured	4278	25.0 (3.9)	47.0 (10.6)	65.0 (9.0)	2060 (48)	1259 (30)	1990	13.0 (8.9, 17.7)	++	315	108	70	14	134	18
Malmö Prevention Project	51	Sweden	Popln. screening	measured	32683	24.6 (3.6)	45.7 (7.4)	69.0 (9.0)	21929 (67)	14540 (45)	1980	29.2 (23.9, 31.4)	++	10156	3677	2224	605	3778	615
Prospective Study of Women in Gothenburg	52	Sweden	Popln. register	measured	1460	24.1 (3.8)	46.9 (6.3)	77.0 (10.0)	0 (0)	593 (41)	1969	37.3 (27.2, 40.7)	+	908	375	151	111	234	24
Swedish Mammography Cohort	53	Sweden	Popln. register	self-reported	36213	25.1 (4.0)	61.7 (9.2)	74.3 (8.0)	0 (0)	8280 (23)	1998	10.0 (10.0, 10.0)	+	3182	988	412	269	1024	123
Uppsala Longitudinal Study of Adult Men	54	Sweden	General popln.	measured	2322	25.0 (3.2)	49.6 (0.6)	76.0 (12.0)	2322 (100)	1177 (68)	1972	32.0 (22.2, 36.2)	++	1582	716	422	116	534	85
Women's Lifestyle and Health Study	55	Sweden	Popln. register	self-reported	47177	23.5 (3.6)	40.4 (5.8)	52.1 (6.6)	0 (0)	10101 (21)	1991	15.0 (14.0, 15.0)	+	1080	147	61	49	653	15
Turkish Adult Risk Factor Study	56	Turkey	Household listings	measured	3810	26.7 (5.1)	44.5 (13.7)	70.0 (12.0)	1887 (50)	1366 (36)	1990	19.5 (12.4, 20.0)	+	564	309	199	62	44	6
British Regional Heart Study	57	UK	GP list	measured	7729	25.5 (3.2)	50.2 (5.8)	68.0 (8.0)	7729 (100)	4150 (54)	1979	24.5 (19.1, 24.9)	+	2954	1391	997	207	926	234
British Union Provident Association Study	58	UK	GP list	measured	21501	25.1 (2.8)	47.5 (7.7)	68.0 (9.0)	21501 (100)	8487 (39)	1978	23.7 (21.1, 25.4)	+	3817	1693	1157	272	1441	189
British Women's Heart and Health Study	59	UK	Popln. register	measured	3957	27.6 (5.0)	68.8 (5.5)	78.0 (6.0)	0 (0)	454 (11)	2000	11.0 (10.4, 11.5)	++	814	273	128	83	284	97
Caerphilly Prospective Study	60	UK	Electoral roll	measured	2472	26.2 (3.6)	52.2 (4.5)	62.0 (5.0)	2472 (100)	1370 (55)	1981	13.0 (13.0, 13.0)	++	490	266	213	26	150	33
Hertfordshire Cohort Study	61	UK	General popln.	measured	2987	27.4 (4.4)	66.1 (2.9)	72.0 (4.0)	1571 (53)	378 (13)	2001	8.9 (7.8, 9.9)	+	308	79	40	10	168	26

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Lower Extremity Arterial Disease Event Reduction Trial	62	UK	Popln. register	measured	1544	26.2 (3.8)	68.2 (8.7)	74.0 (8.0)	1544 (100)	587 (38)	1997	4.4 (3.5, 4.9)	++	393	210	142	30	95	55
Midspan Family Study	63	UK	General popln.	measured	2317	26.2 (4.6)	45.1 (6.2)	58.0 (7.0)	1039 (45)	584 (25)	1996	15.4 (15.2, 15.6)	+	135	26	17	3	62	9
The Million Women Study	64	UK	Popln. screening	self-reported	1165552	26.3 (4.7)	56.8 (4.6)	67.4 (6.1)	0 (0)	226637 (21)	1998	13.9 (13.1, 14.8)	++	101340	21748	9759	5744	54692	8818
MRC Study of Older People	65	UK	GP list	measured	13026	26.2 (4.3)	80.2 (3.7)	86.0 (5.0)	5194 (40)	1547 (12)	1996	8.1 (4.3, 10.5)	+	8533	3878	1853	1169	1689	1290
Midspan Collaborative Study	66	UK	Occupational	measured	7000	25.1 (3.2)	47.5 (7.2)	65.0 (8.0)	5998 (86)	3889 (56)	1971	22.5 (20.5, 23.5)	+	2069	1044	752	181	665	149
Northwick Park Heart Study I	67	UK	Occupational	measured	1508	25.5 (3.0)	52.5 (6.7)	72.0 (8.0)	1508 (100)	771 (51)	1976	25.1 (18.8, 26.8)	++	673	315	228	0	214	0
Northwick Park Heart Study II	67	UK	GP list	measured	3013	26.4 (3.5)	56.6 (3.5)	66.0 (5.0)	3013 (100)	1122 (37)	1991	8.4 (7.2, 9.0)	++	473	144	65	27	252	29
Renfew and Paisley Study	68	UK	General popln.	measured	15389	25.8 (4.0)	54.3 (5.6)	66.0 (7.0)	7054 (46)	7881 (51)	1974	16.5 (15.5, 17.5)	+	4440	2291	1567	476	1402	317
Scottish Heart Health Study	60	UK	GP list	measured	17365	26.0 (4.4)	50.1 (8.4)	62.0 (8.0)	8500 (49)	7781 (45)	1986	10.0 (10.0, 10.0)	++	1530	640	442	101	592	103
Speedwell Study	69	UK	GP list	measured	2270	25.7 (3.3)	54.9 (4.4)	66.0 (6.0)	2270 (100)	1062 (47)	1980	16.8 (15.2, 17.7)	++	662	343	249	55	228	47
Thrombosis Prevention Trial	70	UK	GP list	measured	22712	26.6 (3.5)	56.0 (6.8)	67.0 (7.0)	22712 (100)	7189 (32)	1990	11.4 (10.2, 12.8)	++	3098	1267	895	183	1413	190
UK Biobank	71	UK	General popln.	measured	499443	27.4(4.8)	57.8(8.0)	64.5 (6.9)	227517(46)	52528(11)	2009	4.8 (4.1, 5.5)	+	7916	1699	973	296	4755	387
United Kingdom Heart Disease Prevention Project	72	UK	Occupational	measured	13846	25.3 (3.1)	50.7 (5.7)	66.0 (8.0)	13846 (100)	6568 (47)	1972	20.5 (17.5, 23.5)	+	4022	2008	1499	256	1323	286
West of Scotland Coronary Prevention Study	73	UK	Popln. screening	measured	6595	26.0 (3.2)	55.2 (5.5)	67.0 (10.0)	6595 (100)	2907 (44)	1990	4.8 (4.3, 5.3)	++	241	123	102	10	0	0
Whitehall I Study	74	UK	Occupational	measured	18863	24.7 (3.0)	51.6 (6.7)	65.0 (7.0)	18863 (100)	7855 (42)	1968	15.5 (15.5, 15.5)	+	3491	1846	1357	221	1070	284
Whitehall II Study	75	UK	Occupational	measured	10279	24.6 (3.5)	45.0 (6.1)	83.0 (5.0)	6880 (67)	2647 (26)	1987	17.5 (16.9, 18.3)	+	572	119	90	9	155	12
European Prospective Investigation into Cancer and Nutrition	76	Europe	General popln.**	measured	367731	25.9 (4.3)	51.7 (10.4)	64.1 (10.5)	129349 (35)	96296 (27)	1995	12.6 (11.5, 14.0)	+	25347	6516	3042	1498	9857	1108
Subtotal (115 studies)					**3390101**	**26.0 (3.9)**	**52.1 (8.1)**	**67.1 (8.0)**	**1136198 (33.5)**	**812698 (23.8)**	**1987***	**12.6 (11.2, 13.7)**		**305606**	**100287**	**54263**	**21430**	**122606**	**19976**
North America																			
Nova Scotia Health Survey	77	Canada	GP list	measured	1814	27.5 (5.3)	55.1 (15.5)	78.0 (10.0)	889 (49)	492 (27)	1995	9.8 (9.5, 9.9)	++	268	71	41	11	0	0
Quebec Cardiovascular Study	78	Canada	Popln. register	measured	4080	25.8 (3.8)	49.5 (8.3)	68.0 (9.0)	4080 (100)	2400 (59)	1974	21.8 (19.0, 27.8)	++	1143	218	82	28	0	0
Agricultural Health Study	79	USA	Occupational	self-reported	69448	26.9 (4.5)	47.3 (12.5)	67.6 (11.0)	40246 (58)	8681 (13)	1995	10.0 (9.0, 11.0)	+	3556	1117	661	183	1370	218
Air Force/Texas Coronary Atherosclerosis Prevention Study	80	USA	Popln. screening	measured	6605	26.9 (3.1)	58.2 (7.2)	66.0 (7.0)	5608 (85)	652 (12)	1992	5.2 (4.8, 5.9)	++	157	42	7	1	82	0
NIH-AARP Diet and Health Study	81	USA	Popln. register	self-reported	548453	27.1 (4.8)	62.1 (5.4)	69.4 (5.4)	330669 (60)	65318 (12)	1996	10.0 (9.0, 10.0)	+	63876	19576	11608	2508	25033	5277
Atherosclerosis Risk in Communities Study	82	USA	Household listings	measured	15726	27.7 (5.4)	54.7 (5.8)	66.0 (7.0)	7055 (45)	4506 (29)	1988	14.1 (13.3, 14.9)	++	2360	908	465	119	863	166
Breast Cancer Detection Demonstration Project	83	USA	Popln. screening	self-reported	46427	25.1 (4.6)	62.1 (8.0)	74.3 (7.2)	0 (0)	5811 (13)	1988	17.0 (14.0, 18.0)	++	8495	2710	1236	631	3131	665
CLUE II	84	USA	Popln. register	self-reported	21417	26.3 (4.8)	51.3 (14.9)	71.7 (10.3)	8935 (42)	3599 (17)	1989	14.0 (10.0, 17.0)	++	4578	1250	742	192	1161	321
California Teachers Study	85	USA	Occupational	self-reported	124334	24.9 (5.1)	52.7 (13.8)	71.7 (10.4)	0 (0)	6321 (5)	1995	9.0 (9.0, 9.0)	+	5580	1607	733	420	2564	426
Cancer Prevention Study I	86	USA	General popln.	self-reported	808662	24.7 (3.8)	52.7 (10.5)	69.6 (11.4)	275049 (34)	290611 (36)	1959	12.9 (11.9, 12.9)	++	127417	75396	25490	14888	29666	3674
Cancer Prevention Study II	86	USA	General popln.	self-reported	957598	25.1 (4.1)	56.4 (10.6)	79.0 (10.2)	364792 (38)	225837 (24)	1982	28.2 (17.4, 28.3)	++	464055	187302	95853	33830	128649	43577
Cardiovascular Health Study (CHS1)	87	USA	Health insurance list	measured	5155	26.4 (4.5)	72.7 (5.3)	83.0 (6.0)	2215 (43)	598 (12)	1989	13.3 (8.0, 15.4)	++	3086	1232	804	265	726	328
Cardiovascular Health Study (CHS2)	87	USA	Health insurance list	measured	679	28.9 (5.6)	72.8 (5.5)	81.0 (6.0)	252 (37)	99 (15)	1993	12.1 (7.7, 12.2)	++	327	132	85	34	80	31
Charleston Heart Study	88	USA	Household listings	measured	2245	25.4 (4.9)	50.2 (11.1)	74.0 (12.0)	1065 (47)	1226 (55)	1961	26.3 (14.6, 37.9)	++	1697	904	491	183	348	117
Chicago Heart Association Detection Project In Industry	89	USA	Occupational	measured	34244	25.6 (4.1)	40.7 (12.8)	72.0 (12.0)	19892 (58)	14241 (42)	1971	32.0 (28.2, 33.2)	++	11612	4820	3000	786	3630	904
Established Populations for the Epidemiologic Study of the Elderly - East Boston	90	USA	Popln. register	self-reported	1174	27.0 (4.8)	77.4 (4.4)	81.0 (5.0)	432 (37)	125 (11)	1988	4.9 (4.6, 5.3)	+	251	115	32	7	38	34

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Established Populations for the Epidemiologic Study of the Elderly - Iowa	90	USA	Popln. register	measured	1784	26.7 (4.6)	78.2 (4.8)	88.0 (6.0)	623 (35)	88 (5)	1988	9.9 (5.5, 15.1)	+	1625	751	351	152	186	212
Established Populations for the Epidemiologic Study of the Elderly - New Haven	90	USA	Popln. register	self-reported	878	25.5 (4.6)	77.9 (4.8)	82.0 (5.0)	364 (41)	118 (13)	1988	4.3 (4.0, 4.5)	+	213	124	11	10	12	17
Established Populations for the Epidemiologic Study of the Elderly - North Carolina	90	USA	Popln. register	self-reported	1671	26.9 (5.3)	77.4 (4.7)	85.0 (6.0)	594 (36)	206 (12)	1992	7.3 (6.1, 11.4)	+	1075	481	204	109	173	113
Framingham Offspring Study	91	USA		measured	3398	27.4 (5.0)	54.2 (9.7)	70.0 (9.0)	1547 (46)	2 (18)	1992	12.1 (11.1, 13.2)	++	322	45	20	14	148	0
Health Professionals Follow-up Study	92	USA	Occupational	self-reported	50321	25.5 (3.2)	54.8 (9.9)	77.0 (10.0)	50321 (100)	4799 (10)	1986	20.2 (17.4, 20.3)	++	14596	5588	3577	848	4745	960
Honolulu Heart Program	93	USA	Military service registration list	measured	7997	23.9 (3.1)	54.4 (5.6)	73.0 (9.0)	7997 (100)	3497 (44)	1966	27.5 (19.5, 28.5)	++	3433	1084	558	362	1177	263
Iowa Women's Health Study	94	USA	Driver's license register	self-reported	41597	26.1 (4.9)	62.2 (4.2)	74.5 (6.1)	0 (0)	6153 (15)	1986	19.0 (16.0, 19.0)	+	11906	4298	2236	886	4088	1207
Lipid Research Clinics Follow-up Study	95	USA	Health check-up	measured	8789	26.0 (4.3)	47.0 (12.1)	69.0 (12.0)	4691 (53)	3117 (35)	1973	18.5 (17.5, 19.5)	++	1461	715	465	117	343	44
Minnesota Heart Health Project	96	USA	General popln.	measured	17970	26.0 (4.8)	45.4 (14.5)	67.0 (11.0)	8272 (46)	5252 (29)	1984	6.5 (3.5, 8.5)	+	586	250	153	34	188	42
Minnesota Heart Survey	97	USA	General popln.	measured	9930	26.3 (4.9)	44.6 (13.2)	65.0 (10.0)	4662 (47)	2859 (29)	1985	4.5 (3.5, 8.5)	++	327	118	72	18	130	15
Multi-Ethnic Study of Atherosclerosis	98	USA	General popln.	measured	6792	28.3 (5.5)	62.2 (10.2)	75.0 (10.0)	3205 (47)	1015 (15)	2001	8.6 (8.4, 8.6)	++	517	120	74	21	0	0
Multiple Risk Factor Intervention Trial	99	USA	Popln. screening	measured	3878	27.8 (3.4)	46.6 (6.0)	56.0 (6.0)	3878 (100)	2387 (62)	1974	11.3 (10.8, 11.7)	++	290	162	114	11	76	12
NHLBI Framingham Heart Study	100	USA	General popln.	measured	5198	25.6 (4.2)	44.0 (8.6)	73.0 (11.0)	2332 (45)	2980 (57)	1950	33.5 (21.5, 39.5)	++	3257	1398	844	249	820	0
NYU Women's Health Study	101	USA	Occupational	self-reported	14205	24.9 (4.6)	50.4 (8.7)	68.1 (9.4)	0 (0)	2288 (18)	1986	19.0 (17.0, 20.0)	+	1548	297	176	38	646	52
National Health and Nutrition Examination Survey I	102	USA	Census list	measured	14383	25.6 (5.1)	49.0 (15.6)	74.0 (11.0)	5805 (40)	5345 (37)	1972	18.5 (13.5, 19.5)	+	4589	2293	1295	406	1035	384
National Health and Nutrition Examination Survey III	103	USA	Census list	measured	16423	26.8 (5.4)	52.3 (18.3)	78.0 (12.0)	7721 (47)	4374 (27)	1990	14.2 (12.3, 16.2)	+	4853	2195	1266	370	1091	462
National Health Interview Survey	104	USA	Census list	self-reported	316945	27(5.7)	47.5(17.5)	74.6 (14.4)	159950 (44)	80302 (22)	2002	2(3, 8)	+	35632	9213	7173	2040	8552	2069
Nurses' Health Study I	105	USA	Occupational	self-reported	119116	23.8 (4.2)	42.6 (7.2)	69.0 (10.0)	0 (0)	39070 (33)	1976	28.6 (28.5, 28.9)	++	23703	5394	2400	1361	10412	1718
Nurses' Health Study II	106	USA	Occupational	self-reported	78095	24.5 (5.3)	36.0 (4.1)	48.7 (6.8)	0 (0)	11490 (0)	1989	10.0 (6.0, 16.0)	++	1793	181	71	44	813	45
Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial	107	USA	Occupational	self-reported	147070	27.3 (4.9)	62.6 (5.4)	71.7 (6.2)	72195 (49)	15632 (11)	1997	9.0 (7.0, 10.0)	++	14682	4697	2178	691	5616	1291
Physicians' Health Study I & II	108	USA	Occupational	self-reported	28860	25.1 (3.0)	54.8 (9.8)	72.5 (8.6)	28860 (100)	2623 (9)	1982	21.0 (7.0, 23.0)	++	4894	1488	651	296	1850	242
Puerto Rico Heart Health Program	109	USA	Census list	measured	9799	25.1 (4.1)	54.4 (6.6)	65.0 (7.0)	9799 (100)	5175 (53)	1967	12.0 (12.0, 12.0)	++	1728	840	376	186	382	56
Rancho Bernardo Study	110	USA	Household listings	measured	5439	24.5 (3.4)	57.2 (15.0)	79.0 (9.0)	2490 (46)	1327 (24)	1972	18.5 (13.5, 19.5)	+	2172	1106	617	216	558	208
Seven Countries US	4	USA	Occupational	measured	2556	25.5 (3.2)	49.4 (5.8)	77.0 (7.0)	2556 (100)	1507 (59)	1958	25.0 (16.0, 25.0)	+	2128	698	420	95	298	55
Seventh-day Adventist Cohort Study	111	USA	Census list	self-reported	29961	24.6 (4.3)	52.4 (15.5)	72.8 (9.9)	12251 (41)	1112 (4)	1976	12.0 (10.0, 12.0)	++	3850	1863	944	305	1054	256
Strong Heart Study	112	USA	Tribal rolls	measured	4313	30.8 (6.1)	56.4 (8.1)	66.0 (9.0)	1739 (40)	1418 (33)	1990	12.6 (10.0, 13.6)	++	1454	439	211	70	260	109
Tecumseh Study	113	USA	General popln.	measured	4426	25.8 (4.7)	47.1 (12.1)	71.0 (12.0)	2151 (49)	1968 (44)	1960	22.5 (17.5, 26.5)	++	1617	898	489	167	375	114
U.S. Radiologic Technologists (URST) Cohort	114	USA	Occupational	self-reported	87144	25.7 (5.0)	48.9 (9.5)	63.7 (11.8)	20129 (23)	11722 (14)	1995	6.0 (4.0, 6.0)	+	1556	447	231	66	661	111
Vitamins and Lifestyle (VITAL) Study	115	USA	Popln. register	self-reported	72885	27.4 (5.2)	61.4 (7.4)	70.0 (7.2)	35710 (49)	6051 (8)	2001	6.0 (5.0, 6.0)	++	3729	934	525	157	1754	324
Women's Health Initiative (Observational Study)	116	USA	General popln.	measured	91933	27.2 (5.7)	63.6 (7.4)	61.0 (8.0)	0 (0)	5664 (6)	1996	12.0 (8.4, 13.8)	++	12121	3342	1494	878	4528	0
Women's Health Study	117	USA	Occupational	self-reported	38980	26.0 (5.1)	54.6 (7.0)	67.1 (8.6)	0 (0)	5091 (13)	1993	13.0 (12.0, 14.0)	++	2061	355	61	85	802	99
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial	118	USA/Canada/Puerto Rico/US Virgin Islands	Popln. register	measured	41944	29.7 (5.9)	66.8 (7.6)	74.0 (8.0)	22395 (53)	9186 (22)	1994	4.7 (3.9, 5.6)	++	5713	2688	1044	467	1308	0
Subtotal (48 studies)					**3932741**	**26.3 (4.6)**	**55.7 (9.3)**	**71.9 (8.9)**	**1533416 (39.0)**	**874335 (22.2)**	**1988***	**15.6 (11.9, 16.5)**		**867889**	**351902**	**171631**	**64855**	**251422**	**66218**

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Australia/New Zealand																			
45 and Up Study	119	Australia	General popln.	self-reported	244643	27 (4.9)	62 (11)	68.5 (10.7)	115004 (47)	17745 (7.3)	2008	5.9 (5.7, 6.3)	+	16719	4427	2163	1039	6385	1173
Abdominal Aortic Aneurysm Screening Program	120	Australia	Electoral roll	measured	12190	26.9 (3.7)	72.2 (4.4)	76.0 (5.0)	12190 (100)	1330 (11)	1997	3.2 (2.7, 3.6)	+	973	359	239	60	399	68
Australian Diabetes, Obesity and Lifestyle Study	121	Australia	Census list	measured	10823	27.0 (5.0)	52.3 (13.9)	78.0 (11.0)	4868 (45)	1752 (17)	2000	12.6 (12.2, 13.1)	+	1217	266	138	77	314	64
Australian Longitudinal Study of Ageing	122	Australia	Electoral roll	measured	1487	26.1 (4.1)	77.3 (5.7)	84.0 (6.0)	772 (52)	115 (8)	1992	5.0 (2.0, 7.9)	+	403	176	72	38	62	74
Busselton Health Study	123	Australia	Electoral roll	measured	6808	24.8 (3.8)	46.6 (16.8)	78.0 (11.0)	3227 (47)	2116 (31)	1969	24.4 (18.4, 32.7)	+	2526	1297	735	303	644	201
Dubbo Study of the Elderly	124	Australia	Electoral roll	measured	2785	26.0 (4.2)	69.1 (6.9)	80.0 (8.0)	1225 (44)	426 (15)	1989	14.1 (8.3, 14.5)	++	1274	657	419	122	260	129
Health in Men Study	125	Australia	Electoral roll	measured	12190	26.9 (3.7)	72.1 (4.4)	81.0 (5.0)	12190 (100)	1313 (11)	1997	12.6 (8.3, 13.3)	+	5662	1930	1149	387	2047	478
National Heart Foundation Risk Factor Prevalence Survey 1989	126	Australia	Electoral roll	measured	9258	25.4 (4.3)	43.4 (13.5)	62.0 (12.0)	4542 (49)	2230 (24)	1989	8.3 (8.2, 8.5)	+	372	114	76	17	154	21
Newcastle Study	127	Australia	Electoral roll	measured	5924	26.7 (4.5)	51.7 (10.5)	65.0 (8.0)	2948 (50)	1361 (23)	1988	8.9 (3.5, 14.3)	+	514	203	137	33	215	31
Perth Risk Factors Survey	128	Australia	Electoral roll	measured	10218	25.2 (3.9)	45.2 (12.9)	69.0 (12.0)	5288 (52)	2603 (25)	1982	14.5 (8.5, 19.5)	+	818	266	166	51	277	35
Melbourne Collaborative Cohort Study	129	Australia/New Zealand/Europe	Electoral roll	measured	41374	26.9 (4.4)	55.4 (8.7)	71.2 (8.1)	16961 (41)	4663 (11)	1993	15.0 (14.0, 16.0)	+	4771	900	514	200	1737	174
Fletcher Challenge Heart and Health Study	64	New Zealand	Electoral roll	measured	10336	26.4 (4.2)	44.2 (14.9)	69.0 (16.0)	7449 (72)	2423 (24)	1993	5.8 (5.4, 6.2)	+	366	168	112	23	134	21
Subtotal (12 studies)					**368036**	**26.3 (4.2)**	**55.6 (10.3)**	**73.9 (9.3)**	**186664 (50.7)**	**38077 (10.3)**	**1992-3***	**8.0 (7.1, 8.8)**		**35615**	**10763**	**5920**	**2350**	**12628**	**2469**
East Asia																			
Anzhen 02 Cohort Study	127	China	General popln.	measured	4152	24.0 (3.3)	47.0 (8.2)	53.0 (7.0)	2032 (49)	864 (21)	1992	3.0 (3.0, 3.0)	+	19	2	1	1	0	0
Beijing Anzhen Cohort Study	127	China	General popln.	measured	8336	23.9 (3.7)	53.7 (12.7)	71.0 (11.0)	3744 (45)	2377 (29)	1991	4.3 (4.3, 4.3)	+	318	189	58	96	66	11
Beijing Aging Study	130	China	General popln.	measured	2052	23.3 (3.9)	69.5 (8.3)	77.0 (8.0)	1015 (49)	611 (30)	1992	4.8 (4.7, 4.9)	++	401	196	0	83	48	28
Capital Iron & Steel Company Study	131	China	Occupational	measured	5049	23.2 (2.7)	45.3 (7.9)	59.0 (9.0)	5049 (100)	3666 (74)	1980	12.5 (12.5, 13.5)	+	324	104	12	64	104	0
Capital Iron & Steel Company Hospital Cohort	127	China	Occupational	measured	2165	24.7 (3.5)	44.2 (7.4)	49.0 (8.0)	1064 (49)	591 (27)	1992	3.3 (3.2, 3.4)	+	7	1	1	0	3	0
China Hypertension Survey Epidemiology Follow-up Study	132	China	General popln.	measured	142974	22.7 (3.6)	55.8 (10.6)	70.6 (10.9)	70057 (49)	50040 (35)	1991	8.2 (8.1, 8.3)	+	17275	8980	1241	3871	3901	801
China Prospective Study	133	China	Popln. register	measured	217628	21.7 (2.7)	54.7 (10.1)	69.3 (10.2)	217628 (100)	145990 (67)	1991	14.1 (9.2, 14.2)	+	48017	18810	3366	10305	9933	10198
East Beijing Cohort Study	127	China	General popln.	measured	1080	23.6 (3.2)	43.2 (14.9)	71.0 (13.0)	524 (49)	320 (30)	1980	17.1 (9.3, 17.5)	+	85	45	9	19	15	2
Fangshan Cohort Study	134	China	Census list	measured	2606	24.4 (3.6)	47.3 (10.0)	62.0 (12.0)	871 (33)	1018 (39)	1991	3.6 (2.7, 3.7)	+	46	22	0	11	8	1
Huashan Study	127	China	Census/electoral roll	measured	1852	23.4 (3.4)	53.0 (11.6)	66.0 (11.0)	889 (48)	460 (25)	1992	2.8 (2.7, 3.0)	+	26	12	3	6	4	1
Nutrition Intervention Trials - Linxian	135	China	General popln.	measured	29433	22.0 (2.5)	51.9 (8.9)	69.5 (8.8)	13123 (45)	8839 (30)	1985	22.7 (12.6, 24.7)	++	15918	NA	NA	NA	NA	NA
Seven Cities Cohort Study	127	China	General popln.	measured	10690	22.7 (3.6)	53.7 (12.0)	70.0 (10.0)	4877 (46)	3757 (35)	1987	2.7 (2.7, 10.5)	++	859	500	81	183	172	55
Shanghai Cohort Study	136	China	General popln.	self-reported	18066	22.2 (3.0)	55.3 (5.7)	69.3 (7.0)	18074 (100)	9140 (51)	1988	18.0 (16.1, 18.7)	+	4972	1748	449	1040	1984	520
Shanghai Men's Health Study	137	China	General popln.	measured	61339	23.7 (3.1)	55.3 (9.7)	66.3 (9.4)	61339 (100)	35981 (59)	2004	3.1 (2.1, 4.2)	+	938	307	98	136	422	44
Shanghai Women's Health Study	138	China	Popln. register	measured	74828	24.0 (3.4)	52.6 (9.1)	66.2 (8.4)	0 (0)	1778 (2)	1998	8.7 (7.9, 9.4)	+	2882	815	175	450	1349	67
Six Chinese Cohorts Study	127	China	Occupational	measured	19328	21.2 (2.6)	44.7 (7.0)	55.0 (8.0)	10311 (53)	8900 (46)	1983	9.0 (8.1, 9.1)	+	912	287	27	120	380	46
Tianjin Study	139	China	NA	measured	9213	23.6 (3.9)	54.4 (11.9)	70.0 (11.0)	4507 (49)	4692 (51)	1984	6.1 (6.1, 6.1)	+	1158	634	85	287	295	97
Yunnan Tin Miner Cohort Study	140	China	Occupational	measured	6571	21.6 (2.9)	55.8 (9.3)	66.0 (8.0)	6368 (97)	4439 (68)	1992	4.5 (4.4, 4.7)	+	626	222	11	106	237	61
Guangzhou Occupational Cohort Study	141	Hong Kong	Occupational	measured	20537	22.6 (3.0)	42.4 (6.1)	54.0 (8.0)	14029 (68)	9907 (48)	1991	7.5 (6.7, 8.6)	+	250	67	13	36	127	6
Hong Kong Study	142	Hong Kong	Health insurance list	measured	2520	22.2 (3.7)	76.9 (5.2)	81.0 (6.0)	1107 (44)	488 (19)	1991	2.5 (1.5, 3.3)	+	433	141	55	54	104	120
Aito Town Study	127	Japan	General popln.	measured	1708	22.6 (3.0)	51.0 (9.1)	69.0 (9.0)	740 (43)	320 (28)	1981	15.2 (15.0, 16.4)	+	179	57	14	25	62	14

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Akabane Study	127	Japan	General popln.	measured	1832	22.5 (3.0)	54.4 (7.8)	68.0 (8.0)	812 (44)	512 (28)	1985	11.0 (10.7, 12.6)	+	135	34	6	12	57	5
Civil Service Workers Study	143	Japan	Occupational	measured	9312	22.5 (2.7)	46.7 (4.6)	52.0 (4.0)	6228 (67)	3500 (38)	1991	6.7 (6.6, 6.8)	NA	98	12	1	2	60	2
Funagata Study	144	Japan	General popln.	measured	2757	23.7 (3.2)	56.6 (11.5)	75.0 (10.0)	1216 (44)	331 (29)	1991	11.2 (7.3, 12.0)	+	243	76	27	43	105	22
Hisayama Study	145	Japan	Popln. screening	measured	1514	21.6 (2.7)	55.9 (10.9)	75.0 (10.0)	665 (44)	652 (43)	1961	24.6 (12.6, 25.1)	++	781	289	50	172	190	156
Ibaraki Prefectural Health Study	146	Japan	General popln.	measured	97526	23.5 (3.1)	58.8 (10.4)	75.0 (8.5)	33322 (34)	19859 (20)	1993	12.3 (12.1, 12.5)	+	10955	NA	NA	NA	NA	NA
Ikawa, Kyowa, Noichi Study	147	Japan	Popln. screening	measured	2148	23.6 (3.2)	52.2 (8.4)	69.0 (9.0)	951 (44)	682 (32)	1976	16.5 (15.5, 18.5)	++	340	120	11	58	103	24
Japan Collaborative Cohort Study	148	Japan	General popln.	self-reported	86520	22.8 (3.0)	57.6 (10.0)	74.1 (9.4)	36205 (42)	20694 (24)	1989	14.3 (10.4, 15.0)	+	12820	3964	803	1833	4853	1443
Japan Public Health Center–based Prospective Study 1	149	Japan	Residential registry	self-reported	42754	23.6 (3.0)	49.6 (5.9)	61.6 (7.0)	20457 (48)	12124 (28)	1990	15.6 (15.4, 15.9)	++	3391	882	188	399	1501	201
Japan Public Health Center–based Prospective Study 2	149	Japan	Residential registry	self-reported	55669	23.5 (3.1)	54.2 (8.8)	67.1 (8.3)	26402 (47)	15312 (28)	1993	12.8 (11.9, 12.9)	++	5346	1321	337	543	2418	456
Japan Railways	150	Japan	Occupational	measured	54954	22.7 (2.8)	42.8 (7.5)	53.0 (5.0)	54954 (100)	27228 (50)	1976	8.5 (4.5, 10.5)	+	1367	514	122	224	500	33
Konan Health and Nutrition Study	127	Japan	General popln.	measured	1188	21.9 (3.0)	51.6 (15.7)	74.0 (13.0)	532 (45)	359 (30)	1991	6.4 (4.4, 8.4)	+	76	23	2	11	25	9
Kyowa Study	147	Japan	Popln. screening	measured	4189	23.5 (3.2)	53.9 (8.5)	67.0 (8.0)	1816 (43)	1386 (33)	1983	10.5 (8.5, 11.5)	++	284	77	17	33	118	23
Life Span Study Cohort	151	Japan	General popln.	self-reported	49245	22.0 (3.4)	52.0 (13.4)	78.4 (11.4)	19607 (40)	19224 (39)	1969	21.9 (11.0, 32.2)	+	25315	9317	1924	4246	7200	3313
Miyagi Cohort	152	Japan	Residential registry	self-reported	44845	23.6 (3.0)	51.9 (7.5)	64.7 (7.6)	21497 (48)	14445 (32)	1990	13.6 (13.6, 13.6)	++	3435	624	156	272	1279	141
Miyama Cohort Study	153	Japan	Popln. register	measured	1031	22.1 (2.9)	60.4 (9.5)	72.0 (8.0)	461 (45)	305 (30)	1989	6.6 (6.1, 6.7)	+	79	18	2	6	34	5
Noichi Study	147	Japan	Popln. screening	measured	2226	22.9 (3.2)	53.8 (9.2)	71.0 (9.0)	828 (37)	581 (26)	1976	16.5 (14.5, 18.5)	++	372	146	20	60	116	27
Ohasama Study	154	Japan	General popln.	measured	3081	23.6 (3.2)	57.2 (12.2)	71.0 (12.0)	1213 (39)	677 (22)	1990	5.5 (4.5, 5.5)	+	110	40	12	16	39	9
Ohsaki National Health Insurance Cohort Study	155	Japan	Health insurance list	self-reported	47614	23.5 (3.2)	60.1 (10.2)	73.9 (9.0)	22971 (48)	13621 (29)	1995	12.0 (9.8, 12.0)	+	6863	2107	467	984	2343	830
Osaka Study	156	Japan	Popln. register	measured	12601	23.0 (2.8)	52.5 (9.7)	74.0 (11.0)	8588 (68)	4860 (39)	1992	10.2 (6.5, 16.2)	++	721	145	18	38	234	74
Oyabe study	157	Japan	Popln. screening	measured	5150	23.0 (2.9)	56.9 (11.2)	75.0 (10.0)	1608 (31)	988 (19)	1988	10.4 (10.3, 10.5)	++	470	130	28	68	187	49
Saitama Cohort Study	158	Japan	General popln.	measured	3598	22.4 (2.9)	54.5 (11.8)	72.0 (10.0)	1363 (38)	1024 (29)	1987	11.0 (9.0, 12.0)	+	360	118	24	54	144	38
Seven Countries Japan	4	Japan	General popln.	measured	960	22.0 (2.4)	49.8 (5.7)	67.0 (8.0)	960 (100)	700 (73)	1958	24.5 (16.5, 24.5)	+	444	154	34	97	148	36
Shibata Cohort Study	159	Japan	General popln.	measured	2328	22.4 (3.0)	56.7 (11.1)	76.0 (10.0)	984 (42)	770 (33)	1977	20.0 (12.6, 20.0)	++	816	337	65	203	206	94
Shigaraki Town Study	160	Japan	General popln.	measured	3728	22.5 (3.1)	57.1 (13.9)	76.0 (8.0)	1516 (41)	1063 (29)	1993	4.4 (2.4, 5.4)	+	113	28	3	12	55	8
Shirakawa Study	127	Japan	General popln.	measured	4637	21.5 (2.8)	48.0 (12.3)	67.0 (10.0)	2121 (46)	1617 (35)	1977	17.5 (15.5, 18.5)	+	461	163	44	72	164	32
Tanno - Soubetsu Study	161	Japan	General popln.	measured	1983	23.6 (3.2)	51.1 (6.9)	66.0 (8.0)	930 (47)	764 (39)	1977	16.4 (16.4, 17.4)	NA	255	73	20	33	90	0
Three Prefecture Study Aichi	162	Japan	Residential registry	self-reported	32015	22.1 (2.9)	56.0 (11.1)	75.6 (11.1)	15203 (47)	10099 (32)	1985	15.2 (7.7, 15.5)	+	5623	1947	372	779	1903	621
Three Prefecture Study Miyagi	162	Japan	Residential registry	self-reported	29414	23.3 (3.4)	56.7 (11.0)	75.6 (10.9)	13260 (45)	6541 (22)	1984	15.0 (8.0, 15.0)	+	5789	2262	442	1097	1752	586
Toyama Study	163	Japan	Occupational	measured	4524	23.1 (3.0)	45.6 (6.6)	73.0 (11.0)	2907 (64)	1751 (39)	1996	12.7 (12.7, 12.8)	+	97	16	6	3	29	1
Singapore Chinese Health Study	164	Singapore	Household listings	self-reported	63075	23.1 (3.2)	56.5 (8.0)	69.8 (8.2)	27872 (44)	12277 (19)	1994	12.4 (9.8, 13.8)	+	10629	3689	2095	1017	3888	1478
Singapore Thyroid and Heart Study	165	Singapore	Census list	measured	2304	23.6 (4.3)	40.7 (13.4)	66.0 (11.0)	1175 (51)	507 (22)	1984	14.6 (12.7, 15.5)	+	166	58	30	21	35	16
Singapore National Health Survey 1992	166	Singapore	General popln.	measured	3293	23.3 (4.1)	39.2 (12.5)	57.0 (13.0)	1589 (48)	604 (18)	1992	6.2 (6.2, 6.3)	+	71	33	22	6	22	2
Korean Cancer Prevention Study	167	South Korea	Health insurance list	measured	1087380	23.4 (2.8)	50.0 (10.4)	70.8 (11.1)	672475 (62)	404324 (37)	1992	18.0 (17.3, 19.0)	+	167893	40382	9063	21835	60919	10163
Korean Medical Insurance Corporation Study	168	South Korea	Health insurance list	measured	183368	23.0 (2.5)	44.1 (6.7)	51.0 (7.0)	115547 (63)	61588 (38)	1992	4.0 (4.0, 4.0)	+	2908	490	114	256	1232	54
Korean Multi-center Cancer Cohort Study	169	South Korea	Popln. screening	measured	15991	23.7 (3.2)	55.6 (12.2)	71.1 (10.2)	6342 (40)	4110 (26)	1998	6.6 (3.5, 9.3)	++	1293	330	74	183	385	94
Seoul Male Cancer Cohort	170	South Korea	Health insurance list	self-reported	13951	23.4 (2.3)	49.2 (5.2)	60.8 (6.4)	13951 (100)	6926 (50)	1992	15.1 (14.9, 15.1)	+	844	151	54	64	447	26

Notes are at the end of eTable 1, on page 10.

eTable 1 (continued)

Study	Ref	Country	Population source	Weight & height assessment	Total participants	Mean (SD) BMI	Mean (SD) age at survey	Mean (SD) age at death	No (%) males	No (%) current smokers	Median baseline survey year	Median (IQR) follow-up time	Death ascertainment	Number of deaths					
														All-cause mortality	CVD	CHD	Stroke	Cancer	Respiratory disease
Cardiovascular Disease Risk Factors Two-Township Study	171	Taiwan	General popln.	measured	5005	23.8 (3.5)	48.2 (15.1)	73.8 (11.9)	2208 (44)	1116 (22)	1991	15.7 (14.9, 16.7)	+	823	218	49	117	225	82
Community-based Cancer Screening Project	172	Taiwan	General popln.	measured	23716	24.0 (3.4)	47.3 (10.0)	64.3 (9.4)	11939 (50)	6002 (25)	1991	15.9 (15.5, 16.3)	+	2748	558	158	258	1033	162
The Kinmen Neurological Disorders Survey	173	Taiwan	General popln.	measured	1262	23.4 (3.4)	62.7 (9.2)	77.0 (10.0)	669 (53)	353 (30)	1994	2.9 (2.8, 2.9)	+	83	34	8	9	30	6
Electrical Generating Authority of Thailand Study	174	Thailand	Occupational	measured	3490	23.1 (3.1)	43.0 (5.1)	53.0 (6.0)	2697 (77)	1509 (43)	1985	11.4 (11.4, 11.4)	+	164	51	28	16	43	0
Subtotal (61 studies)					**2654305**	**23.0 (3.1)**	**52.4 (9.6)**	**67.8 (9.2)**	**1593389 (60.0)**	**975163 (36.7)**	**1990***	**13.9 (12.2, 14.8)**		**370426**	**104070**	**22595**	**52045**	**113326**	**32393**
South Asia																			
Health Effects of Arsenic Longitudinal Study	175	Bangladesh	General popln.	measured	11062	19.9 (3.1)	37.1 (9.9)	51.6 (11.0)	4798 (43)	3189 (29)	2001	6.7 (6.2, 7.1)	++	351	93	30	39	59	23
Mumbai Cohort Study	176	India	Electoral roll	measured	143111	22.5 (4.0)	50.6 (11.0)	65.0 (12.0)	85576 (60)	21862 (15)	1993	5.7 (5.2, 6.1)	++	11916	3796	2103	762	747	1061
Trivandrum Oral Cancer Screening Trial	177	India	General popln.	measured	126055	22.0 (3.9)	49.3 (12.2)	67.3 (12.2)	48668 (39)	27597 (22)	1997	8.2 (5.8, 9.2)	+	9983	3829	2454	1190	1216	1140
Subtotal (3 studies)					**280228**	**21.5 (3.7)**	**45.7 (11.0)**	**61.3 (11.8)**	**139042 (50)**	**52648 (19)**	**1997***	**6.9 (5.5, 7.5)**		**22250**	**7718**	**4587**	**1991**	**2022**	**2224**
TOTAL (239 studies)					**10625411**	**25.2 (3.9)**	**53.1 (8.9)**	**68.5 (8.6)**	**4588709 (43.2)**	**2752921 (26)**	**1989***	**13.7 (11.4, 14.7)**		**1601786**	**574740**	**258996**	**142671**	**502004**	**123280**

Data are for participants with BMI $\geqslant$15 or $\leqslant$60kg/m^2, or with a baseline age $\geqslant$20 or $\leqslant$89 years.

Inverse probability sampling weights were used to account for the complex survey study design of the National Health and Nutrition Examination Survey I and III and the National Health Interview Survey.

Ref = reference number in the list of references in eAppendix 5.

NA: Not available.

Death ascertainment method: +, Death certificate only; ++, Death certificate supplemented by medical record.

** EPIC participants were recruited from the general population of their respective countries, with the following exceptions: the French cohort was occupational; the Italian and Spanish studies included members of blood donor associations and the general population; the Utrecht (the Netherlands) and Florence (Italy) studies were from population screening; the Oxford UK study included many vegetarians, vegans, and low meat eaters; and the studies in France, Norway, Naples (Italy) and Utrecht (the Netherlands) included only women.

†Analysis omitted data on 2961 participants from two studies that each recorded fewer than 10 deaths, so a total of 12 deaths were omitted from the Capital Iron & Steel Company Hospital Cohort and the Risk Factors and Life Expectancy Pooling Project (GREPCO).

* For subtotals and for the total (all studies), the table gives the median of the study-specific median baseline survey year; for all 239 studies this is 1989 (IQR 1980-1993)

eTable 2: Chronic diseases recorded in each participating study at baseline examination

Study	Ref	Country	Heart disease	Stroke	Other vascular disease	Cancer	Respiratory diseases
Europe							
Vorarlberg Health Monitoring and Promotion Programme	1	Austria					
Belgian Inter-university Research on Nutrition and Health	2	Belgium	✔				
Flemish Study on Environment Genes and Health (FLEMENGHO)	3	Belgium					
Seven Countries Croatia	4	Croatia	✔				
Copenhagen City Heart Study	5	Denmark	✔	✔			
Research Centre for Prevention and Health (Glostrup Population Studies)	6	Denmark	✔				
Finnish Mobile Clinic Survey	7	Finland	✔				
Finrisk Cohort 1977	8	Finland	✔	✔			
Finrisk Cohort 1982	8	Finland	✔	✔			
Finrisk Cohort 1987	8	Finland	✔	✔			
Finrisk Cohort 1992	8	Finland	✔	✔		✔	
Finrisk Cohort 1997	8	Finland	✔	✔		✔	
Helsinki Aging Study	9	Finland	✔				
Helsinki Businessmen Study	10	Finland	✔				
Kuopio Ischaemic Heart Disease Study	11	Finland	✔	✔	✔	✔	✔
North Karelia Project	12	Finland	✔	✔		✔	
Seven Countries Finland	4	Finland	✔	✔			
Centre d'Investigations Preventives et Cliniques (IPC) Paris	13	France	✔				
Data from an Epidemiological Study on the Insulin Resistance Syndrome	14	France	✔	✔	✔		
Paris Prospective Study I	15	France	✔	✔			
Prospective Epidemiological Study of Myocardial Infarction	16	France / NI	✔	✔	✔	✔	✔
Epidemiologische Studie zu Chancen der Verhütung	17	Germany	✔	✔		✔	
Göttingen Risk Incidence and Prevalence Study	18	Germany	✔	✔	✔		
MONICA/KORA Augsburg Survey 1	19	Germany	✔	✔			
MONICA/KORA Augsburg Survey 2	19	Germany	✔	✔			
MONICA/KORA Augsburg Survey 3	19	Germany	✔	✔			
Prospective Cardiovascular Münster Study	20	Germany	✔	✔			
Study of Health in Pomerania	21	Germany	✔	✔	✔	✔	
Württemberg Construction Workers Cohort	22	Germany	✔	✔			
ATTICA Study	23	Greece					
Seven Countries Greece	4	Greece	✔	✔			
Reykjavik Study	24	Iceland	✔	✔	✔	✔	
Bezafibrate Infarction Prevention Registry Study	25	Israel	✔	✔	✔		
Israeli Ischaemic Heart Disease Study	26	Israel	✔				
Glucose Intolerance Obesity and Hypertension Study	27	Israel	✔	✔			
Bruneck Study	28	Italy	✔	✔	✔		
Cardiovascular Study in the Elderly	29	Italy	✔	✔	✔		✔
Occupational Groups (OG), Rome	30	Italy	✔	✔			
Progetto CUORE (ATENA)	31	Italy	✔	✔			
Progetto CUORE (EMOFRI)	31	Italy	✔	✔			
Progetto CUORE (MATISS83)	31	Italy	✔	✔		✔	
Progetto CUORE (MATISS87)	31	Italy	✔	✔		✔	
Progetto CUORE (MATISS93)	31	Italy	✔	✔		✔	
Progetto CUORE (MONFRI86)	31	Italy	✔	✔			
Progetto CUORE (MONFRI89)	31	Italy	✔	✔			
Progetto CUORE (MONFRI94)	31	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (ATS_SAR)	32	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (DISCO)	32	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (GREPCO)	32	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (GUBBIO)	32	Italy					
Risk Factors and Life Expectancy Pooling Project (MICOL)	32	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (MONICA)	32	Italy					
Risk Factors and Life Expectancy Pooling Project (NFR)	32	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (OB43)	32	Italy	✔	✔			
Risk Factors and Life Expectancy Pooling Project (RF2)	32	Italy	✔	✔			
Seven Countries Italy	4	Italy	✔	✔			
Vicenza Thrombophilia and Athrosclerosis Project	33	Italy	✔	✔	✔		
Consultation Bureau Project	34	Netherlands	✔	✔			
Hoorn Study	35	Netherlands	✔	✔	✔		
Longitudinal Aging Study Amsterdam	36	Netherlands	✔	✔	✔		

Ref = reference number in the list of references in eAppendix 5.

eTable 2 (continued)

Study	Ref	Country	Heart disease	Stroke	Other vascular disease	Cancer	Respiratory diseases
Monitoring of CVD Risk Factors Project	37	Netherlands	✔	✔	✔		
Prevention of Renal and Vascular End Stage Disease Study	38	Netherlands	✔	✔	✔		
Seven Countries Netherlands	4	Netherlands	✔	✔			
The Rotterdam Study	39	Netherlands	✔	✔	✔		
The Rotterdam Study II	39	Netherlands	✔	✔	✔		
The Rotterdam Study III	39	Netherlands	✔	✔	✔		
Cohort of Norway (FINNMARK)	40	Norway	✔	✔			
Cohort of Norway (HUBRO)	40	Norway	✔	✔			
Cohort of Norway (OPPHED)	40	Norway	✔	✔			
Cohort of Norway (OSLO2)	40	Norway	✔	✔			
Cohort of Norway (TROMS)	40	Norway	✔	✔			
Norwegian Counties Study (NCS1)	41	Norway	✔	✔			
Norwegian Counties Study (NCS2)	41	Norway	✔	✔			
Norwegian Counties Study (NCS3)	41	Norway	✔	✔			
Oslo Study	42	Norway	✔	✔			
Tromsø Study	43	Norway	✔	✔	✔		
Edinburgh Artery Study	44	Scotland	✔	✔	✔		
Prospective Study of Pravastatin in the Elderly at Risk	45	Scotland/Ireland/Net herland	✔	✔	✔		
Seven Countries Serbia	4	Serbia	✔	✔			
Diet and Risk of Cardiovascular Disease in Spain	46	Spain	✔	✔			
Zaragoza study	47	Spain					
Apolipoprotein Related Mortality Risk Study	48	Sweden	✔	✔	✔	✔	
Cohort of Swedish Men	49	Sweden	✔			✔	
Göteborg 1913 Study	50	Sweden	✔	✔			
Göteborg 1933 Study	50	Sweden	✔	✔			
Göteborg 1943 Study	50	Sweden	✔	✔			
MONICA Göteborg Study	19	Sweden	✔	✔			
Malmö Prevention Project	51	Sweden	✔	✔		✔	
Prospective Study of Women in Gothenburg	52	Sweden	✔	✔		✔	
Swedish Mammography Cohort	53	Sweden	✔			✔	
Uppsala Longitudinal Study of Adult Men	54	Sweden	✔	✔	✔	✔	
Women's Lifestyle and Health Study	55	Sweden	✔			✔	
Turkish Adult Risk Factor Study	56	Turkey	✔	✔	✔		
British Regional Heart Study	57	UK	✔	✔			
British Union Provident Association Study	58	UK	✔	✔	✔		
British Women's Heart and Health Study	59	UK	✔	✔	✔		
Caerphilly Prospective Study	60	UK	✔	✔			
Hertfordshire Cohort Study	61	UK	✔	✔			
Lower Extremity Arterial Disease Event Reduction Trial	62	UK	✔	✔			
Midspan Family Study	63	UK	✔	✔			
The Million Women Study	64	UK	✔	✔	✔	✔	✔
MRC Study of Older People	65	UK	✔	✔		✔	
Midspan Collaborative Study	66	UK	✔				
Northwick Park Heart Study I	66	UK	✔	✔			
Northwick Park Heart Study II	67	UK	✔			✔	
Renfew and Paisley Study	68	UK	✔	✔			
Scottish Heart Health Study	60	UK	✔	✔	✔		
Speedwell Study	69	UK	✔	✔			
Thrombosis Prevention Trial	70	UK					
UK Biobank	71	UK	✔	✔	✔	✔	✔
United Kingdom Heart Disease Prevention Project	72	UK	✔	✔			
West of Scotland Coronary Prevention Study	73	UK	✔				
Whitehall I Study	74	UK	✔	✔			
Whitehall II Study	75	UK	✔	✔			
European Prospective Investigation into Cancer and Nutrition	76	Europe	✔	✔	✔		
North America							
Nova Scotia Health Survey	77	Canada	✔	✔	✔	✔	
Quebec Cardiovascular Study	78	Canada	✔	✔	✔	✔	
Agricultural Health Study	79	USA	✔			✔	
Air Force/Texas Coronary Atherosclerosis Prevention Study	80	USA		✔		✔	
NIH-AARP Diet and Health	81	USA	✔			✔	

Ref = reference number in the list of references in eAppendix 5.

eTable 2 (continued)

Study	Ref	Country	Heart disease	Stroke	Other vascular disease	Cancer	Respiratory diseases
Atherosclerosis Risk in Communities Study	82	USA	✔	✔	✔	✔	✔
Breast Cancer Detection Demonstration Project	83	USA	✔			✔	
CLUE II	84	USA				✔	
California Teachers Study	85	USA	✔			✔	
Cancer Prevention Study I	86	USA	✔	✔		✔	✔
Cancer Prevention Study II	86	USA	✔	✔		✔	✔
Cardiovascular Health Study (CHS1)	87	USA	✔	✔	✔		
Cardiovascular Health Study (CHS2)	87	USA	✔	✔	✔		
Charleston Heart Study	88	USA	✔	✔		✔	
Chicago Heart Association Detection Project In Industry	89	USA					
Established Populations for the Epidemiologic Studies of the Elderly - East Boston	90	USA	✔	✔	✔	✔	
Established Populations for the Epidemiologic Studies of the Elderly - Iowa	90	USA	✔	✔	✔	✔	
Established Populations for the Epidemiologic Studies of the Elderly - New Haven	90	USA	✔	✔	✔	✔	
Established Populations for the Epidemiologic Studies of the Elderly - North Carolina	90	USA	✔	✔	✔	✔	
Framingham Offspring Study	91	USA					
Health Professionals Follow-up Study	92	USA	✔	✔			
Honolulu Heart Program	93	USA	✔	✔			
Iowa Women's Health Study	94	USA	✔			✔	
Lipid Research Clinics Follow-up Study	95	USA	✔				
Minnesota Heart Health Project	96	USA	✔	✔			
Minnesota Heart Survey	97	USA	✔	✔			
Multi-Ethnic Study of Atherosclerosis	98	USA	✔	✔	✔		
Multiple Risk Factor Intervention Trial	99	USA	✔	✔		✔	
NHLBI Framingham Heart Study	100	USA	✔	✔			
NYU Women's Health Study	101	USA	✔			✔	
National Health and Nutrition Examination Survey I	102	USA	✔	✔			
National Health and Nutrition Examination Survey III	103	USA	✔	✔	✔	✔	
National Health Interview Survey	104	USA	✔	✔		✔	
Nurses' Health Study I	105	USA	✔				
Nurses' Health Study II	106	USA	✔	✔	✔	✔	✔
Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial	107	USA	✔			✔	
Physicians' Health Study I & II	108	USA	✔			✔	
Puerto Rico Heart Health Program	109	USA	✔	✔	✔		
Rancho Bernardo Study	110	USA	✔	✔			
Seven Countries US	4	USA	✔	✔			
Seventh-day Adventist Cohort Study	111	USA	✔			✔	
Strong Heart Study	112	USA	✔	✔			
Tecumseh Study	113	USA	✔				
U.S. Radiologic Technologists (URST) Cohort	114	USA	✔			✔	
Vitamins and Lifestyle (VITAL) Study	115	USA	✔			✔	
Women's Health Initiative (Oberservational Study)	116	USA	✔	✔	✔		
Women's Health Study	117	USA	✔			✔	
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial	118	USA/Canada/Puerto Rico/US Virgin Islands	✔	✔	✔		
Australia/New Zealand							
45 and Up Study	119	Australia	✔	✔		✔	
Abdominal Aortic Aneurysm Screening Program	120	Australia	✔	✔			
Australian Diabetes, Obesity and Lifestyle Study	121	Australia	✔	✔	✔		
Australian Longitudinal Study of Ageing	122	Australia	✔	✔			
Busselton Health Study	123	Australia	✔	✔			
Dubbo Study of the Elderly	124	Australia	✔	✔	✔	✔	
Health in Men Study	125	Australia	✔	✔	✔		
National Heart Foundation Risk Factor Prevalence Survey 1989	126	Australia	✔	✔			
Newcastle Study	127	Australia	✔	✔			
Perth Risk Factors Survey	128	Australia	✔	✔			
Melbourne Collaborative Cohort Study	129	Australia/New Zealand/Europe				✔	
Fletcher Challenge Heart and Health Study	64	New Zealand	✔	✔			
East Asia							
Anzhen 02 Cohort Study	127	China					
Beijing Anzhen Cohort Study	127	China	✔	✔			
Beijing Aging Study	130	China	✔	✔			
Capital Iron & Steel Company Study	131	China	✔	✔			
Capital Iron & Steel Company Hospital Cohort	127	China	✔	✔			
China Hypertension Survey Epidemiology Follow-up Study	132	China	✔	✔	✔		
China Prospective Study	133	China	✔	✔		✔	✔
East Beijing Cohort Study	127	China	✔	✔			

Ref = reference number in the list of references in eAppendix 5.

eTable 2 (continued)

Study	Ref	Country	Heart disease	Stroke	Other vascular disease	Cancer	Respiratory diseases
Fangshan Cohort Study	134	China	✔	✔			
Huashan Study	127	China	✔	✔			
Nutrition Intervention Trials - Linxian	135	China	✔	✔	✔		
Seven Cities Cohorts Study	127	China	✔	✔			
Shanghai Cohort Study	136	China					
Shanghai Men's Health Study	137	China	✔		✔		✔
Shanghai Women's Health Study	138	China	✔	✔	✔		✔
Six Chinese Cohorts Study	127	China					
Tianjin Study	139	China	✔	✔			
Yunnan Tin Miner Cohort Study	140	China					
Guangzhou Occupational Cohort study	141	Hong Kong					
Hong Kong Study	142	Hong Kong	✔	✔			
Aito Town Study	127	Japan	✔	✔			
Akabane Study	127	Japan	✔	✔			
Civil Service Workers Study	143	Japan	✔	✔			
Funagata Study	144	Japan					
Hisayama Study	145	Japan		✔			
Ibaraki Prefectural Health Study	146	Japan	✔	✔	✔		
Ikawa, Kyowa, Noichi Study	147	Japan	✔	✔			
Japan Collaborative Cohort Study	148	Japan	✔	✔	✔	✔	
Japan Public Health Center–based Prospective Study 1	149	Japan	✔	✔	✔	✔	
Japan Public Health Center–based Prospective Study 2	149	Japan	✔	✔	✔	✔	
Japan Railways	150	Japan					
Konan Health and Nutrition Study	127	Japan	✔	✔			
Kyowa Study	147	Japan	✔	✔			
Life Span Study Cohort	151	Japan					
Miyagi Cohort	152	Japan	✔	✔	✔	✔	
Miyama Cohort Study	153	Japan	✔	✔			
Noichi Study	147	Japan	✔	✔			
Ohasama Study	154	Japan	✔	✔			
Ohsaki National Health Insurance Cohort Study	155	Japan	✔	✔	✔	✔	
Osaka Study	156	Japan	✔	✔			
Oyabe study	157	Japan		✔			
Saitama Cohort Study	158	Japan	✔	✔			
Seven Countries Japan	4	Japan	✔	✔			
Shibata Cohort Study	159	Japan	✔	✔			
Shigaraki Town Study	160	Japan	✔	✔			
Shirakawa Study	127	Japan	✔	✔			
Tanno - Soubetsu Study	161	Japan					
Three Prefecture Study Aichi	162	Japan	✔		✔	✔	✔
Three Prefecture Study Miyagi	162	Japan	✔	✔	✔	✔	
Toyama Study	163	Japan					
Singapore Chinese Health Study	164	Singapore	✔	✔	✔	✔	
Singapore Thyroid and Heart Study	165	Singapore	✔	✔			
Singapore National Health Survey 1992	166	Singapore	✔	✔			
Korean Cancer Prevention Study	167	South Korea	✔	✔		✔	✔
Korean Medical Insurance Corporation Study	168	South Korea					
Korean Multi-center Cancer Cohort Study	169	South Korea		✔		✔	✔
Seoul Male Cancer Cohort	170	South Korea	✔	✔	✔		
Cardiovascular Disease Risk Factors Two-Township Study	171	Taiwan	✔		✔	✔	
Community-based Cancer Screening Project	172	Taiwan	✔	✔	✔	✔	
The Kinmen Neurological Disorders Survey	173	Taiwan	✔	✔			
Electrical Generating Authority of Thailand Study	174	Thailand					
South Asia							
Health Effects of Arsenic Longitudinal Study	175	Bangladesh	✔		✔	✔	
Mumbai Cohort Study	176	India					
Trivandrum Oral Cancer Screening Trial	177	India	✔		✔	✔	✔

Ref = reference number in the list of references in eAppendix 5.

eTable 3: Mortality outcomes and their International Classification of Diseases codes

	ICD version		
	ICD-8	**ICD-9**	**ICD-10**
Cardiovascular disease	390-458, 795	390-459, 798	I00-I99, R96
Coronary heart disease	410-414	410-414	I20-I25
Stroke	430-438	430-438	I60-I69
Neoplastic disease	140-239	140-239	C00-C97, D00-D48
Respiratory disease	460-519	460-519	J00-J99

eTable 4: Six WHO BMI groups vs all-cause mortality, by successively stricter inclusion criteria, in all 237 studies

Exclude baseline chronic disease?	Adjust for smoking?	Exclude the first 5years follow-up?	Restrict analyses to never-smokers?	No of studies	No of partici-pants	No of deaths	Underweight (BMI 15 to <18.5)		Normal weight (18.5 to <25)		Overweight (25 to <30)		Obesity Grade I (30 to <35)		Obesity Grade II (35 to <40)		Obesity Grade III (40 to <60)	
							No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)
All Studies																		
				237	10,622,450	1,601,774	68,455	1.82 (1.74, 1.91)	810,838	1.00 (0.98, 1.02)	526,098	0.95 (0.94, 0.97)	144,871	1.17 (1.16, 1.18)	36,113	1.49 (1.47, 1.51)	15,399	1.95 (1.90, 2.01)
√				236	9,104,247	1,210,250	52,789	1.81 (1.72, 1.91)	631,488	1.00 (0.98, 1.02)	388,781	0.95 (0.95, 0.96)	102,315	1.18 (1.16, 1.20)	24,556	1.52 (1.48, 1.55)	10,321	2.05 (1.98, 2.13)
√	√			234	8,801,617	1,185,728	51,170	1.70 (1.61, 1.80)	618,881	1.00 (0.98, 1.02)	381,617	0.99 (0.98, 1.00)	100,113	1.25 (1.23, 1.27)	23,945	1.63 (1.59, 1.66)	10,002	2.24 (2.15, 2.33)
√	√	√		213	7,805,434	949,010	33,817	1.60 (1.51, 1.70)	496,310	1.00 (0.98, 1.02)	312,450	1.03 (1.01, 1.04)	80,037	1.31 (1.29, 1.33)	18,737	1.70 (1.67, 1.74)	7,659	2.36 (2.27, 2.45)
√			√	215	4,425,240	481,928	20,091	1.53 (1.45, 1.60)	241,359	1.00 (0.98, 1.02)	158,243	1.07 (1.07, 1.08)	45,802	1.38 (1.36, 1.41)	11,504	1.81 (1.76, 1.87)	4,929	2.54 (2.41, 2.67)
√		√	√	189	3,951,455	385,879	12,726	1.47 (1.39, 1.55)	192,523	1.00 (0.98, 1.02)	130,293	1.11 (1.10, 1.11)	37,318	1.44 (1.41, 1.47)	9,179	1.92 (1.86, 1.98)	3,840	2.71 (2.55, 2.86)
Europe																		
				114	3,389,305	305,601	5,823	2.14 (1.98, 2.31)	127,353	1.00 (0.98, 1.02)	117,996	0.95 (0.94, 0.95)	39,533	1.15 (1.13, 1.18)	10,674	1.49 (1.45, 1.54)	4,222	2.06 (1.98, 2.14)
√				113	2,924,772	241,415	4,464	2.14 (1.98, 2.31)	103,986	1.00 (0.98, 1.02)	92,812	0.95 (0.95, 0.95)	29,564	1.16 (1.13, 1.18)	7,664	1.49 (1.45, 1.54)	2,925	2.11 (2.02, 2.21)
√	√			112	2,773,056	231,023	4,279	1.92 (1.79, 2.07)	99,750	1.00 (0.98, 1.02)	88,891	1.00 (0.99, 1.00)	28,132	1.24 (1.21, 1.26)	7,262	1.64 (1.58, 1.69)	2,709	2.35 (2.24, 2.47)
√	√	√		105	2,507,123	184,323	3,120	1.75 (1.62, 1.90)	80,225	1.00 (0.98, 1.02)	71,068	1.03 (1.03, 1.03)	22,097	1.29 (1.26, 1.32)	5,652	1.73 (1.66, 1.79)	2,161	2.56 (2.42, 2.70)
√			√	98	1,245,060	70,865	910	1.72 (1.59, 1.86)	27,912	1.00 (0.97, 1.03)	27,216	1.09 (1.09, 1.10)	10,488	1.43 (1.38, 1.49)	3,125	1.90 (1.80, 2.01)	1,214	2.81 (2.63, 3.01)
√		√	√	89	1,135,600	56,477	675	1.69 (1.56, 1.85)	22,235	1.00 (0.96, 1.04)	21,785	1.12 (1.11, 1.13)	8,386	1.51 (1.45, 1.56)	2,424	2.01 (1.87, 2.17)	972	3.00 (2.80, 3.22)
North America																		
				48	3,932,741	867,889	20,982	1.80 (1.69, 1.92)	397,766	1.00 (0.97, 1.03)	322,182	0.96 (0.95, 0.97)	93,096	1.16 (1.14, 1.19)	23,410	1.46 (1.42, 1.51)	10,453	1.95 (1.85, 2.07)
√				48	3,114,974	594,278	12,348	1.75 (1.63, 1.88)	272,770	1.00 (0.97, 1.03)	223,187	0.97 (0.96, 0.98)	63,550	1.18 (1.15, 1.21)	15,521	1.49 (1.43, 1.55)	6,902	2.05 (1.92, 2.19)
√	√			47	3,083,899	590,668	12,281	1.59 (1.49, 1.70)	271,427	1.00 (0.98, 1.02)	221,752	1.01 (1.01, 1.02)	63,028	1.26 (1.23, 1.29)	15,354	1.60 (1.53, 1.67)	6,826	2.22 (2.07, 2.38)
√	√	√		45	2,789,678	496,720	9,456	1.50 (1.42, 1.59)	230,905	1.00 (0.98, 1.02)	187,109	1.04 (1.03, 1.05)	51,771	1.32 (1.28, 1.35)	12,254	1.72 (1.65, 1.80)	5,225	2.39 (2.23, 2.55)
√			√	43	1,563,123	258,393	5,029	1.46 (1.37, 1.57)	116,307	1.00 (0.97, 1.03)	95,761	1.08 (1.06, 1.09)	30,185	1.36 (1.31, 1.40)	7,664	1.83 (1.73, 1.94)	3,447	2.46 (2.27, 2.66)
√		√	√	40	1,415,087	219,922	3,846	1.44 (1.33, 1.55)	99,792	1.00 (0.97, 1.03)	81,935	1.10 (1.08, 1.12)	25,348	1.40 (1.35, 1.44)	6,299	1.96 (1.84, 2.08)	2,702	2.64 (2.41, 2.88)
Australia / NZ																		
				12	368,036	35,615	821	2.05 (1.80, 2.33)	13,535	1.00 (0.97, 1.03)	14,301	0.90 (0.87, 0.92)	5,139	1.04 (0.99, 1.10)	1,353	1.43 (1.35, 1.53)	466	2.02 (1.84, 2.23)
√				12	289,343	20,814	441	1.99 (1.76, 2.25)	7,919	1.00 (0.97, 1.04)	8,410	0.90 (0.86, 0.93)	3,004	1.04 (0.97, 1.11)	782	1.45 (1.33, 1.57)	258	2.00 (1.76, 2.29)
√	√			12	280,326	20,193	416	1.81 (1.58, 2.07)	7,623	1.00 (0.97, 1.04)	8,182	0.94 (0.88, 0.99)	2,951	1.09 (1.01, 1.17)	767	1.52 (1.39, 1.68)	254	2.10 (1.85, 2.39)
√	√	√		11	260,710	11,655	163	1.55 (1.33, 1.82)	4,218	1.00 (0.94, 1.07)	4,930	0.98 (0.94, 1.02)	1,774	1.19 (1.14, 1.25)	453	1.73 (1.51, 1.97)	117	1.85 (1.46, 2.33)
√			√	12	157,904	8,169	159	1.51 (1.29, 1.78)	3,148	1.00 (0.97, 1.03)	3,231	0.99 (0.94, 1.05)	1,175	1.21 (1.12, 1.30)	339	1.66 (1.46, 1.89)	117	2.12 (1.64, 2.76)
√		√	√	11	149,602	4,656	63	1.41 (1.10, 1.82)	1,692	1.00 (0.96, 1.04)	1,924	1.01 (0.93, 1.08)	717	1.28 (1.18, 1.40)	203	1.76 (1.53, 2.03)	57	2.11 (1.62, 2.74)
East Asia																		
				60	2,652,140	370,419	34,513	1.49 (1.35, 1.64)	259,718	1.00 (0.99, 1.01)	68,738	0.99 (0.95, 1.02)	6,613	1.32 (1.25, 1.39)	604	1.66 (1.49, 1.84)	233	1.54 (1.29, 1.84)
√				60	2,500,583	332,658	29,713	1.48 (1.33, 1.65)	234,917	1.00 (0.99, 1.01)	61,574	0.98 (0.94, 1.02)	5,723	1.30 (1.23, 1.38)	519	1.74 (1.53, 1.98)	212	1.61 (1.33, 1.93)
√	√			60	2,389,761	322,759	28,371	1.48 (1.30, 1.68)	228,185	1.00 (0.98, 1.02)	59,994	1.00 (0.97, 1.04)	5,528	1.31 (1.26, 1.37)	492	1.73 (1.51, 1.97)	189	1.67 (1.35, 2.07)
√	√	√		49	2,029,374	250,310	19,434	1.37 (1.18, 1.60)	177,579	1.00 (0.98, 1.02)	48,534	1.04 (1.00, 1.08)	4,259	1.36 (1.30, 1.42)	354	1.60 (1.41, 1.82)	150	1.48 (1.19, 1.82)
√			√	59	1,241,291	130,234	10,502	1.48 (1.35, 1.62)	85,810	1.00 (0.97, 1.03)	29,913	1.08 (1.06, 1.10)	3,564	1.47 (1.38, 1.56)	314	1.68 (1.44, 1.95)	131	1.59 (1.29, 1.96)
√		√	√	46	1,074,385	100,784	7,178	1.40 (1.25, 1.57)	66,498	1.00 (0.97, 1.03)	24,020	1.12 (1.10, 1.14)	2,753	1.53 (1.43, 1.63)	231	1.71 (1.44, 2.03)	104	1.62 (1.26, 2.10)
South Asia																		
				3	280,228	22,250	6,316	1.39 (1.22, 1.58)	12,466	1.00 (0.99, 1.01)	2,881	0.86 (0.82, 0.90)	490	0.94 (0.84, 1.05)	72	1.08 (0.85, 1.37)	25	1.95 (1.31, 2.90)
√				3	274,575	21,085	5,823	1.40 (1.22, 1.60)	11,896	1.00 (0.99, 1.01)	2,798	0.86 (0.81, 0.91)	474	0.93 (0.83, 1.04)	70	1.06 (0.83, 1.37)	24	1.97 (1.30, 2.97)
√	√			3	274,575	21,085	5,823	1.36 (1.16, 1.58)	11,896	1.00 (0.99, 1.01)	2,798	0.87 (0.81, 0.94)	474	0.94 (0.83, 1.05)	70	1.06 (0.83, 1.37)	24	1.97 (1.30, 2.98)
√	√	√		3	218,549	6,002	1,644	1.27 (1.06, 1.52)	3,383	1.00 (0.99, 1.01)	809	0.93 (0.81, 1.07)	136	1.01 (0.85, 1.20)	24	1.38 (0.92, 2.07)	6	1.53 (0.68, 3.41)
√			√	3	217,862	14,267	3,491	1.36 (1.23, 1.50)	8,182	1.00 (*)	2,122	0.87 (0.81, 0.93)	390	0.93 (0.82, 1.04)	62	1.02 (0.61, 1.69)	20	1.97 (1.01, 3.83)
√		√	√	3	176,781	4,040	964	1.28 (1.11, 1.46)	2,306	1.00 (0.99, 1.01)	629	0.93 (0.80, 1.09)	114	0.99 (0.81, 1.19)	22	1.42 (0.93, 2.16)	5	1.57 (0.65, 3.79)

All analyses are standardised for baseline age and sex. Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).
Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).
*The penultimate analysis of the South Asian studies used standard CIs rather than floating absolute risks.

eTable 5: Six WHO BMI groups vs all-cause mortality, by successively stricter inclusion criteria, in the 189 studies contributing to all such analyses (including the strictest, which is the pre-specified primary analysis)

Exclude baseline chronic disease?	Adjust for smoking?	Exclude the first 5 years of follow-up?	Restrict analyses to never-smokers?	No of studies	No of partici-pants	No of deaths	Underweight (BMI 15 to <18.5)		Normal weight (18.5 to <25)		Overweight (25 to <30)		Obesity Grade I (30 to <35)		Obesity Grade II (35 to <40)		Obesity Grade III (40 to <60)	
							No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)	No of deaths	HR (95% CI)
				189	10,097,300	1,569,327	67,412	1.81 (1.72, 1.91)	796,151	1.00 (0.98, 1.02)	513,629	0.96 (0.95, 0.97)	141,514	1.18 (1.17, 1.19)	35,434	1.50 (1.47, 1.52)	15,187	1.96 (1.90, 2.02)
√				189	8,613,459	1,183,235	51,921	1.80 (1.70, 1.90)	618,867	1.00 (0.98, 1.02)	378,600	0.96 (0.95, 0.97)	99,695	1.18 (1.17, 1.20)	24,009	1.51 (1.48, 1.55)	10,143	2.04 (1.97, 2.12)
√	√			189	8,411,814	1,164,433	50,585	1.68 (1.58, 1.78)	609,250	1.00 (0.98, 1.02)	373,294	0.99 (0.98, 1.01)	97,958	1.25 (1.23, 1.27)	23,489	1.62 (1.58, 1.66)	9,857	2.21 (2.13, 2.30)
√	√	√		189	7,706,287	936,304	33,654	1.59 (1.49, 1.69)	491,157	1.00 (0.98, 1.02)	306,933	1.03 (1.01, 1.04)	78,567	1.31 (1.29, 1.32)	18,426	1.69 (1.66, 1.73)	7,567	2.34 (2.25, 2.44)
√			√	189	4,290,799	479,530	19,937	1.51 (1.43, 1.59)	240,089	1.00 (0.98, 1.02)	157,492	1.08 (1.07, 1.08)	45,628	1.39 (1.36, 1.42)	11,466	1.81 (1.76, 1.87)	4,918	2.52 (2.38, 2.66)
√		√	√	189	3,951,455	385,879	12,726	1.47 (1.39, 1.55)	192,523	1.00 (0.98, 1.02)	130,293	1.11 (1.10, 1.11)	37,318	1.44 (1.41, 1.47)	9,179	1.92 (1.86, 1.98)	3,840	2.71 (2.55, 2.86)

All analyses are standardised for baseline age and sex. Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 6: Six WHO BMI groups vs all-cause mortality, by baseline smoking status

	No of studies	No of participants	No of deaths	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
Never-smokers	98	440,289	45,480	1.53 (1.39, 1.68)	1.00 (0.96, 1.04)	1.07 (1.06, 1.07)	1.39 (1.33, 1.44)	1.86 (1.73, 1.99)	2.69 (2.43, 2.97)
Ex- and current smokers	98	564,671	97,853	1.86 (1.74, 1.99)	1.00 (0.97, 1.03)	0.94 (0.94, 0.95)	1.13 (1.09, 1.17)	1.51 (1.42, 1.61)	2.04 (1.85, 2.24)
P value for heterogeneity between HRs in never-smokers and others				0.0458		0.0003	<0.0001	0.0004	0.0003

Analyses excluded the first 5 years of follow-up and people without pre-existing chronic disease.

Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 7: Six WHO BMI groups vs all-cause mortality, using standard CIs, not floating absolute risks

	No of studies	No of participants	No of deaths	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
All studies	189	3,951,455	385,879	1.47 (1.40, 1.55)	Reference	1.11 (1.09, 1.13)	1.44 (1.40, 1.49)	1.92 (1.84, 2.00)	2.71 (2.54, 2.88)
Men	157	913,344	115,373	1.83 (1.66, 2.02)	Reference	1.12 (1.09, 1.15)	1.70 (1.62, 1.79)	2.68 (2.53, 2.84)	4.24 (3.77, 4.77)
Women	141	2,743,371	264,657	1.53 (1.45, 1.60)	Reference	1.08 (1.06, 1.11)	1.37 (1.32, 1.42)	1.86 (1.77, 1.95)	2.73 (2.55, 2.93)

Analyses excluded the first 5 years of follow-up, restricted to never-smokers without pre-existing chronic disease. Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

eTable 8: Nine BMI groups vs all-cause mortality, by geographic region

	Body-mass index (kg/m^2)								
	BMI 15 to <18.5	**18.5 to <20**	**20 to <22.5**	**22.5 to <25**	**25 to <27.5**	**27.5 to <30**	**30 to <35**	**35 to <40**	**40 to <60**
All geographic regions (189 studies; 3,951,455 participants; 385,879 deaths)									
No. participants / deaths	114091 / 12726	230749 / 20989	838907 / 72701	1075894/98833	821303 / 84952	428800 / 45341	330840 / 37318	80827 / 9179	30044 / 3840
HR (95% CI)	1.51 (1.43, 1.59)	1.13 (1.09, 1.17)	1.00 (0.98, 1.02)	1.00 (0.99, 1.01)	1.07 (1.07, 1.08)	1.20 (1.18, 1.22)	1.45 (1.41, 1.48)	1.94 (1.87, 2.01)	2.76 (2.60, 2.92)
I^2 (95% CI)	64% (58%, 69%)	43% (32%, 52%)	10% (0%, 25%)	.	11% (0%, 27%)	33% (20%, 44%)	53% (45%, 60%)	31% (17%, 42%)	36% (23%, 47%)
Europe (89 studies; 1,135,600 participants; 56,477 deaths)									
No. participants / deaths	13398 / 675	42584 / 1508	199369 / 7449	306566 / 13278	249929 / 12850	153147 / 8935	127536 / 8386	32749 / 2424	10322 / 972
HR (95% CI)	1.79 (1.63, 1.97)	1.25 (1.14, 1.38)	1.02 (0.97, 1.07)	1.00 (0.97, 1.03)	1.07 (1.06, 1.09)	1.21 (1.18, 1.25)	1.52 (1.45, 1.58)	1.99 (1.87, 2.12)	3.04 (2.84, 3.27)
I^2 (95% CI)	0% (0%, 26%)	23% (0%, 42%)	0% (0%, 26%)	.	5% (0%, 28%)	19% (0%, 39%)	51% (38%, 62%)	24% (0%, 42%)	0% (0%, 26%)
North America (40 studies; 1,415,087 participants; 219,922 deaths)									
No. participants / deaths	22028 / 3846	67114 / 8597	274883 / 36200	359022 / 54995	317721 / 53464	168183 / 28471	149807 / 25348	39379 / 6299	16950 / 2702
HR (95% CI)	1.51 (1.34, 1.70)	1.09 (1.02, 1.16)	1.01 (0.96, 1.06)	1.00 (0.97, 1.03)	1.06 (1.04, 1.07)	1.17 (1.12, 1.22)	1.39 (1.30, 1.49)	1.93 (1.74, 2.13)	2.58 (2.26, 2.93)
I^2 (95% CI)	40% (12%, 59%)	13% (0%, 41%)	6% (0%, 35%)	.	9% (0%, 38%)	55% (36%, 69%)	70% (59%, 78%)	65% (51%, 75%)	63% (48%, 74%)
Australia / NZ (11 studies; 149,602 participants; 4,656 deaths)									
No. participants / deaths	1592 / 63	4620 / 135	20698 / 530	35234 / 1027	34479 / 1121	23823 / 803	21070 / 717	5884 / 203	2202 / 57
HR (95% CI)	1.45 (1.12, 1.90)	1.29 (0.96, 1.74)	1.02 (0.91, 1.14)	1.00 (0.94, 1.06)	0.98 (0.93, 1.04)	1.11 (0.99, 1.25)	1.31 (1.20, 1.42)	1.81 (1.55, 2.11)	2.03 (1.49, 2.77)
I^2 (95% CI)	0% (0%, 60%)	28% (0%, 64%)	0% (0%, 60%)	.	0% (0%, 60%)	0% (0%, 60%)	0% (0%, 60%)	0% (0%, 60%)	0% (0%, 60%)
East Asia (46 studies; 1,074,385 participants; 100,784 deaths)									
No. participants / deaths	46979 / 7178	94409 / 10206	301242 / 27537	336758 / 28755	194857 / 17070	72133 / 6950	25658 / 2753	1941 / 231	408 / 104
HR (95% CI)	1.36 (1.25, 1.49)	1.11 (1.04, 1.18)	0.99 (0.97, 1.02)	1.00 (0.97, 1.03)	1.07 (1.04, 1.11)	1.28 (1.21, 1.35)	1.54 (1.42, 1.67)	2.01 (1.59, 2.54)	2.38 (1.33, 4.24)
I^2 (95% CI)	86% (82%, 89%)	67% (55%, 76%)	13% (0%, 40%)	.	19% (0%, 44%)	0% (0%, 34%)	24% (0%, 48%)	0% (0%, 34%)	7% (0%, 35%)
South Asia (3 studies; 176,781 participants; 4,040 deaths)									
No. participants / deaths	30094 / 964	22022 / 543	42715 / 985	38314 / 778	24317 / 447	11514 / 182	6769 / 114	874 / 22	162 / 5
HR (95% CI)	1.30 (1.10, 1.52)	1.08 (0.90, 1.29)	1.04 (0.96, 1.13)	1.00 (0.89, 1.13)	0.99 (0.83, 1.19)	0.94 (0.72, 1.24)	1.03 (0.85, 1.26)	1.44 (0.94, 2.20)	1.62 (0.67, 3.91)
I^2 (95% CI)	0% (0%, 90%)	54% (0%, 87%)	0% (0%, 90%)	.	45% (0%, 84%)	59% (0%, 88%)	0% (0%, 90%)	0% (0%, 90%)	0% (0%, 90%)

Analyses excluded the first 5 years of follow-up, and are restricted to never-smokers without pre-existing chronic disease.

Reference category is BMI 22.5 to <25 kg/m^2.

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 9: Six WHO BMI groups vs all-cause mortality, by geographic region

	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
Europe						
(89 studies; 1,135,600 participants; 56,477 deaths)						
No participants / deaths	13398 / 675	548519 / 22235	403076 / 21785	127536 / 8386	32749 / 2424	10322 / 972
HR (95% CI)	1.69 (1.56, 1.85)	1.00 (0.96, 1.04)	1.12 (1.11, 1.13)	1.51 (1.45, 1.56)	2.01 (1.87, 2.17)	3.00 (2.80, 3.22)
I^2 (95% CI)	0% (0%, 26%)	.	33% (13%, 49%)	60% (49%, 68%)	31% (9%, 47%)	0% (0%, 26%)
North America						
(40 studies; 1,415,087 participants; 219,922 deaths)						
No participants / deaths	22028 / 3846	701019 / 99792	485904 / 81935	149807 / 25348	39379 / 6299	16950 / 2702
HR (95% CI)	1.44 (1.33, 1.55)	1.00 (0.97, 1.03)	1.10 (1.08, 1.12)	1.40 (1.35, 1.44)	1.96 (1.84, 2.08)	2.64 (2.41, 2.88)
I^2 (95% CI)	37% (7%, 57%)	.	66% (53%, 76%)	80% (73%, 85%)	71% (61%, 79%)	69% (57%, 78%)
Australia / NZ						
(11 studies; 149,602 participants; 4656 deaths)						
No participants / deaths	1592 / 63	60552 / 1692	58302 / 1924	21070 / 717	5884 / 203	2202 / 57
HR (95% CI)	1.41 (1.10, 1.82)	1.00 (0.96, 1.04)	1.01 (0.93, 1.08)	1.28 (1.18, 1.40)	1.76 (1.53, 2.03)	2.11 (1.62, 2.74)
I^2 (95% CI)	0% (0%, 60%)	.	0% (0%, 60%)	0% (0%, 60%)	0% (0%, 60%)	0% (0%, 60%)
East Asia						
(46 studies; 1,074,385 participants; 100,784 deaths)						
No participants / deaths	46979 / 7178	732409 / 66498	266990 / 24020	25658 / 2753	1941 / 231	408 / 104
HR (95% CI)	1.40 (1.25, 1.57)	1.00 (0.97, 1.03)	1.12 (1.10, 1.14)	1.53 (1.43, 1.63)	1.71 (1.44, 2.03)	1.62 (1.26, 2.10)
I^2 (95% CI)	85% (81%, 89%)	.	53% (34%, 66%)	38% (11%, 57%)	0% (0%, 34%)	4% (0%, 30%)
South Asia						
(3 studies; 176,781 participants; 4040 deaths)						
No participants / deaths	30094 / 964	103051 / 2306	35831 / 629	6769 / 114	874 / 22	162 / 5
HR (95% CI)	1.28 (1.11, 1.46)	1.00 (0.99, 1.01)	0.93 (0.80, 1.09)	0.99 (0.81, 1.19)	1.42 (0.93, 2.16)	1.57 (0.65, 3.79)
I^2 (95% CI)	26% (0%, 92%)	.	35% (0%, 79%)	0% (0%, 90%)	0% (0%, 90%)	0% (0%, 90%)
P-value for heterogeneity by region	0.0526	-	0.3980	0.0152	0.5994	0.0005

Analyses excluded the first 5 years of follow-up, restricted to never-smokers without pre-existing chronic disease.

P-values for difference were calculated using multivariate meta-regression.

Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 10: Six WHO BMI groups vs all-cause mortality, by geographic region and by sex

	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
All geographic regions						
Men (157 studies; 913,344 participants; 115,373 deaths)						
No of participants / deaths	20172 / 2761	458050 / 54707	353791 / 46465	67782 / 9485	10640 / 1532	2909 / 423
HR (95% CI)	1.83 (1.66, 2.02)	1.00 (0.98, 1.02)	1.12 (1.11, 1.13)	1.70 (1.63, 1.77)	2.68 (2.54, 2.83)	4.24 (3.77, 4.76)
Women (141 studies; 2,743,371 participants; 264,657 deaths)						
No of participants / deaths	81728 / 9637	1513911 / 134546	819776 / 82231	239900 / 27393	63773 / 7524	24283 / 3326
HR (95% CI)	1.53 (1.44, 1.62)	1.00 (0.98, 1.02)	1.08 (1.07, 1.10)	1.37 (1.34, 1.40)	1.86 (1.79, 1.93)	2.73 (2.57, 2.91)
Europe						
Men (75 studies; 166,935 participants; 14,373 deaths)						
No of participants / deaths	761 / 93	72953 / 5412	76276 / 6743	14987 / 1832	1658 / 238	300 / 55
HR (95% CI)	2.17 (1.76, 2.68)	1.00 (0.96, 1.04)	1.17 (1.16, 1.18)	1.91 (1.77, 2.05)	3.38 (2.96, 3.86)	7.83 (5.93, 10.35)
Women (59 studies; 819,235 participants; 41,254 deaths)						
No of participants / deaths	8131 / 552	389654 / 16337	284478 / 14800	100031 / 6484	28045 / 2173	8896 / 908
HR (95% CI)	2.00 (1.67, 2.40)	1.00 (0.96, 1.04)	1.06 (1.04, 1.08)	1.31 (1.26, 1.37)	1.87 (1.73, 2.03)	2.92 (2.70, 3.17)
North America						
Men (30 studies;352,288 participants; 64,859 deaths)						
No of participants / deaths	1786 / 476	128348 / 24420	173053 / 31613	39832 / 6817	7168 / 1188	2101 / 345
HR (95% CI)	2.13 (1.70, 2.67)	1.00 (0.97, 1.03)	1.11 (1.10, 1.12)	1.55 (1.49, 1.61)	2.52 (2.29, 2.78)	3.72 (3.17, 4.37)
Women (33 studies; 946,179 participants; 150,583 deaths)						
No of participants / deaths	16220 / 3141	504025 / 72940	283505 / 49048	100226 / 18175	29015 / 5002	13188 / 2277
HR (95% CI)	1.49 (1.36, 1.65)	1.00 (0.96, 1.04)	1.09 (1.07, 1.11)	1.35 (1.31, 1.40)	1.91 (1.80, 2.03)	2.53 (2.35, 2.73)
Australia / NZ						
Men (11 studies; 55,340 participants; 2,141 deaths)						
No of participants	214 / 15	18309 / 731	27002 / 1016	7843 / 301	1543 / 66	429 / 12
HR (95% CI)	2.35 (1.40, 3.95)	1.00 (0.94, 1.06)	0.98 (0.82, 1.17)	1.36 (1.10, 1.69)	2.79 (2.17, 3.60)	4.46 (2.48, 8.02)
Women (9 studies; 88,284 participants; 2,450 deaths)						
No of participants	1251 / 47	38495 / 922	29697 / 888	12849 / 411	4245 / 137	1747 / 45
HR (95% CI)	1.91 (1.42, 2.58)	1.00 (0.95, 1.06)	1.00 (0.91, 1.10)	1.34 (1.19, 1.52)	1.58 (1.33, 1.88)	2.45 (1.82, 3.29)
East Asia						
Men (39 studies; 281,530 participants; 32,355 deaths)						
No of participants	9669 / 1831	201325 / 23132	66543 / 6850	3765 / 499	162 / 32	-
HR (95% CI)	1.45 (1.28, 1.65)	1.00 (0.96, 1.04)	1.12 (1.06, 1.17)	2.02 (1.71, 2.39)	3.12 (2.20, 4.43)	-
Women (37 studies; 778,840 participants; 68,006 deaths)						
No of participants	35868 / 5288	521018 / 43068	198358 / 17114	21568 / 2247	1716 / 198	-
HR (95% CI)	1.39 (1.30, 1.49)	1.00 (0.98, 1.02)	1.11 (1.08, 1.15)	1.56 (1.43, 1.71)	2.40 (1.89, 3.04)	-

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.
Reference category is WHO-defined normal weight (BMI value 18.5 to <25 kg/m^2).
CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).
Results for South Asia and highest BMI category in East Asia were not shown as there were too few events to estimate sex-specific HRs reliably.

eTable 11: Six WHO BMI groups vs all-cause mortality, by geographic region and baseline age

	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
All geographic regions						
Age 35-49 years (124 studies, 1,206,420 participants, 42,531 deaths)						
No of participants	42933 / 1214	749003 / 22615	323176 / 12958	68994 / 3947	16000 / 1162	6314 / 635
HR (95% CI)	1.46 (1.35, 1.58)	1.00 (0.96, 1.04)	1.20 (1.17, 1.24)	1.86 (1.79, 1.95)	2.86 (2.66, 3.09)	4.67 (4.27, 5.10)
Age 50-69 years (167 studies, 2,205,216 participants, 246,629 deaths)						
No of participants	47216 / 6424	1094744 / 117156	770657 / 87401	218503 / 26230	54459 / 6686	19637 / 2732
HR (95% CI)	1.56 (1.39, 1.75)	1.00 (0.98, 1.02)	1.11 (1.09, 1.12)	1.50 (1.46, 1.53)	2.16 (2.07, 2.26)	3.14 (2.95, 3.34)
Age 70-89 years (88 studies, 225,490 participants, 90,722 deaths)						
No of participants	11419 / 4744	118708 / 49413	72488 / 28297	18253 / 6682	3517 /1205	1105 / 381
HR (95% CI)	1.38 (1.30, 1.46)	1.00 (0.98, 1.02)	1.00 (0.98, 1.02)	1.19 (1.14, 1.23)	1.64 (1.48, 1.82)	1.75 (1.57, 1.95)
Europe						
Age 35-49 years (55 studies, 226,459 participants, 7752 deaths)						
No of participants	3002 / 80	124652 / 3469	75707 / 3000	18135 / 911	3861 / 220	1102 / 72
HR (95% CI)	1.86 (1.49, 2.33)	1.00 (0.94, 1.06)	1.17 (1.15, 1.20)	1.90 (1.72, 2.09)	3.01 (2.62, 3.46)	5.34 (4.20, 6.78)
Age 50-69 years (79 studies, 727,044 participants, 41,041 deaths)						
No of participants	5441 / 440	324186 / 15542	271692 / 15755	92792 / 6435	25028 / 2013	7905 / 856
HR (95% CI)	2.25 (1.97, 2.56)	1.00 (0.96, 1.04)	1.11 (1.07, 1.15)	1.60 (1.51, 1.70)	2.23 (2.06, 2.40)	4.04 (3.58, 4.55)
Age 70-89 years (28 studies, 23,613 participants, 6,775 deaths)						
No of participants	346 / 123	9714 / 2711	9804 / 2772	3056 / 957	575 / 177	118 / 35
HR (95% CI)	1.65 (1.31, 2.08)	1.00 (0.92, 1.09)	0.98 (0.93, 1.02)	1.12 (1.03, 1.21)	1.56 (1.25, 1.95)	1.91 (1.35, 2.71)
North America						
Age 35-49 years (26 studies, 390,431 participants, 19,811 deaths)						
No of participants	6560 / 299	217529 / 8799	116454 / 6623	35414 / 2647	9984 / 897	4490 / 546
HR (95% CI)	1.43 (1.20, 1.71)	1.00 (0.93, 1.07)	1.27 (1.26, 1.29)	1.85 (1.76, 1.95)	2.60 (2.28, 2.98)	4.01 (3.48, 4.63)
Age 50-69 years (36 studies, 794,285 participants, 139,428 deaths)						
No of participants	8820 / 1804	358849 / 59630	299389 / 54405	93372 / 17447	23861 / 4360	9994 / 1782
HR (95% CI)	1.39 (0.95, 2.05)	1.00 (0.97, 1.03)	1.13 (1.10, 1.16)	1.51 (1.47, 1.56)	2.15 (2.04, 2.28)	2.87 (2.68, 3.08)
Age 70-89 years (28 studies, 111,757 participants, 56,180 deaths)						
No of participants	2587 / 1514	55030 / 28920	40056 / 19625	11047 / 4896	2267 / 931	770 / 294
HR (95% CI)	1.45 (1.33, 1.58)	1.00 (0.98, 1.02)	0.99 (0.96, 1.02)	1.17 (1.12, 1.22)	1.71 (1.47, 1.98)	1.79 (1.54, 2.07)

Notes are at the end of eTable 11, on page 24.

eTable 11 (continued)

	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
Australia / NZ						
Age 35-49 years (6 studies, 28,449 participants, 275 deaths)						
No of participants	.	12629 / 121	10323 / 99	3593 / 38	1093 / 11	508 / 6
HR (95% CI)	.	1.00 (0.87, 1.15)	1.05 (0.77, 1.45)	1.76 (1.23, 2.51)	3.30 (1.56, 6.99)	4.63 (1.99, 10.77)
Age 50-69 years (9 studies, 89,893 participants, 2,522 deaths)						
No of participants	762 / 21	33345 / 815	36229 / 1082	14022 / 423	4050 / 146	1485 / 35
HR (95% CI)	3.47 (1.93, 6.24)	1.00 (0.91, 1.10)	1.05 (1.00, 1.11)	1.38 (1.16, 1.64)	2.05 (1.58, 2.66)	2.75 (1.90, 3.98)
Age 70-89 years (9 studies, 21,191participants, 1,782 deaths)						
No of participants	357 / 41	9056 / 711	8496 / 721	2593 / 248	535 / 46	154 / 15
HR (95% CI)	1.90 (1.15, 3.12)	1.00 (0.93, 1.08)	0.97 (0.89, 1.05)	1.31 (1.14, 1.51)	1.74 (1.19, 2.53)	2.14 (0.99, 4.64)
East Asia						
Age 35-49 years (34 studies, 465,574 participants, 14,070 deaths)						
No of participants	17568 / 698	338759 / 9862	100473 / 3140	8056 / 330	588 / 31	130 / 9
HR (95% CI)	1.60 (1.33, 1.91)	1.00 (0.93, 1.07)	1.24 (1.17, 1.31)	2.16 (1.85, 2.52)	3.49 (2.45, 4.98)	3.63 (1.88, 6.99)
Age 50-69 years (41 studies, 531,345participants, 61,511deaths)						
No of participants	22069 / 3691	341802 / 39963	150351 / 15789	15763 / 1859	1170 / 153	190 / 56
HR (95% CI)	1.39 (1.25, 1.54)	1.00 (0.98, 1.02)	1.11 (1.07, 1.16)	1.61 (1.46, 1.79)	2.27 (1.83, 2.82)	2.27 (1.61, 3.21)
Age 70-89 years (21 studies, 58,715participants, 24,728deaths)						
No of participants	5710 / 2716	38866 / 16353	12660 / 5020	1320 / 556	103 / 46	56 / 37
HR (95% CI)	1.30 (1.15, 1.47)	1.00 (0.98, 1.02)	1.00 (0.92, 1.08)	1.24 (1.13, 1.36)	1.51 (1.12, 2.05)	1.56 (1.11, 2.17)

Analyses excluded the first 5 years of follow-up, restricted to never-smokers without pre-existing chronic disease.

Reference categories are participants with normal weight (BMI 18.5 to <25 kg/m^2).

CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

Results for the lowest BMI category in Australia / NZ for baseline age 35-49 years were not shown because there were too few events to estimate age-specific HRs reliably.

Results for all BMI categories in South Asian studies were not shown because there were not enough events to estimate age-specific HRs reliably.

eTable 12: Population-attributable fractions (PAFs) for adult mortality associated with overweight and obesity

PAF = proportion of all adult mortality that would be avoided if the individuals who are overweight (BMI 25 to <30 kg/m^2) or obese (BMI 30 to ≤60 kg/m^2) had the mortality rates of those in the WHO-defined normal range of BMI (18.5 to <25 kg/m^2)

	(a) PAFs within the Global BMI Collaboration studies (with lower prevalences of adiposity than nowadays)			(b) PAFs using contemporary prevalence estimates and HRs from all regions*	
	HR (95% CI)	Within-study prevalence	Within-study PAF (%)	Contemporary prevalence	Contemporary PAF (%)
North America					
Overweight	1.10 (1.08, 1.12)	34%	3.0% (2.0%, 4.0%)	38%	3.2%
Obese	1.59 (1.55, 1.64)	15%	7.8% (7.1%, 8.5%)	31%	15.9%
Australia/New Zealand					
Overweight	1.01 (0.93, 1.08)	39%	0.2% (0.0%, 3.2%)	37%	3.3%
Obese	1.44 (1.34, 1.54)	19%	7.9% (6.0%, 9.8%)	25%	13.2%
Europe					
Overweight	1.12 (1.11, 1.13)	36%	3.6% (2.5%, 4.8%)	33%	3.0%
Obese	1.79 (1.74, 1.85)	15%	9.0% (8.2%, 9.9%)	20%	10.5%
East Asia					
Overweight	1.12 (1.10, 1.14)	25%	2.8% (1.8%, 3.7%)	19%	1.9%
Obese	1.55 (1.46, 1.64)	3%	1.3% (1.1%, 1.6%)	6%	2.8%

The hazard ratios (HRs) in this table involve comparisons versus the WHO-defined normal range (BMI 18.5 to <25.0 kg/m^2); comparisons vs the minimum-mortality range (BMI 20 to <25 kg/m^2) would increase these HRs only slightly (by ~0.01or 0.02).

HRs for all obesity were derived from the HRs in eTable 9 for obesity grade I, II and III, using inverse-variance weights.
Results for South Asia are not shown separately because there were too few events to estimate the obesity HR reliably.

* The HRs (and their 95% CIs) from our meta-analyses of all regions were 1.11 (1.10, 1.11) for overweight and 1.64 (1.61, 1.67) for obese.
The regional prevalences of overweight and of obesity are from the Global Burden of Metabolic Risk Factors for Chronic Diseases Collaboration (Stevens G, Singh G et al. National, regional, and global trends in adult overweight and obesity prevalences. Popn Health Metrics 2012;10(1):22).

eTable 13: All-cause mortality HR per 5 kg/m^2 higher BMI in the BMI range above 25 kg/m^2 overall; by sex; and by baseline age

	All regions	Europe	North America	East Asia	Australia / NZ	South Asia
Overall (both sexes, all ages)						
No. studies/participants/deaths	189 / 1691813 / 180630	89 / 573683 / 33567	40 / 692039 / 116284	46 / 294589 / 27004	11 / 85256 / 2844	3 / 43474 / 765
HR per 5 units of BMI (95% CI)	1.31 (1.29, 1.33)	1.39(1.34, 1.43)	1.29(1.26, 1.32)	1.39 (1.34, 1.44)	1.31 (1.27, 1.35)	1.13 (0.97, 1.30)
Male						
No. studies/participants/deaths	157 / 435097 / 57897	75 / 93227 / 8870	30 / 222154 / 39963	39 / 70470 / 7381	11 / 36384 / 1380	2 / 12354 / 280
HR per 5 units of BMI (95% CI)	1.51 (1.46, 1.56)	1.70 (1.54, 1.88)	1.43 (1.37, 1.50)	1.77 (1.68, 1.88)	1.51 (1.21, 1.90)	1.64 (1.05, 2.55)
Female						
No. studies/participants/deaths	141 / 1147732 / 120474	59 / 421450 / 24365	33 / 425934 / 74502	37 / 221642 / 19559	9 / 46791 / 1436	3 / 29716 / 471
HR per 5 units of BMI (95% CI)	1.30 (1.26, 1.33)	1.32 (1.26, 1.39)	1.28 (1.25, 1.32)	1.40 (1.29, 1.51)	1.29 (1.19, 1.40)	1.03 (0.84, 1.28)
Baseline age 35-49						
No. studies/participants/deaths	124 / 414484 / 18702	55 / 98805 / 4203	26 / 166342 / 10713	34 / 109117 / 3501	6 / 15009 / 148	3 / 24489 / 120
HR per 5 units of BMI (95% CI)	1.52 (1.47, 1.56)	1.61 (1.58, 1.63)	1.40 (1.37, 1.43)	1.78 (1.72, 1.83)	1.61 (1.41, 1.84)	1.71 (1.23, 2.37)
Baseline age 50-69						
No. studies/participants/deaths	167 / 1063262 / 123051	80 / 398391 / 25701	36 / 426616 / 77994	41 / 167284 / 17801	9 / 54301 / 1651	2 / 15900 / 450
HR per 5 units of BMI (95% CI)	1.37 (1.35, 1.39)	1.43 (1.37, 1.49)	1.34 (1.31, 1.37)	1.48 (1.45, 1.51)	1.33 (1.25, 1.41)	1.33 (0.95, 1.86)
Baseline age 70-89						
No. studies/participants/deaths	88 / 95332 / 36555	28 / 13553 / 3941	28 / 54140 / 25746	21 / 14083 / 5622	9 / 11620 / 1012	2 / 1719 / 182
HR per 5 units of BMI (95% CI)	1.21 (1.17, 1.25)	1.21 (1.15, 1.29)	1.20 (1.15, 1.26)	1.26 (1.14, 1.39)	1.39 (1.34, 1.45)	1.03 (0.82, 1.30)

Analyses excluded the first 5 years of follow-up, and are restricted to never-smokers without pre-existing chronic disease.

HRs per 5 units of BMI were estimated by inverse-variance-weighted regression of the pooled log HR on BMI in the BMI range 25 to 60 kg/m^2.

eTable 14: Cause-specific mortality HR per 5 kg/m^2 higher BMI in the BMI range above 25 kg/m^2, by geographic region

	All regions	Europe	North America	East Asia	Australia / NZ	South Asia
All causes						
No. studies/participants/deaths	189 / 1691813 / 180630	89 / 573683 / 33567	40 / 692039 / 116284	46 / 294589 / 27004	11 / 85256 / 2844	3 / 43474 / 765
HR per 5 units of BMI (95% CI)	1.31 (1.29, 1.33)	1.39 (1.34, 1.43)	1.29 (1.26, 1.32)	1.39 (1.34, 1.44)	1.31 (1.27, 1.35)	1.13 (0.97, 1.30)
Cardiovascular disease						
No. studies/participants/deaths	164 / 1483133 / 66435	79 / 563075 / 11025	37 / 666326 / 50814	35 / 123322 / 3455	10 / 84262 / 769	3 / 43474 / 324
HR per 5 units of BMI (95% CI)	1.49 (1.45, 1.53)	1.56 (1.54, 1.58)	1.38 (1.35, 1.41)	1.54 (1.39, 1.69)	1.46 (1.26, 1.70)	1.10 (0.83, 1.46)
Coronary heart disease						
No. studies/participants/deaths	124 / 1550175 / 30570	57 / 505350 / 5111	33 / 655408 / 23123	23 / 262007 / 1740	9 / 81859 / 397	2 / 42884 / 187
HR per 5 units of BMI (95% CI)	1.42 (1.35, 1.49)	1.53 (1.48, 1.59)	1.38 (1.32, 1.44)	1.67 (1.50, 1.85)	1.53 (1.20, 1.96)	1.12 (0.76, 1.65)
Stroke						
No. studies/participants/deaths	114 / 1530488 / 17229	44 / 488239 / 2644	30 / 650176 / 10202	31 / 267714 / 4090	7 / 78843 / 184	2 / 42884 / 88
HR per 5 units of BMI (95% CI)	1.42 (1.35, 1.50)	1.52 (1.35, 1.71)	1.28 (1.20, 1.38)	1.50 (1.31, 1.72)	1.49 (1.24, 1.80)	1.13 (0.87, 1.47)
Respiratory disease						
No. studies/participants/deaths	89 / 1411864 / 8321	31 / 462318 / 1209	27 / 626233 / 5645	24 / 263516 / 1315	5 / 16107 / 83	2 / 42884 / 52
HR per 5 units of BMI (95% CI)	1.38 (1.30, 1.47)	1.63 (1.51, 1.76)	1.32 (1.19, 1.46)	1.49 (1.17, 1.91)	1.56 (1.08, 2.27)	1.56 (0.84, 2.89)
Cancer						
No. studies/participants/deaths	160 / 1656763 / 50890	73 / 564704 / 13520	38 / 690850 / 28452	37 / 271341 / 7999	10 / 84262 / 813	2 / 42884 / 76
HR per 5 units of BMI (95% CI)	1.19 (1.18, 1.20)	1.21 (1.19, 1.23)	1.19 (1.15, 1.23)	1.25 (1.17, 1.33)	1.19 (1.12, 1.26)	0.87 (0.58, 1.30)

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

For Europe and North America, HRs per 5 units of BMI were estimated by inverse-variance-weighted regression of the pooled log HR on BMI in the BMI range 25 to <60 kg/m^2.

Elsewhere, there were too few events in the range 40 to 60 kg/m^2 to estimate HRs reliably, so the HRs per 5 units of BMI were estimated by inverse-variance-weighted regression of the pooled log HR on BMI in the more limited BMI range 25 to <40 kg/m^2.

eTable 15: Nine BMI groups vs cause-specific mortality, by geographic region

	No of studies	No of participants	No of deaths	Body-mass index (BMI, kg/m^2)								
				15 to <18.5	18.5 to <20	20 to <22.5	22.5 to <25	25 to <27.5	27.5 to <30	30 to <35	35 to <40	40 to <60
Cardiovascular disease												
All regions	164	3276962	127586	1.33 (1.20, 1.47)	1.14 (1.06, 1.22)	0.98 (0.94, 1.03)	1.00 (0.97, 1.03)	1.11 (1.09, 1.14)	1.35 (1.31, 1.40)	1.75 (1.67, 1.84)	2.73 (2.49, 2.99)	4.03 (3.48, 4.67)
Europe	79	1117915	16967	1.77 (1.52, 2.07)	1.16 (1.04, 1.30)	1.01 (0.93, 1.09)	1.00 (0.95, 1.05)	1.15 (1.10, 1.19)	1.40 (1.33, 1.47)	1.87 (1.76, 1.99)	2.99 (2.68, 3.34)	5.13 (4.53, 5.80)
North America	37	1345640	93086	1.27 (1.18, 1.37)	1.08 (1.01, 1.15)	0.97 (0.92, 1.02)	1.00 (0.97, 1.03)	1.12 (1.11, 1.13)	1.33 (1.28, 1.38)	1.64 (1.54, 1.73)	2.40 (2.15, 2.67)	3.25 (2.88, 3.67)
Australia / NZ	10	147994	1266	1.12 (0.55, 2.26)	1.35 (0.94, 1.93)	1.16 (0.95, 1.42)	1.00 (0.88, 1.13)	1.02 (0.91, 1.14)	1.10 (0.95, 1.28)	1.41 (1.21, 1.65)	2.62 (1.93, 3.56)	2.96 (1.40, 6.23)
East Asia	35	488632	14871	1.13 (1.00, 1.27)	1.02 (0.90, 1.15)	0.92 (0.85, 0.98)	1.00 (0.97, 1.03)	1.08 (1.02, 1.14)	1.35 (1.25, 1.46)	1.87 (1.60, 2.19)	2.36 (1.81, 3.06)	1.06 (0.75, 1.51)
Coronary heart disease												
All regions	124	3599426	54872	1.10 (1.04, 1.17)	0.95 (0.90, 1.01)	0.89 (0.84, 0.93)	1.00 (0.96, 1.04)	1.18 (1.15, 1.20)	1.45 (1.42, 1.49)	1.89 (1.78, 2.00)	2.61 (2.45, 2.79)	3.54 (3.23, 3.88)
Europe	57	1016359	7630	1.71 (1.31, 2.23)	1.11 (0.94, 1.31)	1.00 (0.90, 1.10)	1.00 (0.93, 1.08)	1.20 (1.14, 1.26)	1.51 (1.43, 1.61)	2.07 (1.89, 2.27)	2.88 (2.57, 3.23)	5.06 (4.26, 6.02)
North America	33	1328311	40213	1.16 (1.03, 1.31)	1.01 (0.91, 1.12)	0.85 (0.80, 0.91)	1.00 (0.95, 1.05)	1.18 (1.17, 1.20)	1.41 (1.32, 1.50)	1.83 (1.67, 2.01)	2.52 (2.21, 2.87)	3.29 (2.85, 3.79)
Australia / NZ	9	143673	648	1.80 (0.28, 11.42)	1.31 (0.81, 2.11)	1.11 (0.80, 1.53)	1.00 (0.83, 1.20)	1.00 (0.86, 1.18)	1.04 (0.85, 1.28)	1.33 (1.04, 1.69)	2.95 (2.04, 4.26)	2.77 (0.40, 19.3)
East Asia	23	941039	5630	0.94 (0.82, 1.07)	0.73 (0.64, 0.83)	0.84 (0.77, 0.91)	1.00 (0.95, 1.05)	1.07 (0.97, 1.18)	1.37 (1.23, 1.53)	2.04 (1.55, 2.68)	2.76 (1.73, 4.40)	1.66 (0.79, 3.48)
Stroke												
All regions	114	3580423	40084	1.38 (1.16, 1.65)	1.15 (1.04, 1.27)	1.01 (0.96, 1.07)	1.00 (0.97, 1.03)	1.05 (1.00, 1.10)	1.23 (1.15, 1.32)	1.49 (1.38, 1.60)	2.47 (2.10, 2.92)	3.28 (2.39, 4.49)
Europe	44	980210	4481	2.39 (1.82, 3.13)	1.45 (1.22, 1.73)	1.06 (0.96, 1.17)	1.00 (0.92, 1.09)	1.07 (0.99, 1.16)	1.12 (1.02, 1.23)	1.60 (1.39, 1.84)	3.12 (2.37, 4.10)	4.12 (3.19, 5.33)
North America	30	1320458	20897	1.65 (1.24, 2.21)	1.21 (1.04, 1.40)	1.09 (0.99, 1.19)	1.00 (0.94, 1.06)	1.03 (0.96, 1.11)	1.12 (1.03, 1.23)	1.22 (1.09, 1.37)	1.91 (1.61, 2.26)	2.48 (1.92, 3.20)
Australia / NZ	7	137292	308	4.41 (1.35, 14.40)	2.41 (1.15, 5.06)	1.16 (0.67, 1.99)	1.00 (0.72, 1.39)	0.91 (0.71, 1.16)	1.27 (0.94, 1.70)	1.35 (0.90, 2.03)	2.27 (1.07, 4.83)	5.42 (1.37, 21.5)
East Asia	31	972419	13962	1.03 (0.89, 1.21)	1.00 (0.92, 1.09)	0.93 (0.87, 1.00)	1.00 (0.98, 1.02)	1.11 (1.04, 1.18)	1.51 (1.38, 1.66)	1.71 (1.56, 1.89)	2.47 (1.84, 3.33)	1.36 (0.84, 2.19)
Respiratory disease												
All regions	89	3353331	21634	3.26 (2.75, 3.86)	1.73 (1.59, 1.88)	1.22 (1.17, 1.27)	1.00 (0.97, 1.03)	1.00 (0.96, 1.03)	1.10 (1.04, 1.15)	1.30 (1.22, 1.39)	2.03 (1.81, 2.27)	3.27 (2.78, 3.83)
Europe	31	923340	2238	5.99 (4.45, 8.08)	2.17 (1.76, 2.68)	1.44 (1.28, 1.63)	1.00 (0.89, 1.12)	0.97 (0.82, 1.14)	1.06 (0.94, 1.19)	1.49 (1.32, 1.68)	2.68 (2.16, 3.33)	4.51 (3.36, 6.07)
North America	27	1278649	11912	2.72 (2.19, 3.36)	1.43 (1.27, 1.62)	1.11 (1.04, 1.18)	1.00 (0.97, 1.03)	0.91 (0.84, 1.00)	1.07 (0.99, 1.15)	1.01 (0.89, 1.15)	1.52 (1.33, 1.74)	2.77 (2.29, 3.34)
Australia / NZ	5	27203	145	6.02 (2.26, 16.06)	3.81 (1.18, 12.3)	1.57 (0.91, 2.71)	1.00 (0.70, 1.44)	0.88 (0.60, 1.29)	1.34 (0.90, 1.98)	1.20 (0.63, 2.28)	2.86 (0.89, 9.16)	-
East Asia	24	954095	6961	2.42 (1.86, 3.15)	1.51 (1.32, 1.74)	1.16 (1.15, 1.17)	1.00 (0.90, 1.11)	1.00 (0.89, 1.12)	1.02 (0.84, 1.24)	1.47 (1.21, 1.79)	3.31 (1.77, 6.19)	1.78 (1.10, 2.88)
Cancer												
All regions	160	3839619	106066	1.11 (1.06, 1.17)	1.01 (0.97, 1.05)	0.96 (0.94, 0.98)	1.00 (0.99, 1.01)	1.05 (1.03, 1.07)	1.13 (1.10, 1.16)	1.28 (1.25, 1.32)	1.55 (1.48, 1.61)	1.90 (1.78, 2.03)
Europe	73	1121525	23545	1.24 (1.08, 1.43)	1.00 (0.92, 1.08)	1.00 (0.94, 1.07)	1.00 (0.97, 1.03)	1.02 (0.97, 1.08)	1.12 (1.08, 1.16)	1.22 (1.15, 1.29)	1.54 (1.43, 1.64)	1.97 (1.76, 2.21)
North America	38	1413407	54336	1.23 (1.08, 1.41)	1.02 (0.95, 1.09)	0.97 (0.93, 1.01)	1.00 (0.98, 1.02)	1.04 (1.01, 1.07)	1.13 (1.09, 1.18)	1.32 (1.26, 1.38)	1.59 (1.47, 1.73)	1.79 (1.63, 1.95)
Australia / NZ	10	147994	1292	1.33 (0.14, 12.71)	1.26 (0.88, 1.80)	0.97 (0.79, 1.18)	1.00 (0.89, 1.13)	1.07 (0.96, 1.19)	1.11 (0.91, 1.35)	1.34 (1.13, 1.59)	1.49 (1.11, 2.00)	3.92 (0.35, 43.7)
East Asia	37	986649	26567	1.06 (0.97, 1.16)	0.95 (0.89, 1.01)	0.92 (0.89, 0.94)	1.00 (0.97, 1.03)	1.09 (1.03, 1.15)	1.18 (1.09, 1.28)	1.41 (1.31, 1.51)	1.54 (1.17, 2.01)	1.06 (0.65, 1.74)

Analyses excluded the first 5 years of follow-up, restricted to never-smokers without pre-existing chronic disease.

Reference category is BMI 22.5 to <25 kg/m^2.

CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

Results for South Asia were not shown because there were too few events to estimate HRs reliably.

Results for respiratory disease for the highest BMI category in Australia / NZ were not shown because there were too few events to estimate HRs reliably.

eTable 16: Six WHO BMI groups vs cause-specific mortality, by geographic region

	No of studies	No of participants	No of deaths	Underweight (15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
Cardiovascular disease									
All geographic regions	164	3276962	127586	1.38 (1.29, 1.48)	1.00 (0.97, 1.03)	1.22 (1.20, 1.24)	1.77 (1.71, 1.84)	2.61 (2.46, 2.78)	3.72 (3.38, 4.10)
Europe	79	1117915	16967	1.79 (1.54, 2.09)	1.00 (0.94, 1.06)	1.26 (1.24, 1.29)	1.93 (1.81, 2.06)	3.08 (2.77, 3.42)	5.31 (4.69, 6.02)
North America	37	1345640	93086	1.28 (1.18, 1.39)	1.00 (0.96, 1.04)	1.21 (1.20, 1.22)	1.66 (1.57, 1.75)	2.45 (2.21, 2.73)	3.25 (2.88, 3.66)
Australia / NZ	10	147994	1266	1.07 (0.58, 2.00)	1.00 (0.90, 1.12)	0.99 (0.92, 1.07)	1.30 (1.05, 1.63)	2.38 (1.70, 3.32)	2.90 (1.57, 5.33)
East Asia	35	488632	14871	1.16 (1.05, 1.28)	1.00 (0.99, 1.01)	1.18 (1.10, 1.27)	1.92 (1.60, 2.30)	2.40 (1.85, 3.13)	1.08 (0.76, 1.54)
Coronary heart disease									
All geographic regions	124	3599426	54872	1.17 (1.09, 1.24)	1.00 (0.96, 1.04)	1.34 (1.32, 1.35)	2.02 (1.91, 2.13)	2.81 (2.63, 3.01)	3.81 (3.47, 4.17)
Europe	57	1016359	7630	1.75 (1.34, 2.28)	1.00 (0.93, 1.07)	1.33 (1.29, 1.37)	2.12 (1.94, 2.33)	2.94 (2.62, 3.30)	5.15 (4.33, 6.12)
North America	33	1328311	40213	1.21 (1.06, 1.38)	1.00 (0.95, 1.06)	1.35 (1.34, 1.35)	1.96 (1.80, 2.12)	2.68 (2.37, 3.02)	3.46 (3.03, 3.94)
Australia / NZ	9	143673	648	1.64 (0.48, 5.64)	1.00 (0.79, 1.27)	1.01 (0.96, 1.06)	1.30 (0.97, 1.73)	2.88 (1.94, 4.28)	2.43 (0.68, 8.70)
East Asia	23	941039	5630	1.08 (0.96, 1.21)	1.00 (0.95, 1.05)	1.31 (1.24, 1.39)	2.49 (1.87, 3.30)	3.01 (1.89, 4.81)	1.84 (0.87, 3.87)
Stroke									
All geographic regions	114	3580423	40084	1.37 (1.23, 1.53)	1.00 (0.96, 1.04)	1.11 (1.09, 1.14)	1.46 (1.39, 1.54)	2.11 (1.93, 2.30)	2.33 (2.05, 2.65)
Europe	44	980210	4481	2.43 (1.84, 3.22)	1.00 (0.91, 1.10)	1.08 (1.06, 1.10)	1.59 (1.41, 1.79)	3.25 (2.43, 4.34)	4.02 (3.15, 5.13)
North America	30	1320458	20897	1.34 (1.17, 1.53)	1.00 (0.96, 1.04)	1.03 (0.99, 1.07)	1.23 (1.13, 1.34)	1.72 (1.52, 1.95)	1.98 (1.69, 2.31)
Australia / NZ	7	137292	308	3.59 (1.22, 10.6)	1.00 (0.66, 1.51)	0.97 (0.91, 1.03)	1.29 (0.88, 1.89)	1.97 (0.97, 3.97)	3.58 (0.84, 15.2)
East Asia	31	972419	13962	1.04 (0.90, 1.22)	1.00 (0.95, 1.05)	1.24 (1.17, 1.31)	1.72 (1.57, 1.88)	2.51 (1.86, 3.37)	1.37 (0.85, 2.21)
Respiratory disease									
All geographic regions	89	3353331	21634	2.73 (2.31, 3.23)	1.00 (0.99, 1.01)	0.90 (0.87, 0.94)	1.16 (1.08, 1.24)	1.79 (1.60, 1.99)	2.85 (2.43, 3.34)
Europe	31	923340	2238	4.70 (3.53, 6.26)	1.00 (0.95, 1.06)	0.87 (0.79, 0.96)	1.26 (1.08, 1.48)	2.21 (1.70, 2.88)	3.85 (2.86, 5.17)
North America	27	1278649	11912	2.41 (1.86, 3.12)	1.00 (0.93, 1.07)	0.89 (0.88, 0.91)	0.98 (0.90, 1.07)	1.46 (1.29, 1.66)	2.58 (2.12, 3.15)
Australia / NZ	5	27203	145	5.16 (1.94, 13.7)	1.00 (0.76, 1.31)	0.89 (0.69, 1.16)	1.03 (0.56, 1.90)	2.40 (0.74, 7.71)	-
East Asia	24	954095	6961	2.12 (1.59, 2.84)	1.00 (0.98, 1.02)	0.87 (0.79, 0.96)	1.31 (1.09, 1.56)	2.96 (1.59, 5.50)	1.61 (1.00, 2.60)
Cancer									
All geographic regions	160	3839619	106066	1.10 (1.05, 1.16)	1.00 (0.98, 1.02)	1.10 (1.09, 1.12)	1.31 (1.28, 1.34)	1.57 (1.50, 1.63)	1.96 (1.83, 2.09)
Europe	73	1121525	23545	1.26 (1.09, 1.46)	1.00 (0.96, 1.04)	1.07 (1.04, 1.10)	1.24 (1.19, 1.29)	1.55 (1.44, 1.67)	1.99 (1.77, 2.23)
North America	38	1413407	54336	1.23 (1.07, 1.41)	1.00 (0.97, 1.03)	1.09 (1.06, 1.12)	1.33 (1.27, 1.38)	1.64 (1.51, 1.77)	1.85 (1.70, 2.01)
Australia / NZ	10	147994	1292	1.48 (0.40, 5.44)	1.00 (0.90, 1.11)	1.09 (0.98, 1.22)	1.37 (1.15, 1.63)	1.50 (1.12, 2.03)	2.73 (0.74, 10.2)
East Asia	37	986649	26567	1.11 (1.02, 1.20)	1.00 (0.97, 1.03)	1.15 (1.09, 1.21)	1.47 (1.37, 1.57)	1.60 (1.22, 2.10)	1.13 (0.69, 1.85)

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.
Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).
Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).
Results for South Asia are not shown because there were too few events to estimate HRs reliably.
Results for respiratory disease in the highest BMI category in Australia / NZ are not shown as there were too few events to estimate HRs reliably.

eTable 17: Nine BMI groups vs all-cause mortality, (a) using fixed effect methods or (b) restricting follow-up to 5-15 years

	No of studies	No of participants	No of deaths	Body-mass index (kg/m^2)								
				15 to <18.5	18.5 to <20	20 to <22.5	22.5 to <25	25 to <27.5	27.5 to <30	30 to <35	35 to <40	40 to <60
(a) Using fixed effect meta-analyses												
All geographic regions	189	3,951,455	385,879	1.36 (1.34, 1.39)	1.07 (1.05, 1.08)	0.98 (0.98, 0.99)	1.00 (0.99, 1.01)	1.08 (1.07, 1.09)	1.24 (1.22, 1.25)	1.45 (1.44, 1.47)	1.91 (1.87, 1.95)	2.66 (2.57, 2.74)
Europe	89	1,135,600	56,477	1.70 (1.58, 1.84)	1.16 (1.10, 1.22)	1.04 (1.02, 1.06)	1.00 (0.98, 1.02)	1.06 (1.04, 1.08)	1.19 (1.17, 1.22)	1.43 (1.40, 1.46)	1.87 (1.80, 1.95)	2.88 (2.71, 3.07)
North America	40	1,415,087	219,922	1.29 (1.25, 1.33)	1.04 (1.02, 1.06)	0.97 (0.96, 0.98)	1.00 (0.99, 1.01)	1.09 (1.08, 1.10)	1.25 (1.24, 1.27)	1.46 (1.45, 1.48)	1.94 (1.89, 1.98)	2.66 (2.56, 2.76)
Australia / NZ	11	149,602	4,656	1.45 (1.12, 1.86)	1.30 (1.10, 1.54)	1.03 (0.95, 1.13)	1.00 (0.94, 1.06)	0.99 (0.93, 1.05)	1.11 (1.04, 1.19)	1.30 (1.21, 1.40)	1.79 (1.56, 2.06)	2.15 (1.65, 2.79)
East Asia	46	1,074,385	100,784	1.37 (1.34, 1.41)	1.08 (1.05, 1.10)	0.99 (0.97, 1.00)	1.00 (0.99, 1.01)	1.07 (1.06, 1.09)	1.24 (1.21, 1.27)	1.49 (1.43, 1.55)	1.78 (1.56, 2.03)	1.37 (1.13, 1.66)
South Asia	3	176,781	4,040	1.30 (1.22, 1.38)	1.06 (0.98, 1.16)	1.02 (0.96, 1.08)	1.00 (0.93, 1.07)	0.98 (0.89, 1.08)	0.90 (0.78, 1.04)	1.00 (0.83, 1.21)	1.45 (0.95, 2.20)	1.60 (0.66, 3.86)
(b) Restricting follow-up to 5-15 years												
All geographic regions	187	3,949,650	231,712	1.53 (1.45, 1.62)	1.15 (1.11, 1.19)	1.01 (0.99, 1.03)	1.00 (0.99, 1.01)	1.05 (1.04, 1.06)	1.19 (1.17, 1.21)	1.43 (1.39, 1.46)	1.90 (1.82, 1.98)	2.64 (2.50, 2.80)
Europe	88	1,134,616	45,383	1.98 (1.79, 2.19)	1.32 (1.18, 1.48)	1.03 (0.97, 1.09)	1.00 (0.97, 1.03)	1.06 (1.04, 1.08)	1.18 (1.15, 1.21)	1.46 (1.40, 1.53)	1.94 (1.82, 2.06)	3.02 (2.78, 3.27)
North America	39	1,414,292	103,616	1.53 (1.42, 1.64)	1.12 (1.06, 1.17)	1.01 (0.99, 1.04)	1.00 (0.99, 1.01)	1.05 (1.02, 1.07)	1.18 (1.13, 1.23)	1.40 (1.34, 1.47)	1.88 (1.75, 2.03)	2.55 (2.31, 2.82)
Australia / NZ	11	149,576	4,004	1.48 (1.13, 1.94)	1.41 (1.13, 1.76)	1.04 (0.93, 1.17)	1.00 (0.94, 1.07)	1.00 (0.93, 1.08)	1.13 (0.99, 1.28)	1.41 (1.28, 1.56)	1.88 (1.60, 2.21)	2.30 (1.75, 3.01)
East Asia	46	1,074,385	74,669	1.37 (1.24, 1.52)	1.09 (1.04, 1.15)	0.99 (0.97, 1.02)	1.00 (0.97, 1.03)	1.06 (1.03, 1.09)	1.26 (1.21, 1.32)	1.49 (1.40, 1.60)	1.89 (1.63, 2.19)	1.36 (1.02, 1.80)
South Asia	3	176,781	4,040	1.30 (1.10, 1.52)	1.08 (0.90, 1.29)	1.04 (0.96, 1.13)	1.00 (0.89, 1.13)	0.99 (0.83, 1.19)	0.94 (0.72, 1.24)	1.03 (0.85, 1.26)	1.44 (0.94, 2.20)	1.62 (0.67, 3.91)

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

Reference categories are BMI 22.5 to <25 kg/m^2.

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 18: Six WHO BMI groups vs all-cause mortality, (a) using fixed effect methods or (b) restricting follow-up to 5-15 years

	No of studies	No of participants	No of deaths	Underweight (15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
(a) Using fixed effect meta-analyses									
All geographic regions	189	3,951,455	385,879	1.36 (1.34, 1.39)	1.00 (1.00, 1.00)	1.13 (1.13, 1.14)	1.45 (1.44, 1.47)	1.91 (1.87, 1.95)	2.66 (2.57, 2.74)
Europe	89	1,135,600	56,477	1.67 (1.55, 1.80)	1.00 (0.99, 1.01)	1.09 (1.07, 1.10)	1.40 (1.37, 1.43)	1.84 (1.76, 1.91)	2.83 (2.65, 3.01)
North America	40	1,415,087	219,922	1.30 (1.26, 1.34)	1.00 (0.99, 1.01)	1.16 (1.15, 1.16)	1.48 (1.46, 1.50)	1.95 (1.90, 2.00)	2.68 (2.58, 2.79)
Australia / NZ	11	149,602	4,656	1.41 (1.10, 1.82)	1.00 (0.95, 1.05)	1.01 (0.97, 1.06)	1.27 (1.18, 1.37)	1.75 (1.52, 2.01)	2.09 (1.61, 2.72)
East Asia	46	1,074,385	100,784	1.37 (1.33, 1.40)	1.00 (0.99, 1.01)	1.11 (1.10, 1.13)	1.48 (1.43, 1.54)	1.77 (1.56, 2.02)	1.36 (1.12, 1.65)
South Asia	3	176,781	4,040	1.27 (1.19, 1.35)	1.00 (0.96, 1.04)	0.93 (0.86, 1.01)	0.98 (0.82, 1.18)	1.42 (0.93, 2.15)	1.57 (0.65, 3.78)
(b) Restricting follow-up to 5-15 years									
All geographic regions	187	3,949,650	231,712	1.49 (1.41, 1.58)	1.00 (0.98, 1.02)	1.08 (1.07, 1.09)	1.42 (1.38, 1.45)	1.87 (1.80, 1.95)	2.60 (2.45, 2.75)
Europe	88	1,134,616	45,383	1.82 (1.68, 1.99)	1.00 (0.97, 1.04)	1.10 (1.10, 1.11)	1.46 (1.40, 1.53)	1.92 (1.79, 2.06)	2.95 (2.72, 3.19)
North America	39	1,414,292	103,616	1.50 (1.39, 1.62)	1.00 (0.97, 1.03)	1.08 (1.06, 1.10)	1.39 (1.34, 1.44)	1.87 (1.74, 2.01)	2.53 (2.30, 2.78)
Australia / NZ	11	149,576	4,004	1.42 (1.09, 1.86)	1.00 (0.96, 1.05)	1.01 (0.95, 1.09)	1.35 (1.23, 1.48)	1.79 (1.54, 2.08)	2.24 (1.71, 2.93)
East Asia	46	1,074,385	74,669	1.36 (1.22, 1.52)	1.00 (0.96, 1.04)	1.11 (1.10, 1.12)	1.50 (1.41, 1.58)	1.86 (1.60, 2.16)	1.35 (1.02, 1.79)
South Asia	3	176,781	4,040	1.28 (1.11, 1.46)	1.00 (0.99, 1.01)	0.93 (0.80, 1.09)	0.99 (0.81, 1.19)	1.42 (0.93, 2.16)	1.57 (0.65, 3.79)

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 19: Effects of adjustment for race, or of exclusion of diabetes at baseline, in studies that could do this

	No of studies	No of participants	No of deaths	Underweight (15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
Adjustment for race									
Not adjusted for race	68	205478	23087	1.69 (1.50, 1.90)	1.00 (0.95, 1.05)	1.05 (1.05, 1.06)	1.34 (1.26, 1.43)	1.82 (1.66, 2.00)	2.64 (2.32, 3.00)
Adjusted for race	68	205478	23087	1.69 (1.50, 1.90)	1.00 (0.95, 1.05)	1.05 (1.04, 1.06)	1.33 (1.25, 1.41)	1.80 (1.64, 1.97)	2.60 (2.28, 2.95)
P value for heterogeneity				0.988	-	0.963	0.894	0.868	0.876
Exclusion of baseline diabetes									
Including diabetes	100	441577	45509	1.53 (1.39, 1.68)	1.00 (0.96, 1.04)	1.07 (1.06, 1.07)	1.39 (1.33, 1.45)	1.85 (1.73, 1.99)	2.68 (2.42, 2.97)
Excluding diabetes	100	429264	42693	1.55 (1.40, 1.71)	1.00 (0.96, 1.04)	1.07 (1.06, 1.07)	1.36 (1.30, 1.42)	1.78 (1.67, 1.90)	2.66 (2.42, 2.92)
P value for heterogeneity				0.893	-	0.980	0.765	0.800	0.765

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 20: Six WHO BMI groups vs all-cause mortality, in studies with full baseline data on heart disease, stroke & cancer

	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
19 studies; 820,301 participants; 40,205 deaths						
No. of participants /deaths	13589 / 1221	425611 / 19522	267626 / 12880	82213 / 4427	23036 / 1464	8226 / 691
HR (95% CI)	1.56 (1.37, 1.78)	1.00 (0.95, 1.06)	1.09 (1.04, 1.13)	1.40 (1.31, 1.50)	1.75 (1.60, 1.91)	2.51 (2.09, 3.00)

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eTable 21: Six WHO BMI groups vs cause-specific mortality, by year of baseline survey

	No of studies	No of participants	No of deaths	Underweight (15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
All studies									
BMI recorded <1990	113	1,054,589	115,745	1.43 (1.34, 1.53)	1.00 (0.98, 1.02)	1.14 (1.14, 1.15)	1.58 (1.52, 1.64)	2.10 (1.98, 2.23)	2.88 (2.57, 3.22)
BMI recorded ≥1990	76	2,896,866	270,134	1.53 (1.40, 1.67)	1.00 (0.97, 1.03)	1.05 (1.03, 1.07)	1.31 (1.29, 1.33)	1.76 (1.67, 1.84)	2.49 (2.35, 2.64)
P-value for heterogeneity				0.27		<0.001	<0.001	<0.001	0.070
European studies									
BMI recorded <1990	58	335,001	23,812	1.39 (1.22, 1.58)	1.00 (0.95, 1.05)	1.13 (1.12, 1.15)	1.63 (1.53, 1.74)	2.09 (1.90, 2.30)	3.00 (2.63, 3.43)
BMI recorded ≥1990	31	800,599	32,665	1.88 (1.70, 2.07)	1.00 (0.94, 1.06)	1.08 (1.08, 1.08)	1.33 (1.27, 1.40)	1.88 (1.73, 2.05)	2.88 (2.59, 3.21)
P-value for heterogeneity				0.001		0.177	0.010	0.217	0.437
North American studies									
BMI recorded <1990	25	547,820	61,764	1.38 (1.25, 1.52)	1.00 (0.96, 1.04)	1.12 (1.10, 1.14)	1.49 (1.40, 1.58)	2.13 (1.96, 2.32)	3.01 (2.60, 3.48)
BMI recorded ≥1990	15	867,267	158,158	1.60 (1.29, 1.99)	1.00 (0.92, 1.08)	1.05 (1.00, 1.10)	1.26 (1.25, 1.28)	1.66 (1.53, 1.81)	2.17 (1.98, 2.37)
P-value for heterogeneity				0.601		0.045	0.002	0.001	0.006
Australia/New Zealand									
BMI recorded <1990	5	13,825	1,237	1.37 (0.79, 2.37)	1.00 (0.95, 1.06)	0.98 (0.87, 1.10)	1.41 (0.95, 2.09)	1.57 (1.08, 2.30)	1.00 (0.31, 3.26)
BMI recorded ≥1990	6	135,777	3,419	1.49 (1.11, 2.01)	1.00 (0.93, 1.07)	1.03 (0.95, 1.13)	1.29 (1.19, 1.39)	1.77 (1.40, 2.25)	2.22 (1.68, 2.93)
P-value for heterogeneity				0.679		0.651	0.922	0.805	0.178
East Asian studies									
BMI recorded <1990	25	157,943	28,932	1.25 (1.12, 1.40)	1.00 (0.99, 1.01)	1.15 (1.11, 1.18)	1.73 (1.48, 2.03)	1.38 (1.06, 1.81)	1.01 (0.80, 1.27)
BMI recorded >1990	21	916,442	71,852	1.47 (1.28, 1.70)	1.00 (0.93, 1.07)	1.09 (1.08, 1.10)	1.41 (1.34, 1.49)	1.90 (1.64, 2.21)	2.65 (1.87, 3.76)
P-value for heterogeneity				0.157		0.036	0.022	0.079	<0.001

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

Studies were grouped according to median year of baseline survey (see eTable 1). All studies from South Asia began recruitment after 1990.

P-values for heterogeneity were calculated using multivariate meta-regression.

eTable 22: Six WHO BMI groups vs all-cause mortality, by method of assessing BMI

	No of studies	No of participants	No of deaths	Underweight (15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
All geographic regions									
Measured BMI	153	1,743,551	129,028	1.52 (1.41, 1.64)	1.00 (0.97, 1.03)	1.09 (1.09, 1.10)	1.44 (1.40, 1.49)	1.92 (1.81, 2.04)	2.79 (2.56, 3.04)
Self-reported BMI	36	2,207,904	256,851	1.38 (1.28, 1.48)	1.00 (0.98, 1.02)	1.13 (1.11, 1.14)	1.47 (1.42, 1.51)	2.00 (1.90, 2.12)	2.68 (2.42, 2.96)
p-values for heterogeneity				0.304		0.054	0.340	0.370	0.819
Europe									
Measured BMI	85	588,960	33,025	1.52 (1.37, 1.69)	1.00 (0.96, 1.04)	1.11 (1.09, 1.12)	1.53 (1.46, 1.60)	1.98 (1.84, 2.13)	3.07 (2.76, 3.41)
Self-reported BMI	4	546,640	23,452	1.83 (1.57, 2.13)	1.00 (0.99, 1.01)	1.21 (1.01, 1.44)	1.36 (1.07, 1.72)	2.72 (1.70, 4.34)	2.46 (2.11, 2.88)
p-values for heterogeneity				0.003		0.525	0.864	0.547	0.851
North America									
Measured BMI	20	86,010	12,868	1.74 (1.43, 2.12)	1.00 (0.92, 1.09)	1.00 (0.97, 1.04)	1.21 (1.11, 1.32)	1.72 (1.48, 1.99)	2.28 (1.82, 2.86)
Self-reported BMI	20	1,329,077	207,054	1.34 (1.26, 1.43)	1.00 (0.98, 1.02)	1.14 (1.12, 1.16)	1.51 (1.45, 1.57)	2.08 (1.94, 2.24)	2.88 (2.61, 3.17)
p-values for heterogeneity				0.002		0.004	<0.001	0.037	0.057
East Asia									
Measured BMI	35	844,914	75,444	1.44 (1.24, 1.67)	1.00 (0.95, 1.05)	1.14 (1.11, 1.17)	1.55 (1.41, 1.70)	1.78 (1.50, 2.12)	2.62 (1.83, 3.73)
Self-reported BMI	11	229,471	25,340	1.28 (1.14, 1.43)	1.00 (0.99, 1.01)	1.09 (1.02, 1.16)	1.53 (1.34, 1.75)	1.80 (1.25, 2.60)	1.29 (0.88, 1.89)
p-values for heterogeneity				0.445		0.377	0.643	0.834	<0.001

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

Reference category is participants with WHO-defined normal weight (BMI value between 18.5 and <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

P-values for heterogeneity were calculated using multivariate meta-regression.

Results from Australia / NZ and South Asia are not shown, as all but one study used measured BMI.

eTable 23: Six WHO BMI groups vs all-cause mortality, by population source (occupational or population based)

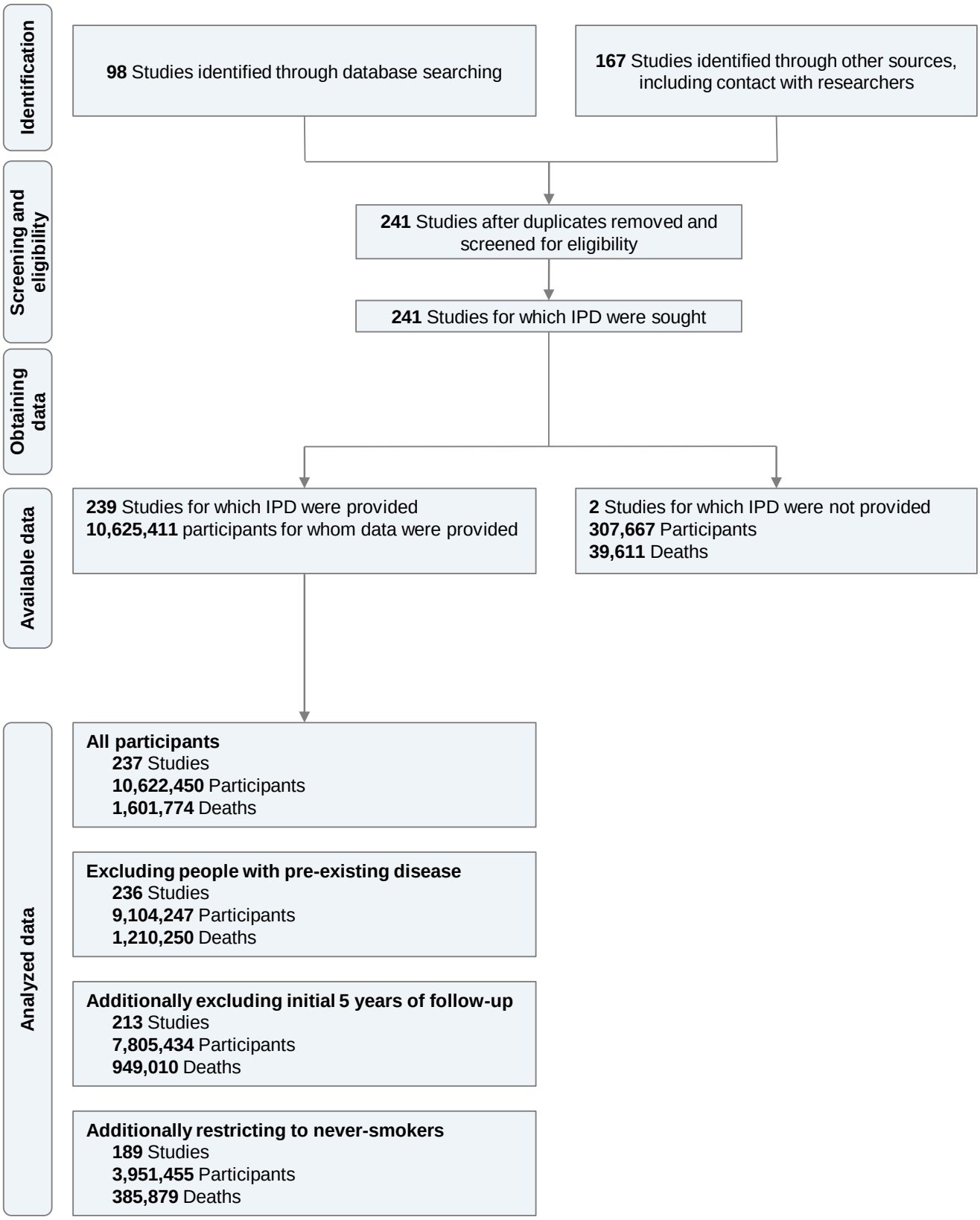
	Underweight (BMI 15 to <18.5)	Normal weight (18.5 to <25)	Overweight (25 to <30)	Obesity Grade I (30 to <35)	Obesity Grade II (35 to <40)	Obesity Grade III (40 to <60)
Occupational studies (30 studies; 397,442 participants; 24,976 deaths)						
No of participants / deaths	8294 / 301	216071 / 11098	121152 / 9384	37223 / 3040	10345 / 786	4357 / 367
HR (95% CI)	1.32 (1.15, 1.53)	1.00 (0.95, 1.05)	1.19 (1.14, 1.24)	1.68 (1.57, 1.80)	2.22 (2.04, 2.41)	3.31 (2.99, 3.67)
Approximately population-based studies (159 studies, 3,554,013 participants; 360,903 deaths)						
No of participants / deaths	105797 / 12425	1929479 / 181425	1128951 / 120909	293617 / 34278	70482 / 8393	25687 / 3473
HR (95% CI)	1.48 (1.40, 1.57)	1.00 (0.98, 1.02)	1.09 (1.09, 1.10)	1.40 (1.37, 1.43)	1.86 (1.78, 1.94)	2.60 (2.43, 2.78)
P-value for heterogeneity	0.458	.	0.002	<0.001	0.007	0.003

Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

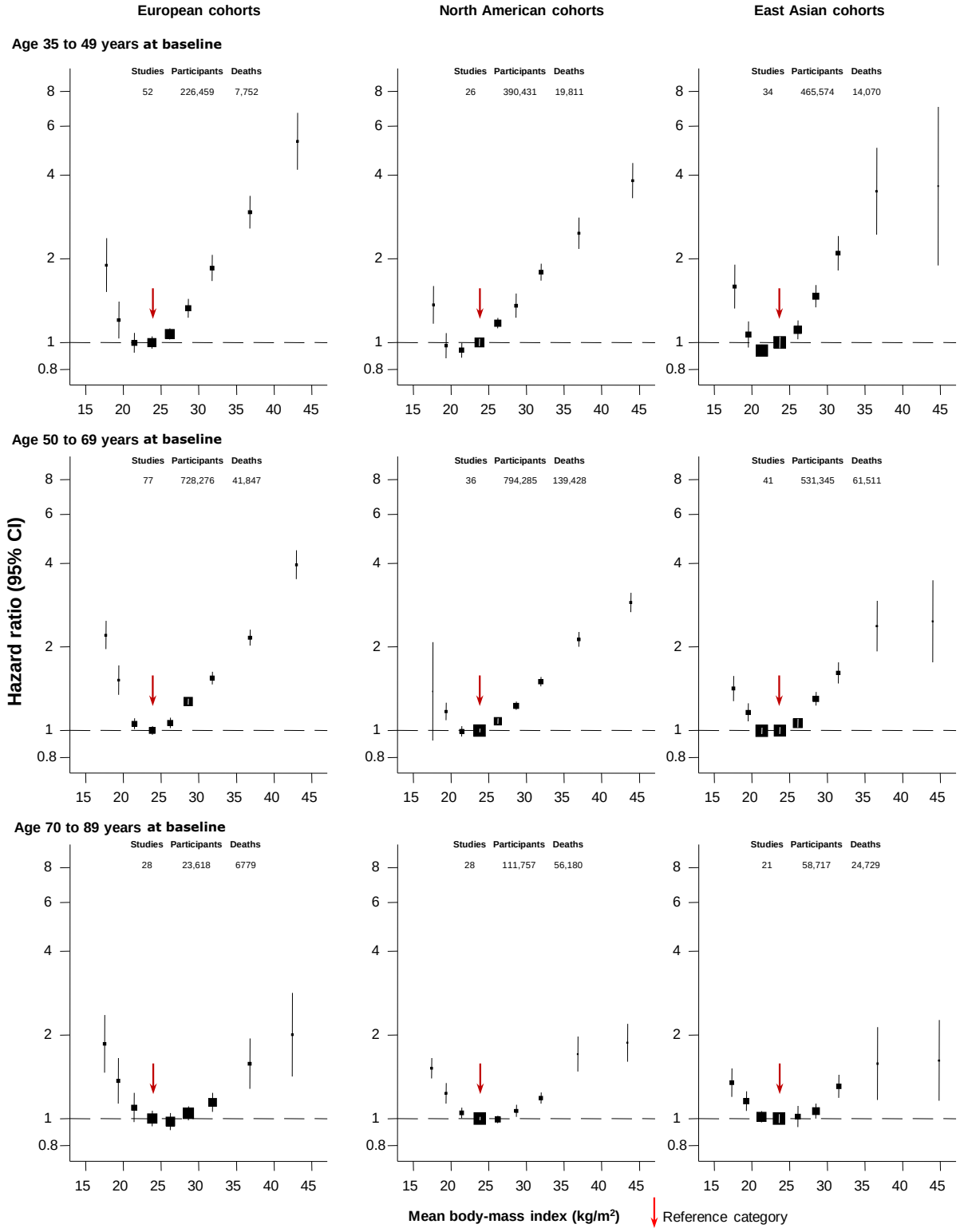
Reference category is WHO-defined normal weight (BMI 18.5 to <25 kg/m^2).

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

eFigure 1. Flow diagram



eFigure 2: 9 BMI categories vs all-cause mortality, by baseline age & 3 geographic regions

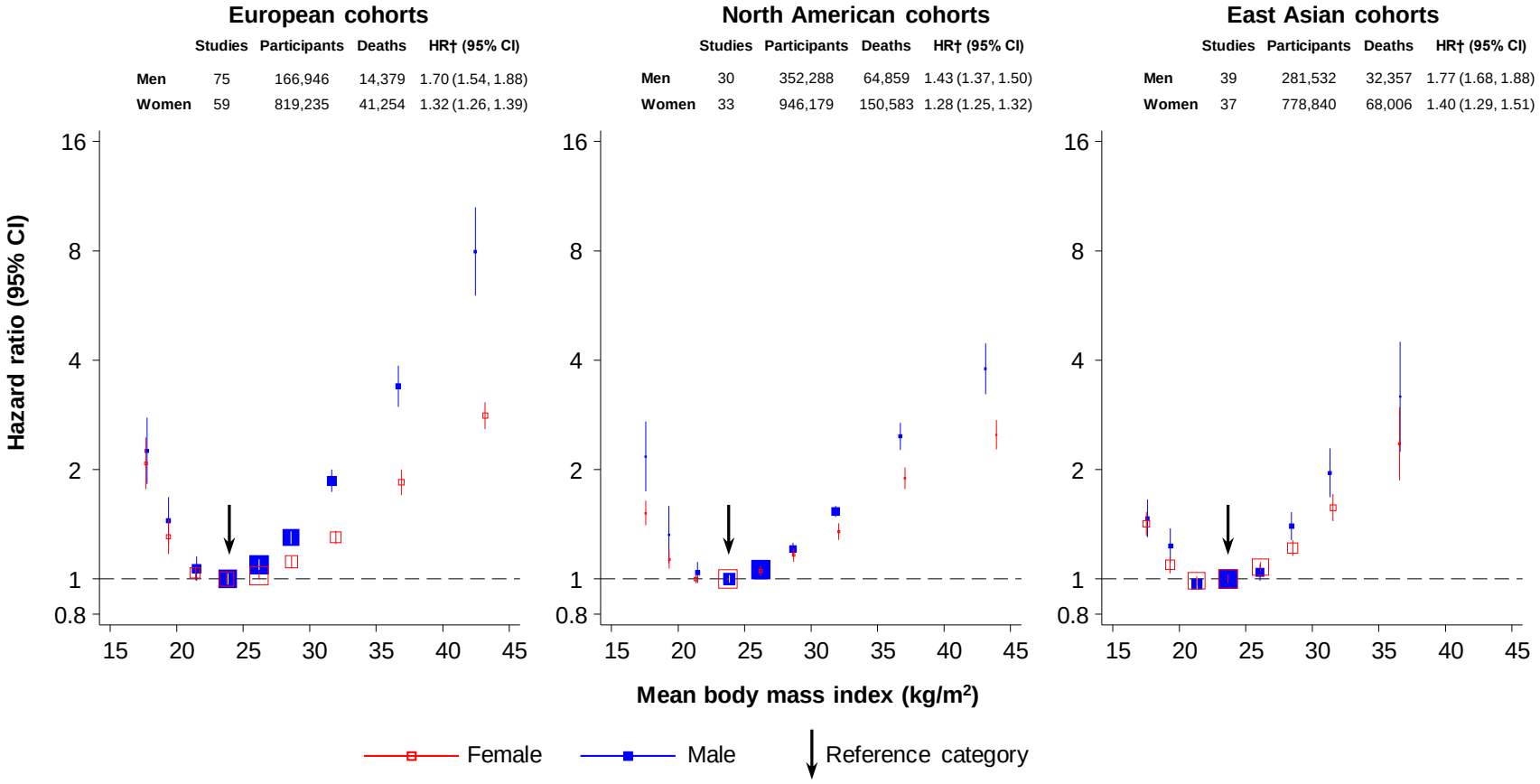


Analyses are restricted to never-smokers without pre-existing chronic disease, and exclude the first 5 years of follow-up.

BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2. Reference category (arrow) is 22.5 to <25 kg/m^2.

Group-specific CIs are from floating variance estimates (reflecting independent variability within each category, including the reference group). Areas of squares are proportional to the information content in each.

eFigure 3: 9 BMI categories vs all-cause mortality, by sex and 3 geographic regions



Analyses are restricted to never-smokers without pre-existing chronic disease, and exclude the first 5 years of follow-up.

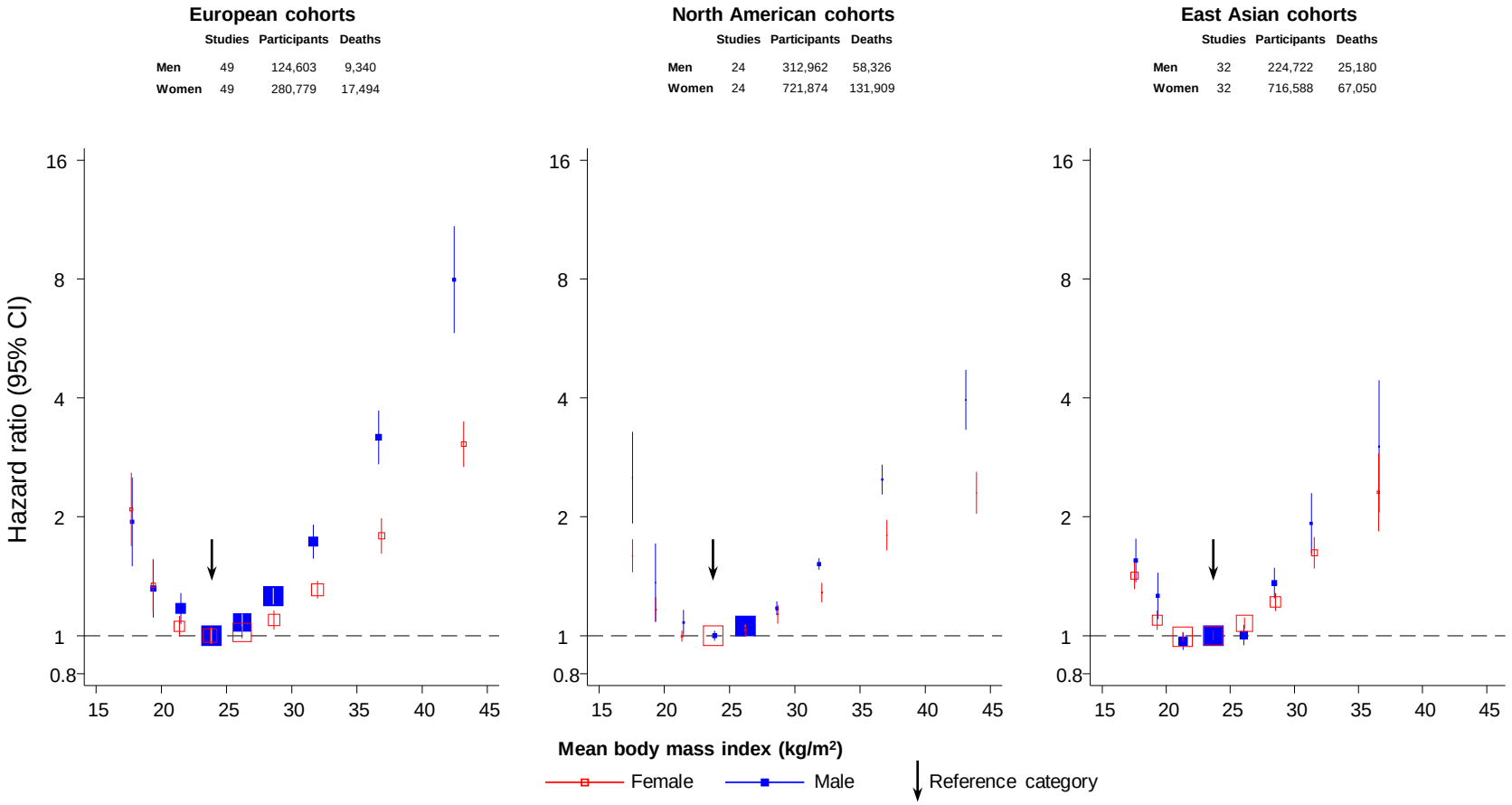
BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2.

Reference category (arrow) is BMI 22.5 to <25 kg/m^2.

Group-specific CIs are from floating variance estimates (reflecting independent variability within each category, including reference).

Areas of squares are proportional to the information content in each. The highest BMI category in East Asians was removed because of small numbers.

eFigure 4: 9 BMI categories vs all-cause mortality, by sex and 3 geographic regions, in studies with both men and women



Analyses are restricted to never-smokers without pre-existing chronic disease, and exclude the first 5 years of follow-up.

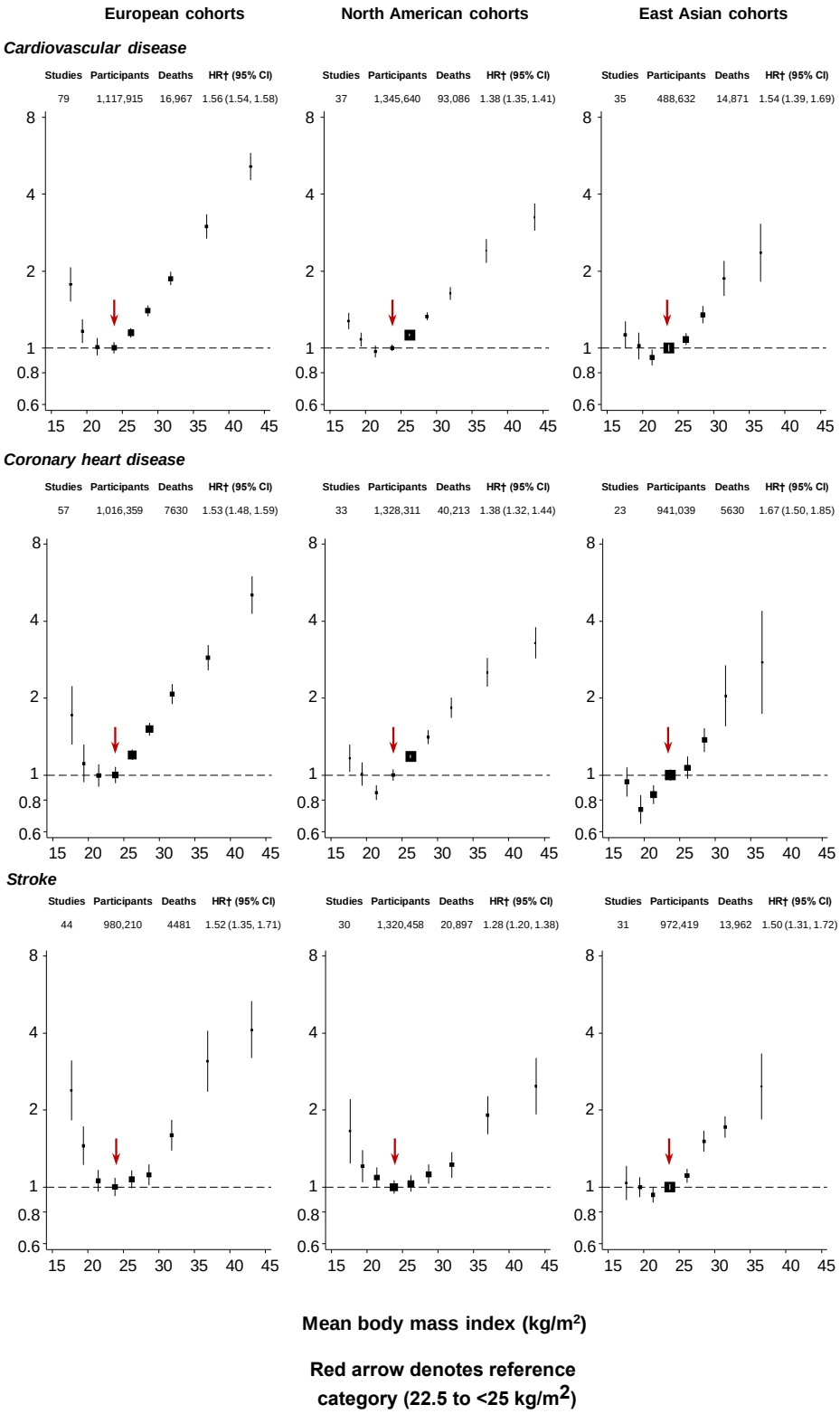
BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2.

Reference category (arrow) is BMI 22.5 to <25 kg/m^2.

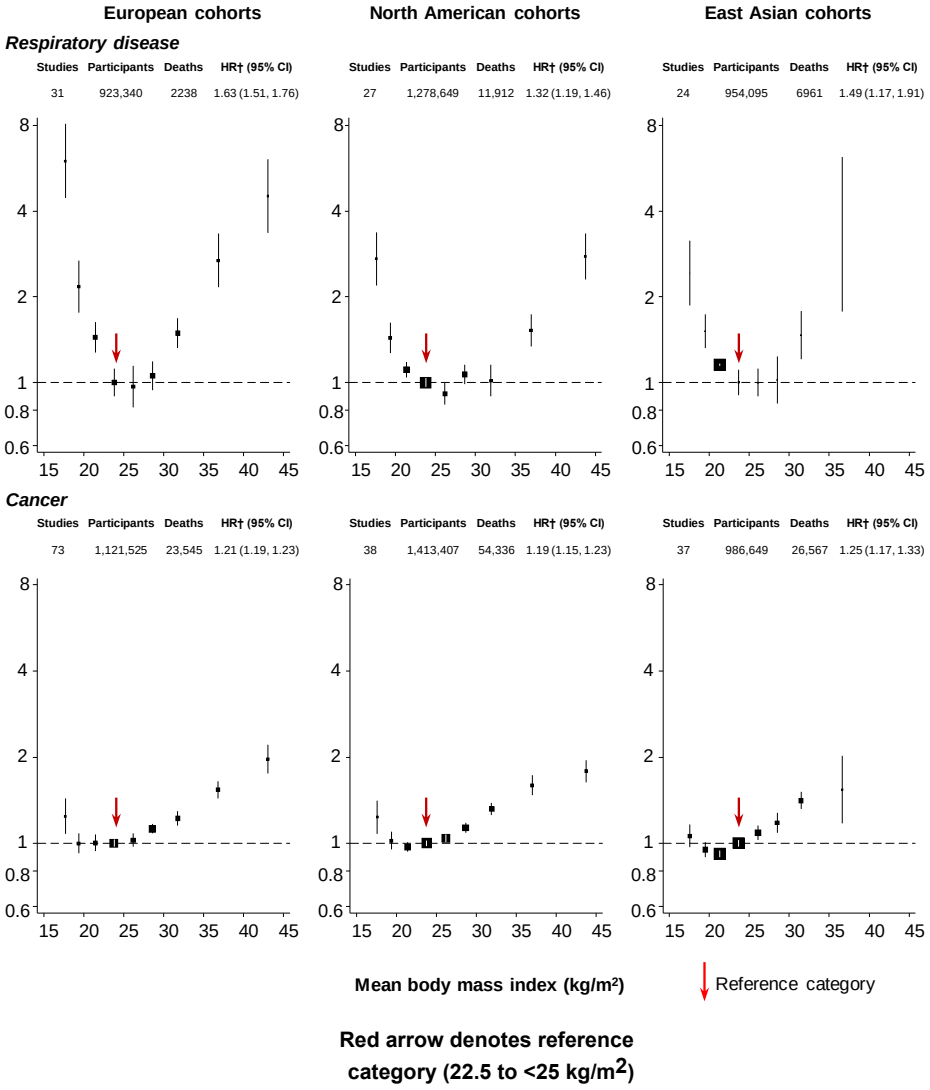
Group-specific CIs are from floating variance estimates (reflecting independent variability within each category, including reference).

Areas of squares are proportional to the information content in each. The highest BMI category in East Asians was removed because of small numbers.

eFigure 5: 9 BMI categories vs cause-specific mortality, by 3 geographic regions



eFigure 5 (continued)



†HR, hazard ratio per 5 kg/m^2 BMI in the range BMI >25 kg/m^2 (and 95% CI).

Analyses are restricted to never-smokers without pre-existing chronic disease, exclude the first 5 years of follow-up, and include data from all geographical regions.

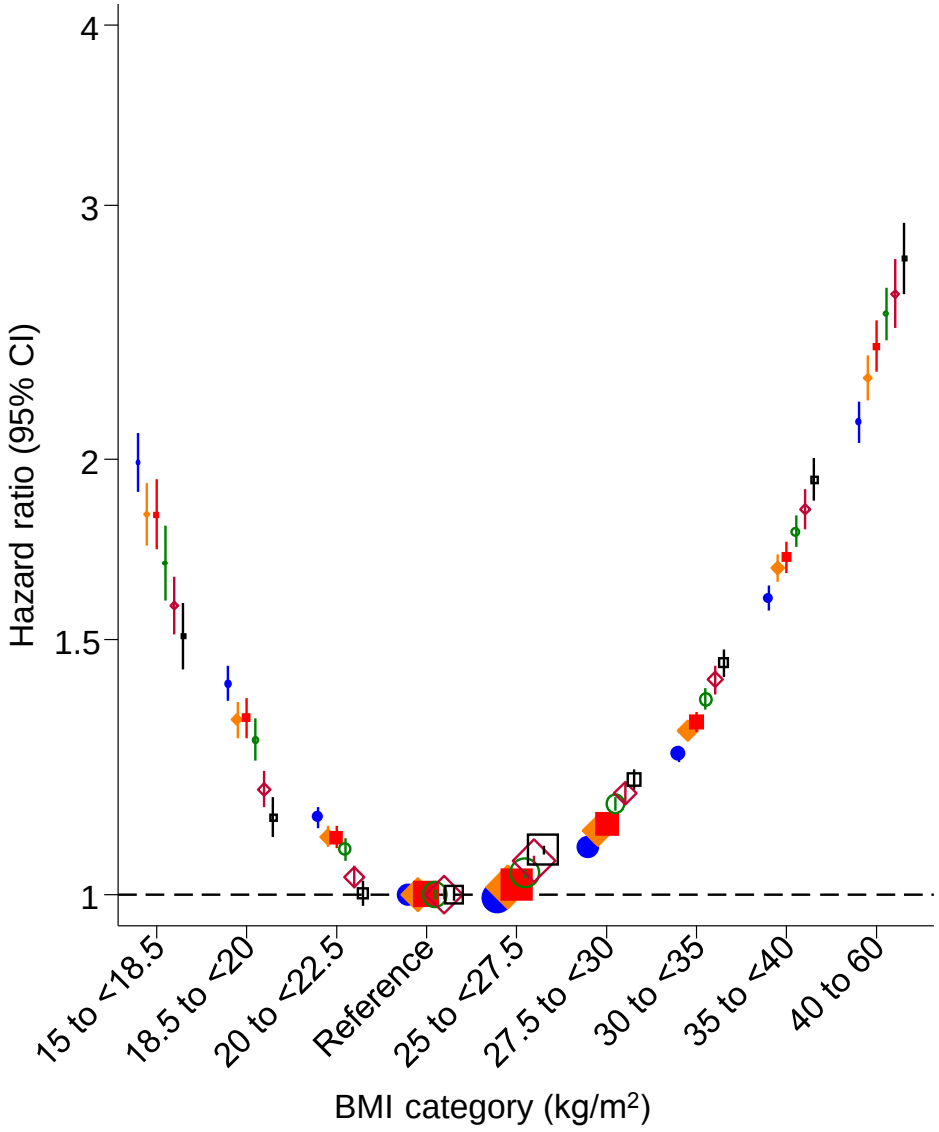
BMI groups: 15 to <18.5, 18.5 <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2. Reference category (arrow) is 22.5 to <25 kg/m^2. Reference group is BMI 22.5 to 25 kg/m^2.

CIs are from floating variance estimates (reflecting independent variability within each category, including reference).

Areas of squares are proportional to the information content of each.

The highest BMI category in East Asians was removed because it included only a limited number of individuals.

eFigure 6: 9 BMI categories vs all-cause mortality; effects of adjustments and exclusions



- Analysis adjusted for age (at baseline) and sex
- Analysis adjusted for age, sex, and smoking
- Analysis adjusted for age, sex, and smoking, excluding participants with known disease at baseline
- Analysis adjusted for age, sex, and smoking, excluding participants with known disease at baseline, and excluding the initial 5 years of follow-up
- Analysis adjusted for age and sex, excluding participants with known disease at baseline, restricted to never-smokers
- Analysis adjusted for age and sex, excluding participants with known disease at baseline, restricted to never-smokers, and excluding the initial 5 years of follow-up

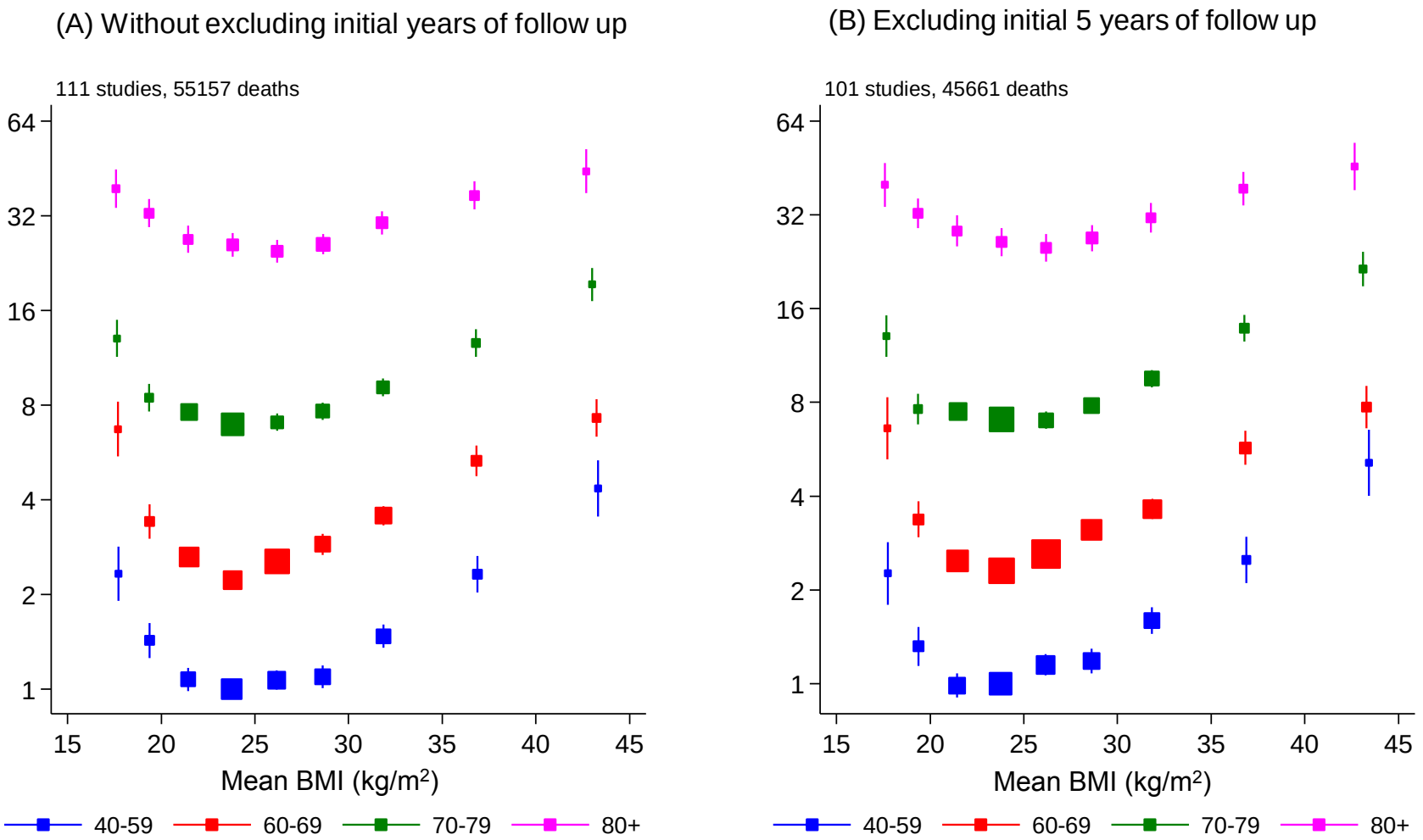
BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to<35, 35 to<40 and 40 to <60 kg/m^2

Reference category is BMI 22.5 to <25 kg/m^2 for all analyses.

Group-specific CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

Areas of symbols are proportional to the information content of each.

eFigure 7: 9 BMI categories vs all-cause mortality in the studies that could provide analyses by age at risk



Analyses are restricted to never-smokers without pre-existing chronic disease, and exclude the first 5 years of follow-up.

BMI groupings: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to<35, 35 to<40, and 40 to <60 kg/m^2.

Reference category is BMI 22.5 to <25 kg/m^2.

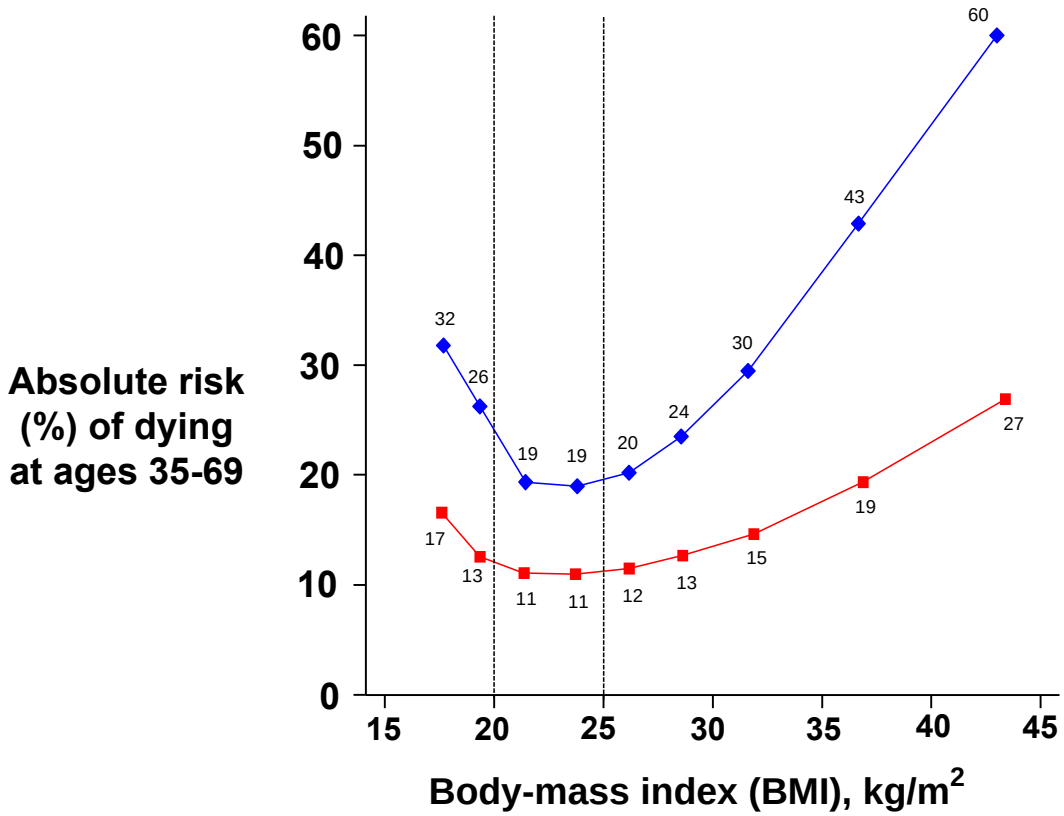
Group-specific confidence intervals (CIs) were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group).

Areas of squares are proportional to the information content in each.

eFigure 8: Absolute risks corresponding to the overall relative risks

Effects of the Global BMI Consortium relative risks on absolute risks of death at ages 35-69, if absolute risks in the reference BMI category are 19% male and 11% female

(which are intermediate between the current risks in Western Europe and in North America)

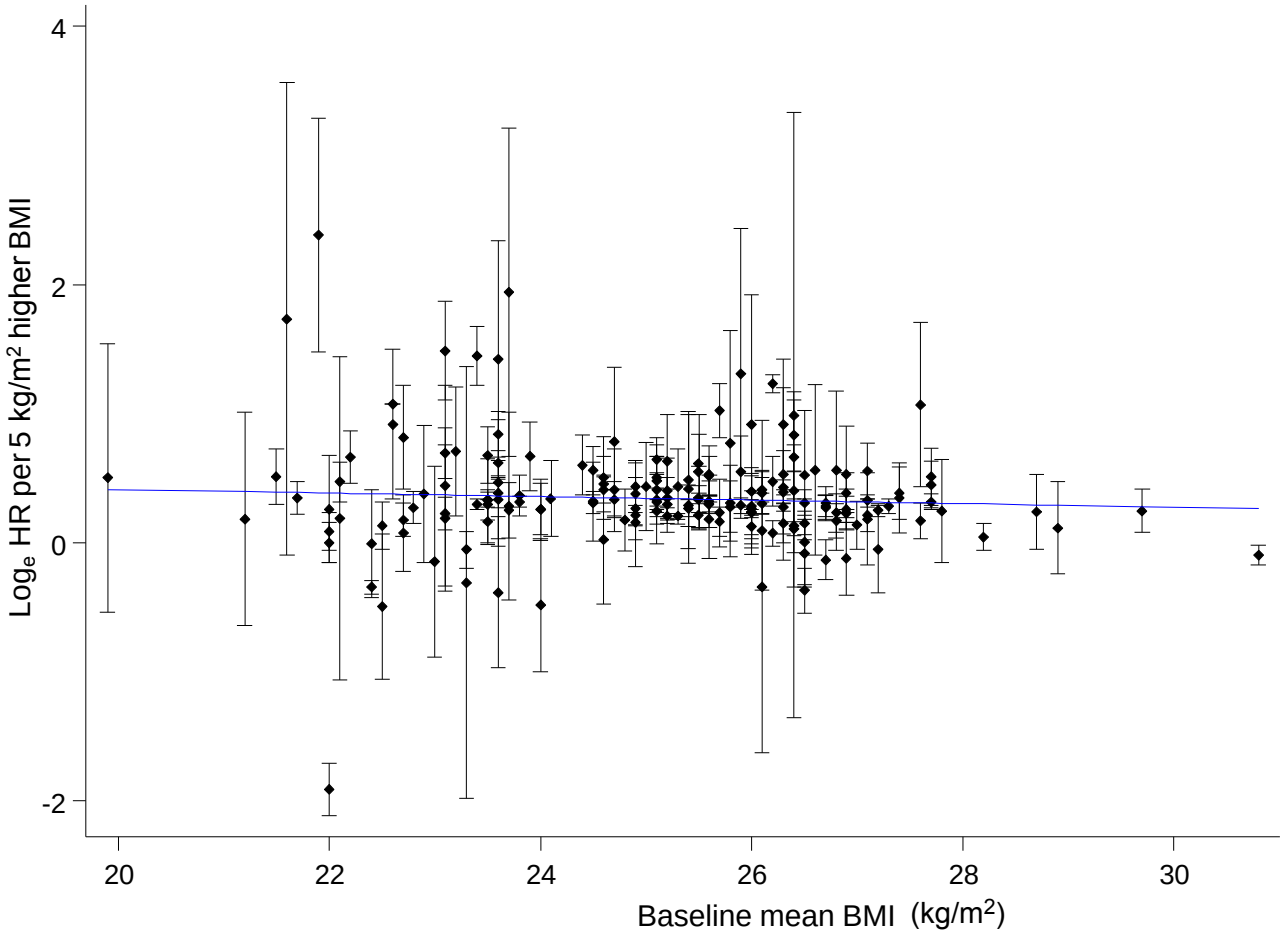


Relative and absolute risks of death at ages 35-69 by BMI and by sex, if 35-year risk in the reference BMI category is 19% male, 11% female*

BMI category, kg/m^2	Male			Female		
	Consortium death rate ratio, RR	Mean annual rate per 1000	35-year risk, %	Consortium death rate ratio, RR	Mean annual rate per 1000	35-year risk, %
15-18.5 (underweight)	1.82	10.93	31.8	1.55	5.17	16.6
18.5-20	1.44	8.70	26.2	1.15	3.85	12.6
20-22.5	1.02	6.15	19.4	1.01	3.35	11.1
22.5 to <25 (reference)	1.00	6.02	19.0	1.00	3.33	11.0
25-27.5 (overweight)	1.07	6.47	20.3	1.05	3.49	11.5
27.5-30 (overweight)	1.27	7.66	23.5	1.16	3.87	12.7
30-35 (grade 1 obese)	1.66	9.97	29.5	1.36	4.52	14.6
35-40 (grade 2 obese)	2.66	16.02	42.9	1.85	6.15	19.4
40-60 (grade 3 obese)	4.35	26.17	60.0	2.69	8.95	26.9

* If the mean of age-specific death rates/1000 in the age range 35-69 is R, then 35-year risk (%) of dying in this age range is 100 – 100 exp (–35 R/1000). This yields the reference category death rates (from the risks of 19% and 11%). Multiplication by RRs then yields the other death rates, from which come 35-year risks.

eFigure 9: Log_e hazard ratio for all-cause mortality per 5 kg/m^2 higher BMI, plotted against mean BMI in each study

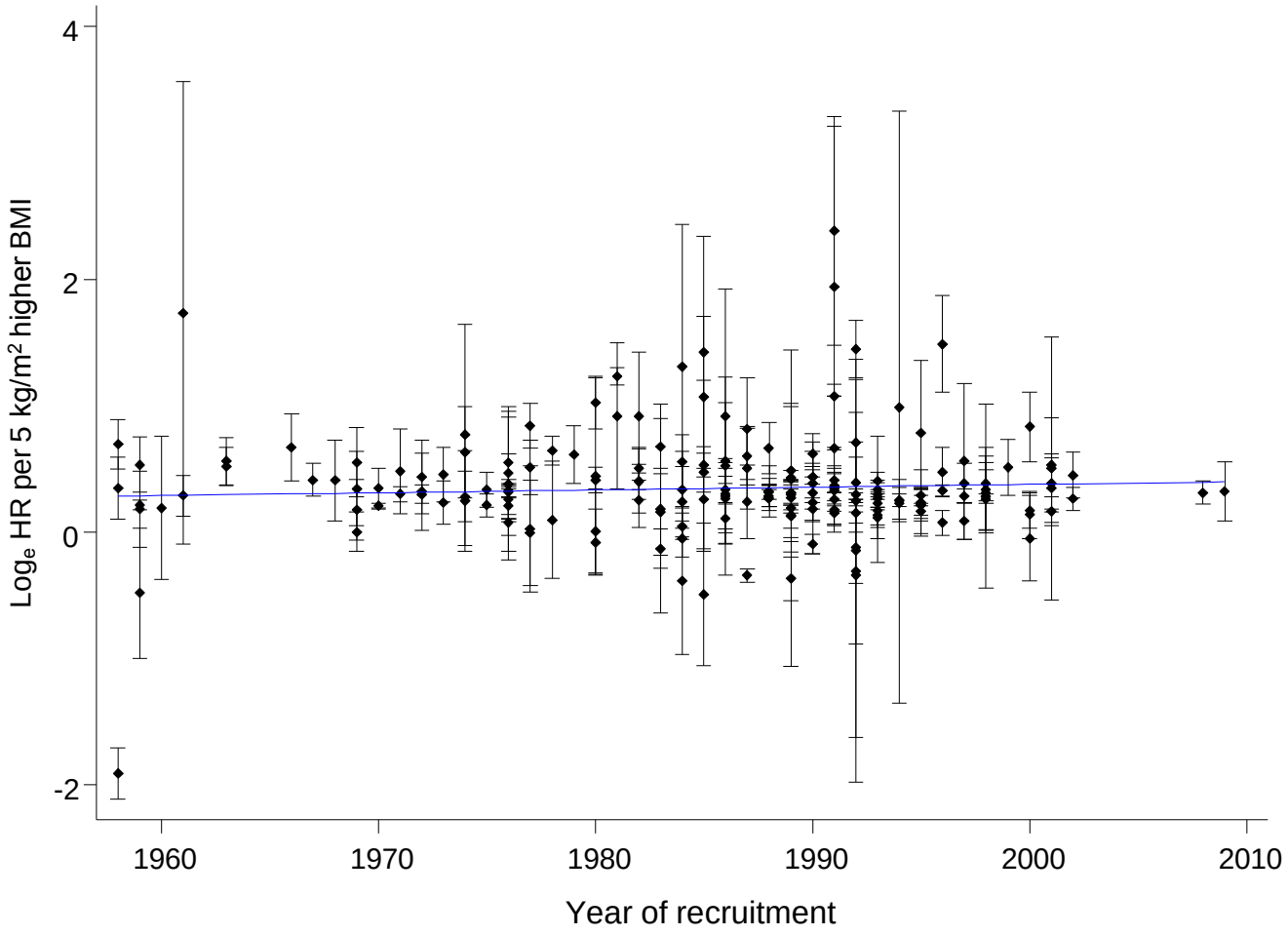


Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers without pre-existing chronic disease.

HRs per 5 units of BMI were estimated by inverse-variance-weighted regression of the pooled log HR on BMI in the BMI range 25 to 60 kg/m^2.

Each point represents one study. The line has been fitted by meta-regression: P-value testing for non-zero slope = 0.431.

eFigure 10: Log_e hazard ratios for all-cause mortality per 5 kg/m^2 higher BMI, plotted against median year of baseline survey

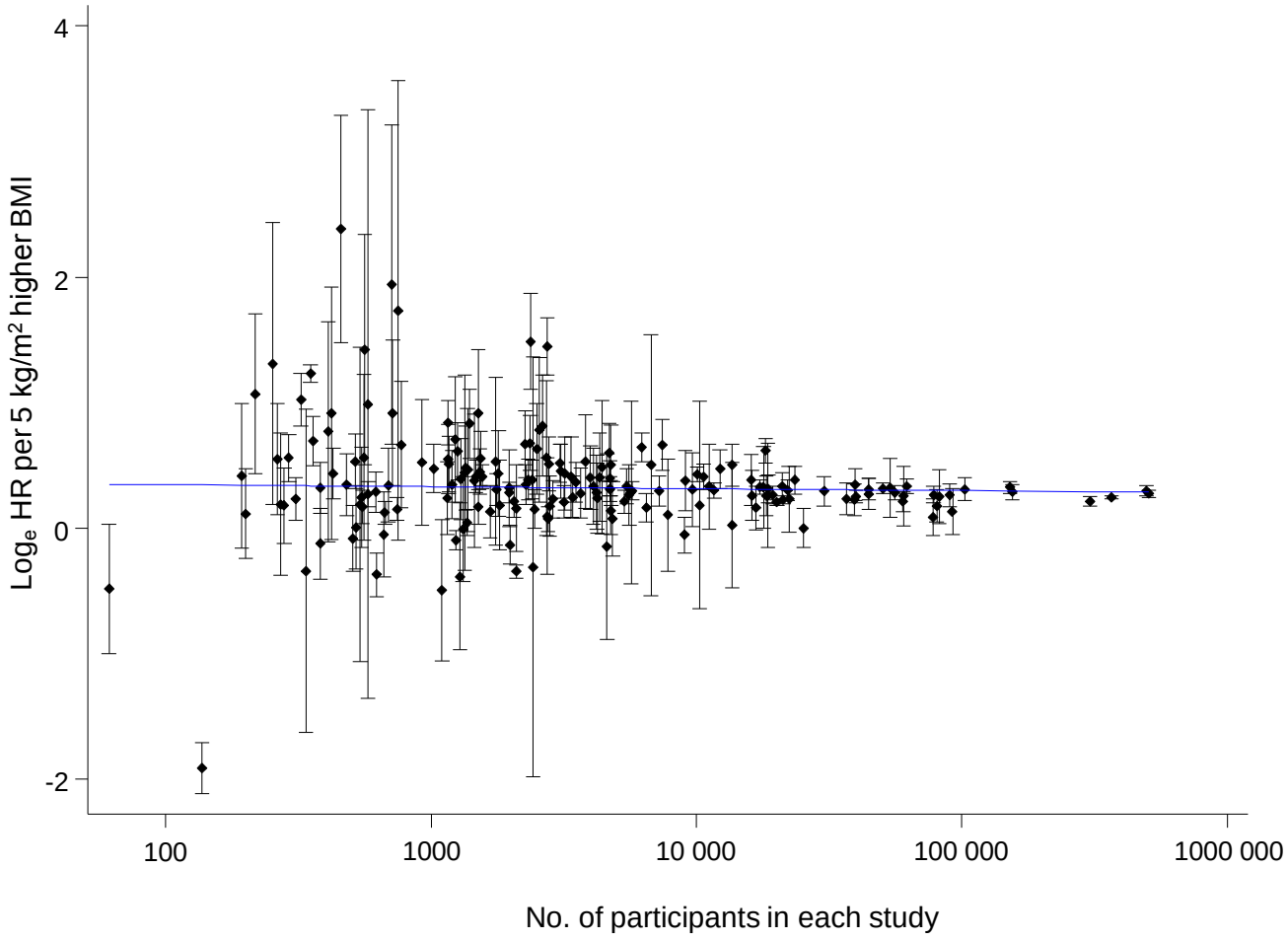


Analyses excluded the first 5 years of follow-up, restricted to never-smokers without pre-existing chronic disease.

HRs per 5 units of BMI were estimated by inverse-variance-weighted regression of the pooled log HR on BMI in the BMI range 25 to 60 kg/m^2.

Each point represents one study. The line has been fitted by meta-regression: P-value testing for non-zero slope = 0.491.

eFigure 11: Log_e hazard ratio for all-cause mortality per 5 kg/m^2 higher BMI, plotted against study size



Analyses excluded the first 5 years of follow-up, and were restricted to never-smokers and people without pre-existing chronic disease.

HRs per 5 units of BMI were estimated by inverse-variance-weighted regression of the pooled log HR on BMI in the BMI range 25 to 60 kg/m^2.

Each point represents one study. The line has been fitted by meta-regression: P-value testing for non-zero slope = 0.615.

eAppendix 1: Investigators in each study

Abdominal Aortic Aneurysm Screening Program: P Norman, K Jamrozik; **Agricultural Health Study**: L B Freeman, H Chen; **Air Force/Texas Coronary Atherosclerosis Prevention Study**: R W Tipping; **Aito Town Study**: A Okayama, H Ueshima, H Maegawa; **Akabane Study**: M Nakamura, N Aoki; **Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial**: B R Davis, L Simpson, S Pressel; **Beijing Anzhen Cohort Study**: C H Yao, Z S Wu; **Anzhen 02 Cohort Study**: Z S Wu; **Apolipoprotein Related Mortality Risk Study:** G Walldius, I Jungner; **Atherosclerosis Risk in Communities Study:** L Chambless, A Folsom, J Stevens, C Ndumele; **ATTICA Study:** D B Panagiotakos, C Pitsavos, C Chrysohoou; **Australian Diabetes, Obesity and Lifestyle Study:** D Magliano, A Peeters, J Shaw, E L M Barr; **Australian Longitudinal Study of Ageing**: M Luszcz, H Christensen; **Breast Cancer Detection Demonstration Project**: S C Moore; **Beijing Aging Study**: Z Tang; **Belgian Inter-university Research on Nutrition and Health**: G De Backer, D De Bacquer, M Kornitzer; **Bezafibrate Infarction Prevention Registry Study**: M Benderly; **British Regional Heart Study**: P H Whincup, S G Wannamethee, R Morris; **British Union Provident Association Study**: N Wald, J Morris, M Law; **British Women's Heart and Health Study**: J-P Casas, C Dale, DA Lawlor; **Bruneck Study**: S Kiechl, J Willeit, P Willeit; **Busselton Health Study**: M W Knuiman, M Divitini, H Bartholomew; **Caerphilly Prospective Study**: G Davey Smith, P Sweetnam, P Elwood, J Yarnell, J Gallacher; **California Teachers Study**: L Bernstein, H Anton-Culver; **Cancer Prevention Study I:** A V Patel, J S Hildebrand, B Carter, S M Gapstur; **Cancer Prevention Study II**: A V Patel, J S Hildebrand, S M Gapstur; **Capital Iron & Steel Company Study**: X G Wu; **Capital Iron & Steel Company Hospital Cohort**: J Zhou, X H Yu; **Cardiovascular Disease Risk Factors Two-Township Study**: W H Pan; **Cardiovascular Health Study (CHS1-CHS2)**: M Cushman, E Enright, R Kronmal; **Cardiovascular Study in the Elderly**: E Casiglia; **Consultation Bureau Project**: D Kromhout; **Centre d'Investigations Preventives et Cliniques (IPC), Paris**: A Benetos, L Guize(deceased); **Charleston Heart Study**: P J Nietert, S Sutherland, J Keil; **Chicago Heart Association Detection Project In Industry**: P Greenland; **China Hypertension Survey Epidemiology Follow-up Study**: J He; **China Prospective Study**: M Smith, G Yang, M Zhou, L Yang, G Whitlock, Z Chen; **Civil Service Workers Study**: A Tamakoshi; **CLUE II**: K Visvanathan, J Hoffman-Bolton; **Cohort of Norway (FINNMARK)**: R Selmer, A J Sögaard, L L Håheim, H E Meyer, W Nystad; **Cohort of Norway (HUBRO)**: R Selmer, A J Sögaard, L L Håheim, H E Meyer, W Nystad; **Cohort of Norway (OPPHED)**: R Selmer, A J Sögaard, L L Håheim, H E Meyer, W Nystad; **Cohort of Norway (OSLO2)**: R Selmer, A J Sögaard, L L Håheim, H E Meyer, W Nystad; **Cohort of Norway (TROMS)**: R Selmer, A J Sögaard, L L Håheim, H E Meyer, W Nystad; **Cohort of Swedish Men**: N Hakansson; **Community-based Cancer Screening Project**: C J Chen; **Copenhagen City Heart Study**: B G Nordestgaard, A Tybjaerg-Hansen, R Frikke-Schmidt, G Jensen, P Schnohr; **Data from an Epidemiological Study on the Insulin Resistance Syndrome**: B Balkau, R Roussel, F Fumeron; **Diet and Risk of Cardiovascular Disease in Spain**: M A Rubio-Herrera, J A Gutiérrez-Fuentes, J A Gómez-Gerique, A G de la Cámara; **Dubbo Study of the Elderly**: L A Simons; **East Beijing Cohort Study**: Z L Wu, L Q Chen, G L Shan; **Edinburgh Artery Study**: J F Price, S Mclachlan; **Electrical Generating Authority of Thailand Study**: P Sritara; **Epidemiologische Studie zu Chancen der Verhütung**: B Schöttker, K-U Saum, B Holleczek, H Brenner, D Rothenbacher, V Arndt; **Established Populations for the Epidemiologic Study of the Elderly Studies: East Boston** J O Taylor, **Iowa** R B Wallace, **New Haven** C L Phillips, **North Carolina** G Fillenbaum, D G Blazer; **European Prospective Investigation into Cancer and Nutrition:** B B de Mesquita, T Pischon, E Lund, A Cross, K T Khaw, N J Wareham, Y T Van Der Schouw, S Törnberg, J Carstensen; **Fangshan Cohort Study:** D F Gu, X F Duan; **Finnish Mobile Clinic Survey:** A Aromaa, P Knekt, A Reunanen; **Finrisk 1977**: J Tuomilehto, P Jousilahti, E Vartiainen, P Puska; **Finrisk 1982**: J Tuomilehto, P Jousilahti, E Vartiainen, P Puska; **Finrisk Cohort 1987**: P Jousilahti, S Männistö, M Peltonen; **Finrisk Cohort 1992**: V Salomaa, K Harald, K Borodulin, M Perola; **Finrisk Cohort 1997**: V Salomaa, A Juolevi, A Jula; **Flemish Study on Environment, Genes and Health (FLEMENGHO)**: T Kuznetsova, T Richart, J Staessen, L Thijs; **Fletcher Challenge Heart and Health Study**: M Woodward, S MacMahon, R Norton, S Ameratunga, G Whitlock, R Jackson; **Framingham Offspring Study**: R B D'Agostino Sr;**Funagata Study**: M Daimon, T Oizumi, T Kato, T Kayama; **Glucose Intolerance, Obesity and Hypertension Study**: R Dankner, A Chetrit, F Lubin; **Goteborg 1913 Study**: L Wilhelmsen; **Goteborg 1933 Study**: A Rosengren, L Wilhelmsen, L Welin ; **Goteborg 1943 Study**: A Rosengren, L Wilhelmsen,; **Göttingen Risk Incidence and Prevalence Study**: D Nagel; **Guangzhou Occupational Cohort Study**: R Dankner, A Chetrit, F Lubin, T H Lam, C Q Jiang, Y He,; **Health Effects of Arsenic Longitudinal Study**: H Ahsan; **Health in Men Study**: L Flicker, B B Yeap; **Health Professionals Follow-up Study**: WC Willett, A Flint and E B Rimm; **Helsinki Aging Study**: R S Tilvis, T E Strandberg; **Helsinki Businessmen Study**: T E Strandberg, V Salomaa, R S Tilvis; **Hertfordshire Cohort Study**: C Cooper, E Dennison, A A Sayer, M Edwards; **Hisayama Study**: Y Kiyohara, H Arima, T Ninomiya, M Lida; **Hong Kong Study**: J Woo, S C Ho; **Honolulu Heart Program**: B Rodriguez, D Sharp, J D Curb; **Hoorn Study**: C D A Stehouwer, J M Dekker, G Nijpels; **Huashan Study**: Z Hong, M S Huang, B Zhou; **Ibaraki Prefectural Health Study**: F Irie; **Ikawa, Kyowa, Noichi Study**: S Sato, H Iso, A Kitamura, Y Naito; **Iowa Women's Health Study**: J R Cerhan, D Lazovich; **Israeli Ischaemic Heart Disease Study**: U Goldbourt; **Japan Collaborative Cohort Study**: A Tamakoshi; **Japan Public Health Center–based Prospective Study 1**: M Inoue; **Japan Public Health Center–based Prospective Study 2**: S Tsugane; **Japan Railways**: M Tomita, Y Nishimoto, T Murayama; **The Kinmen Neurological Disorders Survey**: J L Fuh; **Konan Health and Nutrition Study**: H Ueshima, Y Kita, S R Choudhury; **Korean Cancer Prevention Study:** J M Samet, K J Jung, Y D Yun, S H Jee; **Korean Multi-center Cancer Cohort Study**: D Kang; **Korean Medical Insurance Corporation Study**: I Suh, S H Jee, I S Kim; **Kuopio Ischaemic Heart Disease Study**: J T Salonen, J Kauhanen, T-P Tuomainen, J Virtanen; **Kyowa Study**: H Iso, S Sato, A Kitamura, Y Naito; **Life Span Study Cohort**: E Grant; **Lipid Research Clinics Follow-up Study**: M Criqui, C Davis; **Longitudinal Aging Study Amsterdam**: M Visser, D J H Deeg, J L Poppelaars; **Lower Extremity Arterial Disease Event Reduction Trial**: T W Meade; **Malmö Prevention Project**: B Hedblad, P Nilsson, O Melander, G Engström; **Melbourne Collaborative Cohort Study**: G G Giles, D English; **Midspan Collaborative Study**: O Melander, C Hart, G Davey Smith, D Hole(deceased), C Gillis; **Midspan Family Study**: A McConnachie, N Sattar, G Watt; **The Million Women Study**: A Balkwill B J Cairns, G K

Reeves, J Green, V Beral, The Million Women Study Collaborators (www.millionwomenstudy.org); **Minnesota Heart Health Project**: D Jacobs, H Blackburn, R Luepker; **Minnesota Heart Survey**: D Jacobs, H Blackburn, R Luepker; **Miyagi Cohort:** Y Nishino; **Miyama Cohort Study**: T Hashimoto, K Sakata; **MONICA Göteborg Study**: A Rosengren; **MONICA/KORA Augsburg Survey 1**: W Koenig, C Meisinger; **MONICA/KORA Augsburg Survey 2**: C Meisinger, W Koenig; **MONICA/KORA Augsburg Survey 3**: W Koenig, C Meisinger; **Monitoring of CVD Risk Factors Project**: W M Verschuren; **MRC Study of Older People:** A Fletcher; **Multi-Ethnic Study of Atherosclerosis**: S J Shea, K E Watson, I De Boer, A C Armstrong; **Multiple Risk Factor Intervention Trial**: L H Kuller, J Neaton, L Eberly; **Mumbai Cohort Study**: P C Gupta, M S Pednekar; **National Health and Nutrition Examination Survey I:** R F Gillum, B Howard, J Umans, J R Albertorio-Díaz, C Cox; **National Health and Nutrition Examination Survey III**: J R Albertorio-Díaz, R F Gillum; **National Health Interview Survey:** C L Jackson; **National Heart Foundation Risk Factor Prevalence Survey 1989**: T A Welborn; **Newcastle Study**: A Dobson; **NHLBI Framingham Heart Study**: D Levy, R B D'Agostino Sr, H Silbershatz; **NIH-AARP Diet and Health Study**: Y Park, R Sinha; **Noichi Study**: H Iso, S Sato, A Kitamura, Y Naito; **North Karelia Project**: V Salomaa, P Puska, E Vartiainen, T Laatikainen; **Northwick Park Heart Study I**: T Meade, K Garrow, J Cooper; **Northwick Park Heart Study II**: J A Cooper; **Norwegian Counties Study (NCS1):** R Selmer, A Tverdal; **Norwegian Counties Study (NCS2)**: R Selmer, A Tverdal; **Norwegian Counties Study (NCS3)**: R Selmer, A Tverdal; **Nova Scotia Health Survey**: J A Shaffer, K W Davidson, S Kirkland; **Nurses' Health Study I:** JoAnn E Manson, Frank Hu, and Meir J Stampfer; **Nurses' Health Study II:** H Eliassen, W C Willett, S Hankinson; **Nutrition Intervention Trials - Linxian**: Y Qiao; **NYU Women's Health Study**: A Zeleniuch-Jacquotte; **Occupational Groups (OG), Rome**: A Menotti, A Spagnolo; **Ohasama Study**: Y Imai, T Ohkubo, A Hozawa, I Tsuji, S Hisamichi; **Ohsaki National Health Insurance Cohort Study**: Y Tomata; **Osaka Study**: S Sato; **Oslo Study**: I Holme, A Tverdal, L L Haheim, I Hjermann, P Leren; **Oyabe study**: H Nakagawa, M Sakurai; **Paris Prospective Study I**: P Ducimetiere, J Empana; **Perth Risk Factors Survey:** K Jamrozik, M Hobbs, R Broadhurst; **Physicians' Health Study I & II**: J M Graziano, H D Sesso, P M Ridker, J E Buring, C Hennekens; **Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial**: B Wilcox; **Prospective Study of Women in Gothenburg**: C Bengtsson, C Björkelund, L Lissner; **Prevention of Renal and Vascular End Stage Disease Study**: S J L Bakker, R Gansevoort, B Wolffenbuttel; **Progetto CUORE (ATENA)**: S Giampaoli, L Palmieri, D Vanuzzo, S Panico, C Donfrancesco, L Pilotto; **Progetto CUORE (EMOFRI, MATISS83, MATISS87, MATISS93, MONFRI86, MONFRI89, MONFRI94):** S Giampaoli, L Palmieri, D Vanuzzo, S Panico, C Donfrancesco, L Pilotto; **Prospective Cardiovascular Münster Study**: G Assmann, H Schulte; **Prospective Epidemiological Study of Myocardial Infarction**: G Assmann, H Schulte; **Prospective Study of Pravastatin in the Elderly at Risk**: N Sattar, J W Jukema; **Puerto Rico Heart Health Program**: C J Crespo, P Sorlie, M Garcia-Palmieri; **Quebec Cardiovascular Study**: P Lupien, N M Robitaille, B Cantin; **Rancho Bernardo Study**: H Araneta, D Kritz-Silverstein, E Barrett-Connor, M Criqui, R Langer; **Renfew and Paisley Study**: C Hart, G Davey Smith, D Hole(deceased); **Research Centre for Prevention and Health (Glostrup Population Studies):** T Jørgensen, T Thomsen, J Jespersen; **Reykjavik Study**: V Gudnason, T Aspelund, B Thorsson; **Risk Factors and Life Expectancy Pooling Project (ATS_SAR)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (DISCO)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (GREPCO):** M Trevisan; **Risk Factors and Life Expectancy Pooling Project (GUBBIO)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (MICOL)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (MONICA)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (NFR)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (OB43)**: M Trevisan; **Risk Factors and Life Expectancy Pooling Project (RF2)**: M Trevisan; **The Rotterdam Study**: O H Franco, K Dhana, M Kavousi, A Hofman, J Kiefte-de Jong; **The Rotterdam Study II**: O H Franco, T Muka, H W Tiemeier, F van Rooij; **The Rotterdam Study III**: O H Franco, A Hofman, J D Schoufour, J C Kiefte-de Jong; **Saitama Cohort Study**: K Nakachi, K Imai; **Scottish Heart Health Study**: H Tunstall-Pedoe, M Woodward; **Seoul Male Cancer Cohort**: Y-O Ahn; **Seven Cities Cohorts Study:** X H Fang, S C Li, Q D Yang; **Seven Countries Croatia**: R Buzina; **Seven Countries Finland**: A Nissinen, H Tolonen; **Seven Countries Greece**: C Aravanis, A Dontas, A Kafatos; **Seven Countries Italy**: A Menotti; **Seven Countries Japan**: H Adachi, H Toshima, T Imaizumi; **Seven Countries Netherlands**: D Kromhout, J M Geleijnse; **Seven Countries Serbia**: S Nedeljkovic, M Ostojic; **Seven Countries US**: D Jacobs, H Blackburn; **Seventh-day Adventist Cohort Study-1**: W L Beeson; **Shanghai Cohort Study**: J-M Yuan, Z M Chen; **Shanghai Men's Health Study**: X-O Shu; **Shanghai Women's Health Study**: Y-T Gao; **Shibata Cohort Study**: H Tanaka, T Nakayama, N Yoshiike, T Yokoyama, C Date; **Shigaraki Town Study**: Y Kita, A Nozaki, H Ueshima; **Shirakawa Study**: H Horibe, Y Matsutani, M Kagaya; **Singapore Chinese Health Study**: W P Koh; **Singapore Thyroid and Heart Study**: K Hughes, J Lee; **Singapore National Health Survey 1992**: D Heng, S K Chew; **Six Chinese Cohorts Study**: B F Zhou, H Y Zhang; **Speedwell Study:** Y Ben-Shlomo, J Gallacher, J Yarnell, G Davey Smith; **Strong Heart Study**: B V Howard, L G Best, M Begum; **Study of Health in Pomerania**: H Völzke; **Swedish Mammography Cohort**: A Wolk; **Tanno-Soubetsu Study**: K Shimamoto, S Saitoh; **Tecumseh Study**: J Keller; **Three Prefecture Study Aichi**: H Tanaka; **Three Prefecture Study Miyagi**: I Tsuji; **45 and Up Study:** G Joshy, R J Korda, E Banks; **Thrombosis Prevention Trial**: T W Meade; **Tianjin Study**: Z Z Li, H Y Zhang; **Toyama Study**: Hidaeki Nakagawa, M Sakurai; **Trivandrum Oral Cancer Screening Trial:** K Ramadas; **Tromsø Study**: I Njølstad, K Bonaa, E Arnesen; **Turkish Adult Risk Factor Study**: A Onat, G Can, H Yuksel; **United Kingdom Heart Disease Prevention Project**: H Tunstall-Pedoe; **Uppsala Longitudinal Study of Adult Men**: J Sundström, J Ärnlöv, U Risérus; **U.S.Radiologic Technologists (URST) Cohort**: C Kitahara; **Vicenza Thrombophilia and Athrosclerosis Project**: A Tosetto, F Rodeghiero; **Vitamins and Lifestyle (VITAL) Study:** E White; **Vorarlberg Health Monitoring and Promotion Programme**: H Ulmer, H Concin, G Nagel; **West of Scotland Coronary Prevention Study**: J W Jukema, I Ford; **Whitehall I Study**: M Kivimaki, M G Marmot, E Brunner, M J Shipley, A Fletcher, D Leon; **Whitehall II Study**: E J Brunner; **Women's Lifestyle and Health Study:** E Weiderpass; **Women's Health Initiative (Observational Study)**: S Wassertheil-Smoller; **Women's Health Study**: P M Ridker; **Württemberg Construction Workers Cohort**: V Arndt, H Brenner, D Rothenbacher; **Yunnan Tin Miner Cohort Study**: S X Yao; **Zaragoza Study**: A M Ibañez.

eAppendix 2: Pre-specified analysis plan

1. General methodological considerations

1.1 Participating consortia/cohort studies Consortia / large studies that had agreed to collaborate in this effort are listed below.

Main exclusions: Participants with BMI<15 and BMI>60 kg/m^2 will be excluded. In addition, participants of age <20 years and ⩾90 years at baseline will be excluded. Primary analyses will also exclude current and former smokers, and the first 5 years of follow-up.

1.2 Exposures and outcomes BMI will be pre-defined in the following categories: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25 (reference category), 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, 40 to 60 kg/m^2. Furthermore, to enable direct comparison with the Flegal et al meta-analysis results, BMI will also be categorized according to standard cut-points: 15 to <18.5, 18.5 to <25 (reference category), 25 to <30, 30 to <35, 35 to <40, 40 to 60 kg/m^2. The primary outcome of the analysis will be all-cause mortality. Secondary outcomes will include: cause-specific mortality, including mortality due to cancer, cardiovascular disease, CHD, stroke, and respiratory disease.

1.3 Unit of analysis The following advantages will derive from basing this meta-analysis on cohort-level (rather than consortium-level) estimates for the pooled analyses. First, this approach should enable appropriate pooling of the log hazard ratio (HR) estimates across different studies. Second, it should facilitate reliable investigation of BMI-mortality associations under different circumstances (eg, by different geographical regions, sex, and at different ages). Third, it should enable the reliable quantification of between-study heterogeneity. As the accrual of these advantages will be important to demonstrate that the present analysis represents a clear and significant methodological improvement over the methods used by Flegal et al, this approach has been strongly encouraged. Hence, to facilitate such analyses (and to enable a uniform approach to analyses across the participating consortia/studies), the Coordinating Center will provide STATA software scripts for direct use (or adaptation as needed). For example, given the categorical nature of the primary exposure, it is essential to obtain the full covariance matrix of the log HR estimates within each cohort to present relative risk as floating absolute risks and to facilitate more appropriate pooling using multivariate meta-analysis.

1.4 Avoidance of "double-counting" data from participating studies As some studies to be included in the present analysis have provided data on BMI and mortality outcomes to two or more of the participating consortia, it is important to ensure that data from such studies are not "double-counted" in the present meta-analysis. This will be achieved in consultation with coordinators of the participating consortia. In such situations, the information from the consortium to which the study has provided the maximum relevant data will provide results for that cohort.

1.5 Subgroup analysis Associations of all-cause mortality with BMI depend not only on the associations of specific causes of death with BMI in different regions (which might differ quantitatively), but also on how relatively common each specific cause of death is in the particular region (which can differ very substantially by region over time). Because of the latter point, there is no reason to expect a priori that the association of all-cause mortality with BMI will be similar in regions that have different underlying mortality patterns. Therefore, the primary analysis will be stratified by major geographical regions (ie, Europe/North America/Australia/NZ, South Asia, and East Asia). Furthermore, previous large-scale epidemiological studies have suggested that the association between BMI and all-cause mortality varies across different age groups, and different approaches used to assess BMI (ie, directly measured vs self-reported). It is therefore important to investigate the effect of BMI on mortality risk within geographical regions according to these different individual and study-level characteristics. Therefore, the meta-analysis will assess the association between BMI categories and all-cause mortality by sex-specific age groups (ie, 35 to 49, 50 to 59, 60 to 69, 70 to 79, 80 to 89 years of age at baseline), smoking status (never smokers only), and BMI assessment methods (self-reported vs. measured).

2. Statistical analyses plan

1. Each cohort lists whether information on the following chronic diseases were recorded at baseline examination: (i) cardiovascular disease (ie, myocardial infarction, stroke, CABG, angioplasty, peripheral artery disease, congestive heart failure); (ii) cancer (not including non-melanoma skin cancer); (iii) respiratory diseases (eg, COPD); and (iv) neurodegenerative diseases (ie, Parkinson's disease, Alzheimer's disease). We acknowledge that not all studies have full information on these chronic diseases at baseline. However, a table providing the specific diseases recorded at baseline by each study will clarify the exclusions made in the main analyses.

2. The following cohort-level characteristics at baseline will be provided in
(i) people without chronic disease at baseline (as defined in #1) and
(ii) all people (ie, without exclusion of people with known disease at baseline) (as a secondary analysis for comparison purpose):

a. Total number of participants
b. Mean (SD) of BMI at baseline
c. Mean (SD) of age at baseline.
d. Mean (SD) of age at death.
e. Number (%) of males.
f. Number (%) of current tobacco smokers.
g. Median (IQR) of baseline survey year.
h. Median (IQR) of follow-up time.
i. Total number of deaths (incl. specifically deaths from cardiovascular disease, CHD, stroke, cancer, and respiratory disease).
j. Country and region (ie, Europe, North America, South Asia, East Asia, Australia/NZ).
k. Method of assessment of height and weight (ie, self-reported or directly measured).
l. Ascertainment methods for (if possible, underlying) cause of death (death certificate only, or death certificate supplemented by medical record).
m. Details of censoring for cases and follow-up.

3. Primary analyses will be in pre-defined BMI categories [15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25 (reference category), 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, 40 to 60 kg/m^2].

Parallel analyses will use standard BMI categories [15 to <18.5, 18.5 to <25 (reference category), 25 to <30, 30 to <35, 35 to <40, 40 to 60 kg/m^2].

Both analyses will be conducted in people without chronic disease at baseline (as defined in #1).

4. To investigate measurement error in measured and self-reported BMI, each cohort provides mean (SD) BMI values at baseline and, if available, at re-survey in studies with measured BMI, within each category of baseline BMI.

5. For each analysis in #7 and #8, studies provide information on the number of participants and number of deaths within each of these categories.

6. Analyses are based on Cox proportional hazards (PH) models estimated for each study separately, using attained age (equivalent to calendar age or age-at-risk) as the underlying time scale.

All PH models are stratified by sex and by these age groups (20 to 34, 35 to 49, 50 to 59, 60 to, 70 to 79, 80 to 89 years of age at baseline).

PH models are adjusted for smoking status (current tobacco and the number of cigarette-equivalents per day [or pack-years] if available/ex/never; or if not possible: current/other).

Studies contributing <10 deaths to a specific analysis will be excluded from that particular analysis to avoid distortions (eg, non-convergence of statistical models) that can appear in analyses involving small strata. HRs will be presented as floating absolute risks.

7. The following analyses are restricted to participants without known history of chronic disease at baseline (as defined in #1):

7a. Study-specific HRs (including standard errors and covariances) will be calculated for the association between BMI categories and all-cause mortality:
i. Stratified by sex and age groups (at baseline), without excluding any follow-up.
ii. Adjusted for smoking, and stratified by sex and age groups, without excluding any follow-up.
iii. Adjusted for smoking, and stratified by sex and age groups, excluding the first 5 years of follow-up. (Optional analyses can also adjust for confounding variables, such as education and marital status, and urban/rural resident).
iv. Stratified by sex and age groups, excluding current and former smokers.
v. Stratified by sex and age groups, excluding current and former smokers and the first 5 years of follow-up (primary analysis).

7b. The 5 analyses described in #7a will be repeated to calculate HRs between BMI categories and all-cause mortality, according to different individual and study-level characteristics:
i. HRs by subgroup of geographical region (no extra analyses required) (primary analysis).
ii. HRs by subgroup of sex and age combined (35 to 49, 50 to 59, 60 to 69, 70 to 79, 80 to 89 years of age at baseline) ie, fitting 10 separate PH models within each sex-specific age group.
iii. If possible, HRs by ethnicity (fitting separate PH models within each ethnicity group).
iv. HRs by subgroup of assessment method (no extra analyses required).

7c. The 5 analyses described in #7a will be repeated to calculate HRs for the association between BMI categories and all-cause mortality, restricting follow-up to up to 15 years.

7d. The 5 analyses described in #7a will be repeated to calculate HRs for the association of BMI categories, where available, with risk of death from
(i) cardiovascular disease,
(ii) CHD,
(iii) stroke,
(iv) cancer, and
(v) respiratory disease,
each censoring deaths from other causes.

8. The 5 analyses described in #7a will be repeated in all participants (without exclusion of people with known disease at baseline) to calculate HRs for the association between BMI categories and all-cause mortality.

9. Study-specific log HRs will be meta-analyzed by geographical regions using multivariate random-effects meta-analysis. Between-study heterogeneity will be quantified by the I^2 statistic. Supplementary analyses will combine log HRs using multivariate fixed-effect meta-analysis.

10. If required, consortia/studies will be contacted for further information or analyses.

3. List of consortia / large studies that had agreed to collaborate in this effort

Asia Cohort Consortium, Asia Pacific Cohort Studies Collaboration, Cancer Prevention Study I, Cancer Prevention Study II, China Prospective Study, Emerging Risk Factors Collaboration, European Prospective Investigation into Cancer and Nutrition (EPIC), National Cancer Institute (NCI) Cohort Consortium, Korean Cancer Prevention Study, Million Women Study, National Health Interview Survey, Nurses' Health Study II, Prospective Studies Collaboration, UK Biobank, 45 and Up

(listed in alphabetical order – updated July 2015)

eAppendix 3: PRISMA-IPD checklist

PRISMA-IPD Section/Topic	Checklist item	Reported on page
Title		
Title	Identify the report as a systematic review and meta-analysis of individual participant data.	1
Abstract		
Structured summary	Provide a structured summary including as applicable:	
	Background: state research question and main objectives, with information on participants, interventions, comparators, and outcomes.	3
	Methods: report eligibility criteria; data sources including dates of last bibliographic search or elicitation, noting that IPD were sought; methods of assessing risk of bias.	3
	Results: provide number and type of studies and participants identified and number (%) obtained; summary effect estimates for main outcomes (benefits and harms) with confidence intervals and measures of statistical heterogeneity. Describe the direction and size of summary effects in terms meaningful to those who would put findings into practice.	3
	Discussion: state main strengths and limitations of the evidence, general interpretation of the results, and any important implications.	3
Introduction		
Rationale	Describe the rationale for the review in the context of what is already known.	4
Objectives	Provide an explicit statement of the questions being addressed with reference, as applicable, to participants, interventions, comparisons, outcomes, and study design (PICOS). Include any hypotheses that relate to particular types of participant-level subgroups.	4
Methods		
Protocol and registration	Indicate if a protocol exists and where it can be accessed. If available, provide registration information including registration number and registry name. Provide publication details, if applicable.	5 and eAppendix 2
Eligibility criteria	Specify inclusion and exclusion criteria including those relating to participants, interventions, comparisons, outcomes, study design, and characteristics (eg, years when conducted, required minimum follow-up). Note whether these were applied at the study or individual level, ie, whether eligible participants were included (and ineligible participants excluded) from a study that included a wider population than specified by the review inclusion criteria. The rationale for criteria should be stated.	5 and eAppendix 4
Identifying studies: information sources	Describe all methods of identifying published and unpublished studies including, as applicable: which bibliographic databases were searched with dates of coverage; details of any hand searching including of conference proceedings; use of study registers and agency or company databases; contact with the original research team and experts in the field; open advertisements; and surveys. Give the date of last search or elicitation.	5, eAppendix 4, and eFigure 1
Identifying studies: search	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	eAppendix 4
Study selection processes	State the process for determining which studies were eligible for inclusion.	5, eAppendix 2, and eAppendix 4
Data collection processes	Describe how IPD were requested, collected, and managed, including any processes for querying and confirming data with investigators. If IPD were not sought from any eligible study, the reason for this should be stated (for each such study).	5, eAppendix 2, and eAppendix 4
	If applicable, describe how any studies for which IPD were not available were dealt with. This should include whether, how, and what aggregate data were sought or extracted from study reports and publications (such as extracting data independently in duplicate) and any processes for obtaining and confirming these data with investigators.	5, 6, 7 and eFigure 1
Data items	Describe how the information and variables to be collected were chosen. List and define all study-level and participant-level data that were sought, including baseline and follow-up information. If applicable, describe methods of standardizing or translating variables within the IPD data sets to ensure common scales or measurements across studies.	eAppendix 2
IPD integrity	Describe what aspects of IPD were subject to data checking (such as sequence generation, data consistency and completeness, baseline imbalance) and how this was done.	eAppendix 2
Risk of bias assessment in individual studies	Describe methods used to assess risk of bias in the individual studies and whether this was applied separately for each outcome. If applicable, describe how findings of IPD checking were used to inform the assessment. Report if and how risk of bias assessment was used in any data synthesis.	eAppendix 2
Specification of outcomes and effect measures	State all treatment comparisons of interest. State all outcomes addressed and define them in detail. State whether they were prespecified for the review and, if applicable, whether they were primary/main or secondary/additional outcomes. Give the principal measures of effect (such as risk ratio, hazard ratio, difference in means) used for each outcome.	5, 6, 7 and eAppendix 2

Synthesis methods	Describe the meta-analysis methods used to synthesize IPD. Specify any statistical methods and models used.	6, 7
Exploration of variation in effects	If applicable, describe any methods used to explore variation in effects by study- or participant-level characteristics (such as estimation of interactions between effect and covariates). State all participant-level characteristics that were analyzed as potential effect modifiers and whether these were prespecified.	6, 7
Risk of bias across studies	Specify any assessment of risk of bias relating to the accumulated body of evidence, including any pertaining to not obtaining IPD for particular studies, outcomes, or other variables.	NA
Additional analyses	Describe methods of any additional analyses, including sensitivity analyses. State which of these were prespecified.	6, 7 and eAppendix 2
Results		
Study selection and IPD obtained	Give numbers of studies screened, assessed for eligibility, and included in the systematic review with reasons for exclusions at each stage. Indicate the number of studies and participants for which IPD were sought and for which IPD were obtained. For those studies for which IPD were not available, give the numbers of studies and participants for which aggregate data were available. Report reasons for nonavailability of IPD. Include a flow diagram.	8, 9, eFigure 1, and eAppendix 2
Study characteristics	For each study, present information on key study and participant characteristics (such as description of interventions, numbers of participants, demographic data, unavailability of outcomes, funding source, and if applicable duration of follow-up). Provide (main) citations for each study. Where applicable, also report similar study characteristics for any studies not providing IPD.	8, 9, eTable 1 and eTable 2
IPD integrity	Report any important issues identified in checking IPD or state that there were none.	8, 9, and eAppendix 2
Risk of bias within studies	Present data on risk of bias assessments. If applicable, describe whether data checking led to the up-weighting or down-weighting of these assessments. Consider how any potential bias affects the robustness of meta-analysis conclusions.	10, eTables 17-23 and eFigures 8-10
Results of individual studies	For each comparison and for each main outcome (benefit or harm), for each individual study report the number of eligible participants for which data were obtained and show simple summary data for each intervention group (including, where applicable, the number of events), effect estimates, and confidence intervals. These may be tabulated or included on a forest plot.	eFigures 8-10
Results of syntheses	Present summary effects for each meta-analysis undertaken, including confidence intervals and measures of statistical heterogeneity. State whether the analysis was prespecified, report the numbers of studies and participants and, where applicable, report the number of events on which it is based.	Table 1, Figures 1-4, and Supplementary material
	When exploring variation in effects due to patient or study characteristics, present summary interaction estimates for each characteristic examined, including confidence intervals and measures of statistical heterogeneity. State whether the analysis was prespecified. State whether any interaction is consistent across trials.	Supplementary material
	Provide a description of the direction and size of effect in terms meaningful to those who would put findings into practice.	Table 1, Figures 1-4, and Supplementary material
Risk of bias across studies	Present results of any assessment of risk of bias relating to the accumulated body of evidence, including any pertaining to the availability and representativeness of available studies, outcomes, or other variables.	Supplementary material
Additional analyses	Additional analyses	Supplementary material
Discussion		
Summary of evidence	Summarize the main findings, including the strength of evidence for each main outcome.	10
Strengths and limitations	Discuss any important strengths and limitations of the evidence, including the benefits of access to IPD and any limitations arising from IPD that were not available.	10-12
Conclusions	Provide a general interpretation of the findings in the context of other evidence.	10-12
Implications	Consider relevance to key groups (such as policy makers, service providers, and service users). Consider implications for future research.	10-12
Funding		
Funding	Describe sources of funding and other support (such as supply of IPD) and the role in the systematic review of those providing such support.	13

eAppendix 4: Systematic literature search procedures

Data Sources and Searches

Studies published between January 1970 and January 2015 were identified, without any language restriction, through electronic searches using MEDLINE, EMBASE and Scopus, and supplemented by scanning reference lists of articles identified and discussion with investigators. The computer-based search strategy is detailed below.

Study Selection and Data Extraction

Prospective observational studies were included if they had reported on the association of body mass index (BMI) and all-cause mortality. Prospective cohort studies or consortia thereof were eligible for inclusion if they satisfied all of the following criteria: 1) had information on weight, height, age and sex; 2) did not select participants on the basis of having previous chronic disease; 3) recorded overall or cause-specific deaths; and 4) had accrued more than 5 years of median follow-up (studies that had less than 5 years of follow-up did not contribute to the primary analysis in this report even if they had contributed to a participating consortium). A literature search flow chart is provided below.

Data on the following characteristics were extracted independently by five investigators (EDA, EP, ES, LOK and NB) according to a pre-specified protocol: full study name, study acronym, study location, and number of participants and number of deaths. Discrepancies were resolved by discussion and by adjudication of a sixth reviewer (PW). We used the most up-to-date or comprehensive information in cases of multiple publications.

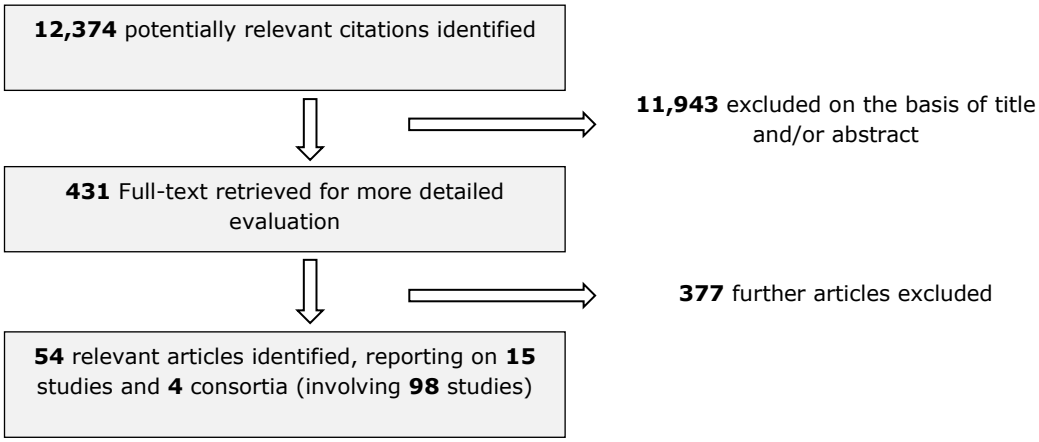
Search strategy

Publication database:	MEDLINE
#1	"Body mass index"
#2	Mortality OR death
#3	"Cohort Studies"[Mesh] OR cohort OR prospective OR "risk ratio" OR "relative risk" OR "hazard ratio" OR "rate ratio" OR "risk ratios" OR "relative risks" OR "hazard ratios" OR "rate ratios"
#4	"Animals"[Mesh] NOT "Humans"[Mesh]
Search:	(#1 AND #2 AND #3) NOT #4
Restrictions:	None
Result:	9,507 citations

Publication database:	EMBASE
#1	("body mass index").af
#2	(mortality OR deaths).af
#3	(cohort OR prospective OR "risk ratio" OR "relative risk" OR "hazard ratio" OR "rate ratio" OR "risk ratios" OR "relative risks" OR "hazard ratios" OR "rate ratios").af
Search:	(#1 AND #2 AND #3)
Restrictions:	None
Result:	7,230 citations

Publication database:	Scopus
#1	TITLE-ABS-KEY ("body mass index")
#2	TITLE-ABS-KEY (mortality OR deaths)
#3	TITLE-ABS-KEY(cohort OR prospective OR "risk ratio" OR "relative risk" OR "hazard ratio" OR "rate ratio" OR "risk ratios" OR "relative risks" OR "hazard ratios" OR "rate ratios")
Search:	(#1 AND #2 AND #3)
Restrictions:	None
Result:	7,053 citations

Literature search flow chart



eAppendix 5: References

1. Ulmer H, Kelleher C, Diem G, Concin H. Long-term tracking of cardiovascular risk factors among men and women in a large population-based health system. *European heart journal.* 2003;24(11):1004-1013.
2. De Henauw S, De Bacquer D, Fonteyne W, Stam M, Kornitzer M, De Backer G. Trends in the prevalence, detection, treatment and control of arterial hypertension in the Belgian adult population. *Journal of hypertension.* 1998;16(3):277-284.
3. Zhang H, Thijs L, Kuznetsova T, Fagard RH, Li X, Staessen JA. Progression to hypertension in the non-hypertensive participants in the Flemish Study on Environment, Genes and Health Outcomes. *Journal of hypertension.* 2006;24(9):1719-1727.
4. Keys A. Coronary heart disease in seven countries. 1970. *Nutrition (Burbank, Los Angeles County, Calif.).* 1997;13(3):250-252; discussion 249, 253.
5. Appleyard M. *The Copenhagen City Heart Study: Østerbroundersøgelsen: a book of tables with data from the first examination (1976-78) and a five year follow-up (1981-83).* Copenhagen City Heart Study Group. Medical Department B, Rigshospitalet, University Hospital of Copenhagen; 1988.
6. Schroll M, Jørgensen T, Ingerslev J. The Glostrup Population Studies, 1964-1992. *Danish medical bulletin.* 1992;39(3):204-207.
7. Reunanen A, Aromaa A, Pyorala K, Punsar S, Maatela J, Knekt P. The Social Insurance Institution's Coronary Heart Disease Study. *Acta Med Scand.* 1983;673(Suppl):1-120.
8. Pajunen P, Vartiainen E, Männistö S, Jousilahti P, Laatikainen T, Peltonen M. Intra-individual changes in body weight in population-based cohorts during four decades: the Finnish FINRISK study. *The European Journal of Public Health.* 2012;22(1):107-112.
9. Hakala S, Tilvis R, Strandberg T. Blood pressure and mortality in an older population. *Eur Heart J.* 1997;18:1019-1023.
10. Strandberg TE, Salomaa VV, Vanhanen HT, Naukkarinen VA, Sarna S, Miettinen TA. Mortality in participants and non-participants of a multifactorial prevention study of cardiovascular diseases: a 28 year follow up of the Helsinki Businessmen Study. *British heart journal.* 1995;74(4):449-454.
11. Myk L, Laakso M, Penttilä I, Pyörälä K. Asymptomatic hyperglycemia and cardiovascular risk factors in the elderly. *Atherosclerosis.* 1991;88(2):153-161.
12. Nissinen A, Tuomilehto J, Elo J, Salonen JT, Puska P. Implementation of a hypertension control program in the county of North Karelia, Finland. *Public Health Reports.* 1981;96(6):503.
13. Thomas F, Pannier B, Benetos A, Vischer UM. The impact of the metabolic syndrome–but not of hypertension–on all-cause mortality disappears in the elderly. *Journal of hypertension.* 2011;29(4):663-668.
14. Balkau B, Lange C, Fezeu L, et al. Predicting diabetes: clinical, biological, and genetic approaches data from the epidemiological study on the insulin resistance syndrome (DESIR). *Diabetes care.* 2008;31(10):2056-2061.
15. Fontbonne AM, Eschwège EM. Insulin and cardiovascular disease: Paris prospective study. *Diabetes care.* 1991;14(6):461-469.
16. Wagner A, Simon C, Evans A, et al. Physical Activity and Coronary Event Incidence in Northern Ireland and France The Prospective Epidemiological Study of Myocardial Infarction (PRIME). *Circulation.* 2002;105(19):2247-2252.
17. Löw M, Stegmaier C, Ziegler H, Rothenbacher D, Brenner H. Epidemiological investigations of the chances of preventing, recognizing early and optimally treating chronic diseases in an elderly population (ESTHER study). *Deutsche medizinische Wochenschrift (1946).* 2004;129(49):2643-2647.
18. Cremer P, Elster H, Labrot B, Kruse B, Muche R, Seidel D. Incidence rates of fatal and nonfatal myocardial infarction in relation to the lipoprotein profile: first prospective results from the Göttingen Risk, Incidence and Prevalence Study (GRIPS). *Klin Wochenschr.* 1988;66(Suppl XI):42-49.
19. Wilhelmsen L, Johansson S, Rosengren A, Wallin I, Dotevall A, Lappas G. Risk factors for cardiovascular disease during the period 1985–1995 in Göteborg, Sweden. The GOT-MONICA Project. *Journal of internal medicine.* 1997;242(3):199-211.
20. Assmann G, Cullen P, Heinrich J, Schulte H. Hemostatic variables in the prediction of coronary risk: results of the 8 year follow-up of healthy men in the Munster Heart Study (PROCAM). Prospective Cardiovascular Munster Study. *Israel journal of medical sciences.* 1996;32(6):364-370.
21. John U, Hensel E, Lüdemann J, et al. Study of Health In Pomerania (SHIP): a health examination survey in an east German region: objectives and design. *Sozial-und Präventivmedizin.* 2001;46(3):186-194.
22. Claessen H, Arndt V, Drath C, Brenner H. Overweight, obesity and risk of work disability: a cohort study of construction workers in Germany. *Occupational and environmental medicine.* 2009;66(6):402-409.
23. Panagiotakos DB, Pitsavos C, Chrysohoou C, et al. Epidemiology of overweight and obesity in a Greek adult population: the ATTICA Study. *Obesity Research.* 2004;12(12):1914-1920.
24. Sigurdsson E, Thorgeirsson G, Sigvaldason H, Sigfusson N. Prevalence of coronary heart disease in Icelandic men 1968–1986. *European heart journal.* 1993;14(5):584-591.
25. BIP Study Group. Secondary Prevention by Raising HDL Cholesterol and Reducing Triglycerides in Patients With Coronary Artery Disease The Bezafibrate Infarction Prevention (BIP) Study. *Circulation.* 2000;102(1):21-27.
26. Tanne D, Yaari S, Goldbourt U. High-Density Lipoprotein Cholesterol and Risk of Ischemic Stroke Mortality A 21-Year Follow-up of 8586 Men From the Israeli Ischemic Heart Disease Study. *Stroke.* 1997;28(1):83-87.
27. Modan M, Halkin H, Almog S, et al. Hyperinsulinemia. A link between hypertension obesity and glucose intolerance. *Journal of clinical investigation.* 1985;75(3):809.
28. Willeit J, Kiechl S. Prevalence and risk factors of asymptomatic extracranial carotid artery atherosclerosis. A population-based study. *Arteriosclerosis, Thrombosis, and Vascular Biology.* 1993;13(5):661-668.

29. Casiglia E, Spolaore P, Mormino P, et al. The CASTEL project (CArdiovascular STudy in the ELderly): protocol, study design, and preliminary results of the initial survey. *Cardiologia (Rome, Italy).* 1991;36(7):569-576.
30. Menotti A, Spagnolo A, Dima F, Meli P, Scanga M. The prediction of coronary heart disease in different population samples. *European journal of epidemiology.* 1992;8(4):521-526.
31. Fornari C, Donfrancesco C, Riva MA, et al. Social status and cardiovascular disease: a Mediterranean case. Results from the Italian Progetto CUORE cohort study. *BMC public health.* 2010;10(1):574.
32. Trevisan M, Schisterman E, Mennotti A, Farchi G, Conti S. Drinking Pattern and Mortality:: The Italian Risk Factor and Life Expectancy Pooling Project. *Annals of Epidemiology.* 2001;11(5):312-319.
33. Rodeghiero F, Tosetto A. The epidemiology of inherited thrombophilia: the VITA Project. Vicenza Thrombophilia and Atherosclerosis Project. *Thrombosis and haemostasis.* 1997;78(1):636-640.
34. Visscher T, Kromhout D, Seidell J. Long-term and recent time trends in the prevalence of obesity among Dutch men and women. *International journal of obesity and related metabolic disorders: journal of the International Association for the Study of Obesity.* 2002;26(9):1218-1224.
35. Mooy JM, Grootenhuis PA, de Vries H, et al. Prevalence and determinants of glucose intolerance in a Dutch Caucasian population: the Hoorn Study. *Diabetes care.* 1995;18(9):1270-1273.
36. Deeg D, Comijs H, Thomése G, Visser M. [The Longitudinal Ageing Study Amsterdam: a survey of 17 years of research into changes in daily functioning]. *Tijdschrift voor gerontologie en geriatrie.* 2009;40(6):217-227.
37. Klungel OH, de Boer A, Paes AH, Seidell JC, Bakker A. Cardiovascular diseases and risk factors in a population-based study in The Netherlands: agreement between questionnaire information and medical records. *The Netherlands journal of medicine.* 1999;55(4):177-183.
38. Hillege HL, Fidler V, Diercks GF, et al. Urinary albumin excretion predicts cardiovascular and noncardiovascular mortality in general population. *Circulation.* 2002;106(14):1777-1782.
39. Hofman A, Murad SD, van Duijn CM, et al. The Rotterdam Study: 2014 objectives and design update. *European journal of epidemiology.* 2013;28(11):889-926.
40. Rabanal KS, Lindman AS, Selmer RM, Aamodt G. Ethnic differences in risk factors and total risk of cardiovascular disease based on the Norwegian CONOR study. *European journal of preventive cardiology.* 2013;20(6):1013-1021.
41. Lindman AS, Veierød M, Tverdal A, Pedersen J, Selmer R. Nonfasting triglycerides and risk of cardiovascular death in men and women from the Norwegian Counties Study. *European journal of epidemiology.* 2010;25(11):789-798.
42. Holme I. Long-term survival in pre-specified groups at risk in the Oslo Study, 1972–1973. *Scandinavian journal of public health.* 2015:1403494814558157.
43. Jacobsen BK, Eggen AE, Mathiesen EB, Wilsgaard T, Njølstad I. Cohort profile: the Tromsø study. *International journal of epidemiology.* 2011:dyr049.
44. Fowkes F, Housley E, Cawood E, Macintyre C, Ruckley C, Prescott R. Edinburgh Artery Study: prevalence of asymptomatic and symptomatic peripheral arterial disease in the general population. *International journal of epidemiology.* 1991;20(2):384-392.
45. Shepherd J, Blauw GJ, Murphy MB, et al. The design of a prospective study of pravastatin in the elderly at risk (PROSPER). *The American journal of cardiology.* 1999;84(10):1192-1197.
46. Ballesteros-Pomar M, Rubio-Herrera M, Gutiérrez-Fuentes J, et al. Dietary habits and cardiovascular risk in the Spanish population: the DRECE study (I). *Annals of nutrition and metabolism.* 2000;44(3):108-114.
47. Lobo A, Saz P, Marcos G, Día J-L, De-la-Cámara C. The prevalence of dementia and depression in the elderly community in a southern european population: the Zaragoza study. *Archives of General Psychiatry.* 1995;52(6):497-506.
48. Walldius G, Jungner I, Kolar W, Holme I, Steiner E. High cholesterol and triglyceride values in Swedish males and females: increased risk of fatal myocardial infarction. First report from the AMORIS (Apolipoprotein related MOrtality RISk) study. *Blood pressure. Supplement.* 1991;4:35-42.
49. Larsson SC, Giovannucci E, Wolk A. Diabetes and colorectal cancer incidence in the cohort of Swedish men. *Diabetes Care.* 2005;28(7):1805-1807.
50. Rosengren A, Eriksson H, Larsson B, et al. Secular changes in cardiovascular risk factors over 30 years in Swedish men aged 50: the study of men born in 1913, 1923, 1933 and 1943. *Journal of internal medicine.* 2000;247(1):111-118.
51. Berglund G, Eriksson K, Israelsson B, et al. Cardiovascular risk groups and mortality in an urban Swedish male population: the Malmö Preventive Project. *Journal of internal medicine.* 1996;239(6):489-497.
52. Blomstrand A, Blomstrand C, Ariai N, Bengtsson C, Björkelund C. Stroke incidence and association with risk factors in women: a 32-year follow-up of the Prospective Population Study of Women in Gothenburg. *BMJ open.* 2014;4(10):e005173.
53. Wolk A, Larsson SC, Johansson J-E, Ekman P. Long-term fatty fish consumption and renal cell carcinoma incidence in women. *Jama.* 2006;296(11):1371-1376.
54. Lind L, Vessby B, Sundström J. The apolipoprotein B/AI ratio and the metabolic syndrome independently predict risk for myocardial infarction in middle-aged men. *Arteriosclerosis, thrombosis, and vascular biology.* 2006;26(2):406-410.
55. Kumle M, Weiderpass E, Braaten T, Persson I, Adami H-O, Lund E. Use of oral contraceptives and breast cancer risk the Norwegian-Swedish women's lifestyle and Health Cohort Study. *Cancer Epidemiology Biomarkers & Prevention.* 2002;11(11):1375-1381.
56. Onat A, Şenocak MŞ. Relative risk of factors for coronary heart disease in population with low cholesterol levels. *International journal of cardiology.* 1994;43(1):51-60.
57. Kapetanakis VV, Rudnicka AR, Wathern AK, et al. Adiposity in Early, Middle and Later Adult Life and Cardiometabolic Risk Markers in Later Life; Findings from the British Regional Heart Study. *PloS one.* 2014;9(12):e114289.
58. Kalina MA. B.U.P.A. (British United Provident Association). *Lancet (London, England).* 1972;1(7740):44-45.

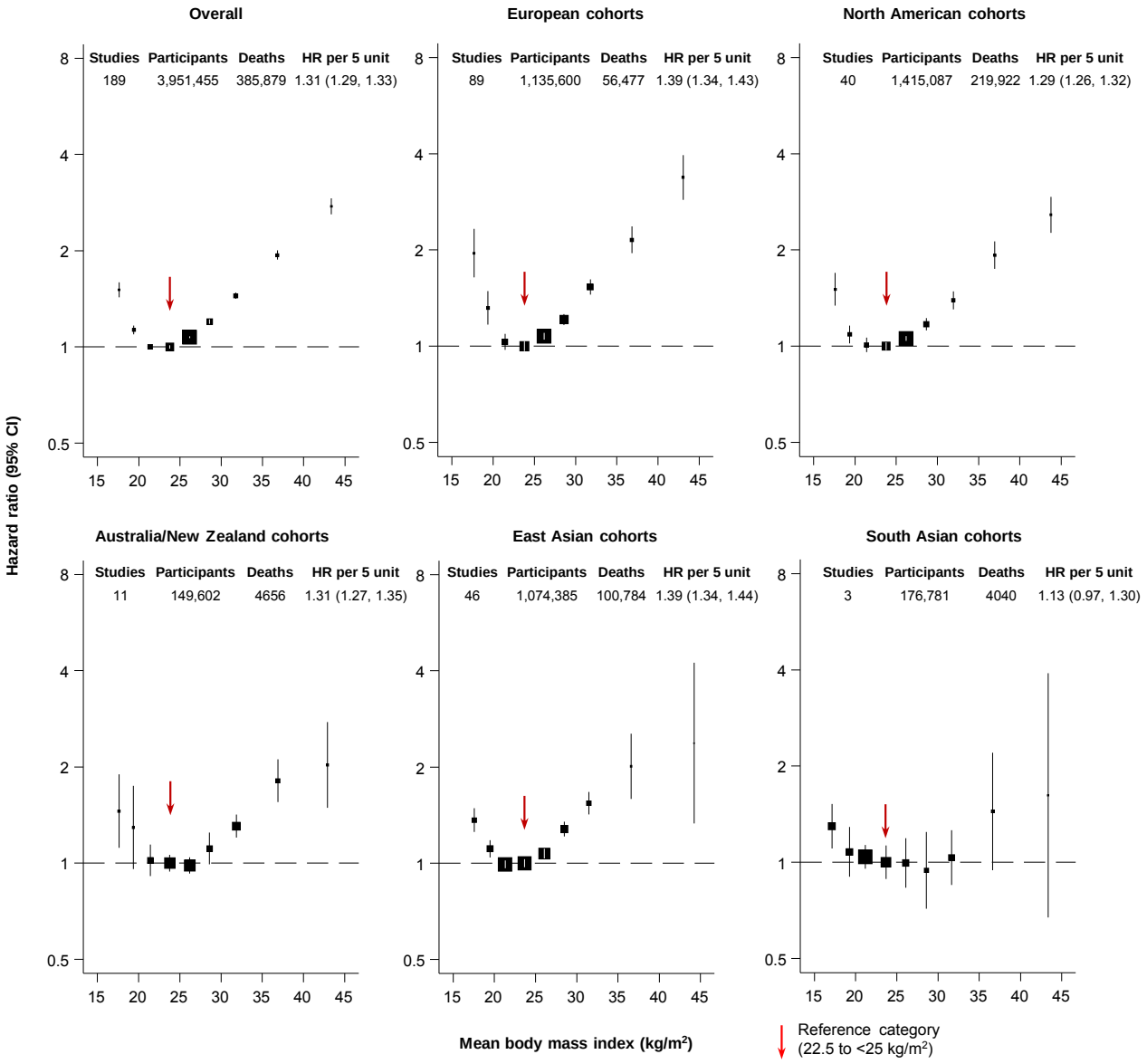
59. Lawlor D, Bedford C, Taylor M, Ebrahim S. Geographical variation in cardiovascular disease, risk factors, and their control in older women: British Women's Heart and Health Study. *Journal of Epidemiology and Community Health.* 2003;57(2):134-140.
60. The Caerphilly and Speedwell Collaborative Group. Caerphilly and Speedwell collaborative heart disease studies. *Journal of epidemiology and community health.* 1984;38(3):259-262.
61. Syddall H, Sayer AA, Dennison E, Martin H, Barker D, Cooper C. Cohort profile: the Hertfordshire cohort study. *International journal of epidemiology.* 2005;34(6):1234-1242.
62. Meade TW. Design and intermediate results of the Lower Extremity Arterial Disease Event Reduction (LEADER)* trial of bezafibrate in men with lower extremity arterial disease [ISRCTN41194621]. *Trials.* 2001;2(4):195.
63. Upton MN, McConnachie A, McSharry C, et al. Intergenerational 20 year trends in the prevalence of asthma and hay fever in adults: the Midspan family study surveys of parents and offspring. *Bmj.* 2000;321(7253):88-92.
64. Million Women Study Collaborative Group. The Million Women Study: design and characteristics of the study population. *Breast Cancer Research.* 1999;1(1):73.
65. Fletcher A, Jones D, Bulpitt C, Tulloch A. The MRC trial of assessment and management of older people in the community: objectives, design and interventions [ISRCTN23494848]. *BMC health services research.* 2002;2(1):21.
66. Hart CL, Smith GD. Alcohol consumption and mortality and hospital admissions in men from the Midspan Collaborative cohort study. *Addiction.* 2008;103(12):1979-1986.
67. Meade TW, Stirling Y. The Northwick Park Heart Studies: contrasts between the two factor VII assays used. J Thromb Haemost. 2012;10(3):482-4.
68. Hawthorne V, Watt G, Hart C, Hole D, Smith GD, Gillis C. Cardiorespiratory disease in men and women in urban Scotland: baseline characteristics of the Renfrew/Paisley (Midspan) Study population. *Scottish Medical Journal.* 1995;40(4):102-107.
69. Tunstall-Pedoe H, Woodward M, Tavendale R, A'Brook R, McCluskey MK. Comparison of the prediction by 27 different factors of coronary heart disease and death in men and women of the Scottish Heart Health Study: cohort study. *Bmj.* 1997;315(7110):722-729.
70. Rudnicka A, MT-ISA S, Meade T. Associations of plasma fibrinogen and factor VII clotting activity with coronary heart disease and stroke: prospective cohort study from the screening phase of the Thrombosis Prevention Trial. *Journal of Thrombosis and Haemostasis.* 2006;4(11):2405-2410.
71. Sudlow C, Gallacher J, Allen N, et al. UK biobank: an open access resource for identifying the causes of a wide range of complex diseases of middle and old age. *PLoS medicine.* 2015;12(3):e1001779.
72. Rose G, Tunstall-Pedoe H, Heller R. UK heart disease prevention project: incidence and mortality results. *The Lancet.* 1983;321(8333):1062-1066.
73. Liao J. Long-term follow-up of the West of Scotland Coronary Prevention Study. *Current atherosclerosis reports.* 2008;10(4):283.
74. Marmot MG, Shipley MJ, Rose G. Inequalities in death—specific explanations of a general pattern? *The Lancet.* 1984;323(8384):1003-1006.
75. Hinnouho G-M, Czernichow S, Dugravot A, et al. Metabolically healthy obesity and the risk of cardiovascular disease and type 2 diabetes: the Whitehall II cohort study. *European heart journal.* 2015;36(9):551-559.
76. Riboli E, Hunt K, Slimani N, et al. European Prospective Investigation into Cancer and Nutrition (EPIC): study populations and data collection. *Public health nutrition.* 2002;5(6b):1113-1124.
77. Davidson KW, Schwartz JE, Kirkland SA, et al. Relation of inflammation to depression and incident coronary heart disease (from the Canadian Nova Scotia Health Survey [NSHS95] Prospective Population Study). *The American journal of cardiology.* 2009;103(6):755-761.
78. DaGenais GR, Robitaille NM, Lupien PJ, et al. First coronary heart disease event rates in relation to major risk factors: Québec Cardiovascular Study. *The Canadian journal of cardiology.* 1990;6(7):274-280.
79. Alavanja MC, Sandler DP, McMaster SB, et al. The Agricultural Health Study. *Environmental health perspectives.* 1996;104(4):362.
80. Downs JR, Clearfield M, Tyroler HA, et al. Air Force/Texas Coronary Atherosclerosis Prevention Study (AFCAPS/TEXCAPS): additional perspectives on tolerability of long-term treatment with lovastatin. *The American journal of cardiology.* 2001;87(9):1074-1079.
81. Schatzkin A, Subar AF, Thompson FE, et al. Design and Serendipity in Establishing a Large Cohort with Wide Dietary Intake Distributions The National Institutes of Health–American Association of Retired Persons Diet and Health Study. *American journal of epidemiology.* 2001;154(12):1119-1125.
82. Szklo M, Barnes R, Folsom A, et al. The Atherosclerosis Risk in Communities (ARIC) Study: design and objectives. The ARIC investigators. *American Journal of Epidemiology.* 1989;129(4):687-702.
83. Mai V, Flood A, Peters U, Lacey JV, Schairer C, Schatzkin A. Dietary fibre and risk of colorectal cancer in the Breast Cancer Detection Demonstration Project (BCDDP) follow-up cohort. *International journal of epidemiology.* 2003;32(2):234-239.
84. Torio CM, Klassen AC, Curriero FC, Caballero B, Helzlsouer K. The modifying effect of social class on the relationship between body mass index and breast cancer incidence. *American journal of public health.* 2010;100(1):146.
85. Link LB, Canchola AJ, Bernstein L, et al. Dietary patterns and breast cancer risk in the California Teachers Study cohort. *The American journal of clinical nutrition.* 2013;98(6):1524-1532.
86. Garfinkel L, Heath C. Cancer Prevention Study II: the American Cancer Society prospective study. *Stat Bull.* 1992;73:21-29.
87. Suchy-Dicey AM, Wallace ER, Elkind MS, et al. Blood pressure variability and the risk of all-cause mortality, incident myocardial infarction, and incident stroke in the cardiovascular health study. *American journal of hypertension.* 2013:hpt092.

88. Boyle E. Biological patterns in hypertension by race, sex, body weight, and skin color. *Jama.* 1970;213(10):1637-1643.
89. Miura K, Daviglus ML, Dyer AR, et al. Relationship of blood pressure to 25-year mortality due to coronary heart disease, cardiovascular diseases, and all causes in young adult men: the Chicago Heart Association Detection Project in Industry. *Archives of Internal Medicine.* 2001;161(12):1501-1508.
90. Cornoni-Huntley J, Ostfeld AM, Taylor JO, et al. Established populations for epidemiologic studies of the elderly: study design and methodology. *Aging (Milan, Italy).* 1993;5(1):27-37.
91. Rutter MK, Meigs JB, Sullivan LM, D'Agostino RB, Wilson PW. C-reactive protein, the metabolic syndrome, and prediction of cardiovascular events in the Framingham Offspring Study. *Circulation.* 2004;110(4):380-385.
92. Pai JK, Mukamal KJ, Rimm EB. Long-term alcohol consumption in relation to all-cause and cardiovascular mortality among survivors of myocardial infarction: the Health Professionals Follow-up Study. *European heart journal.* 2012;33(13):1598-1605.
93. Kagan A, Harris BR, Winkelstein W, et al. Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: demographic, physical, dietary and biochemical characteristics. *Journal of chronic diseases.* 1974;27(7):345-364.
94. Folsom AR, Kushi LH, Anderson KE, et al. Associations of general and abdominal obesity with multiple health outcomes in older women: the Iowa Women's Health Study. *Arch Intern Med.* 2000;160(14):2117-2128.
95. Friedman LA, Morrison JA, Daniels SR, McCarthy WF, Sprecher DL. Sensitivity and specificity of pediatric lipid determinations for adult lipid status: findings from the Princeton Lipid Research Clinics Prevalence Program Follow-up Study. *Pediatrics.* 2006;118(1):165-172.
96. Luepker RV, Murray DM, Jacobs Jr DR, et al. Community education for cardiovascular disease prevention: risk factor changes in the Minnesota Heart Health Program. *American journal of public health.* 1994;84(9):1383-1393.
97. Luepker RV, Jacobs DR, Gillum RF, Folsom AR, Prineas RJ, Blackburn H. Population risk of cardiovascular disease: the Minnesota Heart Survey. *Journal of chronic diseases.* 1985;38(8):671-682.
98. Bild DE, Bluemke DA, Burke GL, et al. Multi-ethnic study of atherosclerosis: objectives and design. *American journal of epidemiology.* 2002;156(9):871-881.
99. Stamler J, Neaton JD, Cohen JD, et al. Multiple risk factor intervention trial revisited: a new perspective based on nonfatal and fatal composite endpoints, coronary and cardiovascular, during the trial. *Journal of the American Heart Association.* 2012;1(5):e003640.
100. Sacco R, Wolf PA, Kannel W, McNamara P. Survival and recurrence following stroke. The Framingham study. *Stroke.* 1982;13(3):290-295.
101. Kato I, Akhmedkhanov A, Koenig K, Toniolo PG, Shore RE, Riboli E. Prospective study of diet and female colorectal cancer: the New York University Women's Health Study. 1997.
102. Idler EL, Russell LB, Davis D. Survival, functional limitations, and self-rated health in the NHANES I epidemiologic follow-up study, 1992. *American journal of epidemiology.* 2000;152(9):874-883.
103. Gillum R, Obisesan TO. Physical activity, cognitive function, and mortality in a US national cohort. *Annals of epidemiology.* 2010;20(4):251-257.
104. Pleis JR, Lucas JW, Ward BW. Summary health statistics for U.S. adults: National Health Interview Survey, 2008. *Vital and health statistics. Series 10, Data from the National Health Survey.* 2009(242):1-157.
105. Zhang C, Rexrode KM, van Dam RM, Li TY, Hu FB. Abdominal obesity and the risk of all-cause, cardiovascular, and cancer mortality sixteen years of follow-up in US women. *Circulation.* 2008;117(13):1658-1667.
106. Belanger CF, Hennekens CH, Rosner B, Speizer FE. The nurses' health study. *AJN The American Journal of Nursing.* 1978;78(6):1039-1040.
107. Andriole GL, Crawford ED, Grubb RL, et al. Prostate cancer screening in the randomized Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial: mortality results after 13 years of follow-up. *Journal of the National Cancer Institute.* 2012.
108. Hennekens C. Final report on the aspirin component of the ongoing Physicians Health Study. *New England Journal of Medicine.* 1989;321(3):129-135.
109. Garcia-Palmieri M, Feliberti M, Costas Jr R, et al. An epidemiological study on coronary heart disease in Puerto Rico: The Puerto Rico Heart Health Program. *Boletin de la Asociacion Medica de Puerto Rico.* 1969;61(6):174-179.
110. Barrett-Connor E. Why Women Have Less Heart Disease Than Men and How Diabetes Modifies Women's Usual Cardiac Protection: A 40-Year Rancho Bernardo Cohort Study. *Global heart.* 2013;8(2):95-104.
111. Wynder EL, Lemon FR, Bross IJ. Cancer and coronary artery disease among seventh-day adventists. *Cancer.* 1959;12(5):1016-1028.
112. Lee ET, Welty TK, Fabsitz R, et al. The Strong Heart Study A study of cardiovascular disease in American Indians: design and methods. *American journal of epidemiology.* 1990;132(6):1141-1155.
113. Napier JA, Metzner H, Johnson BC. Limitations of morbidity and mortality data obtained from family histories--a report from the Tecumseh community health study. *American journal of public health.* 1972;62(1):30-35.
114. Boice Jr JD, Mandel JS, Doody MM, Yoder RC, McGowan R. A health survey of radiologic technologists. *Cancer.* 1992;69(2):586-598.
115. Greenlee H, White E, Patterson RE, Kristal AR. Supplement use among cancer survivors in the Vitamins and Lifestyle (VITAL) study cohort. *Journal of Alternative & Complementary Medicine.* 2004;10(4):660-666.
116. Hsia J, Aragaki A, Bloch M, LaCroix AZ, Wallace R, Investigators W. Predictors of angina pectoris versus myocardial infarction from the Women's Health Initiative Observational Study. *The American journal of cardiology.* 2004;93(6):673-678.
117. Rexrode KM, Lee I-M, Cook NR, Hennekens CH, Buring JE. Baseline characteristics of participants in the Women's Health Study. *Journal of women's health & gender-based medicine.* 2000;9(1):19-27.

118. Einhorn PT, Davis BR, Massie BM, et al. The Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) heart failure validation study: diagnosis and prognosis. *American heart journal.* 2007;153(1):42-53.
119. Banks E, Redman S, Jorm L, et al. Cohort profile: the 45 and up study. *International journal of epidemiology.* 2008;37(5):941-947.
120. Collaborative Aneurysm Screening Study Group. A comparative study of the prevalence of abdominal aortic aneurysms in the United Kingdom, Denmark, and Australia. *Journal of medical screening.* 2001;8(1):46-50.
121. Dunstan DW, Zimmet PZ, Welborn TA, et al. The Australian diabetes, obesity and lifestyle study (AusDiab)—methods and response rates. *Diabetes research and clinical practice.* 2002;57(2):119-129.
122. Andrews G, Cheok F, Carr S. The Australian longitudinal study of ageing. *Australian Journal on Ageing.* 1989;8(2):31-35.
123. Zhu K, Hunter M, James A, Lim EM, Walsh JP. Associations between body mass index, lean and fat body mass and bone mineral density in middle-aged Australians: The Busselton Healthy Ageing Study. *Bone.* 2015;74:146-152.
124. Simons LA, Simons J, Friedlander Y, McCallum J. Usefulness of fasting plasma glucose to predict mortality or coronary heart disease in persons≥ 60 years of age without diabetes mellitus or in those with undiagnosed diabetes mellitus (from The Dubbo Study). *The American journal of cardiology.* 2008;102(7):831-834.
125. Norman PE, Flicker L, Almeida OP, Hankey GJ, Hyde Z, Jamrozik K. Cohort profile: the health in men study (HIMS). *International Journal of Epidemiology.* 2009;38(1):48-52.
126. Bennett SA, Magnus P. Trends in cardiovascular risk factors in Australia. Results from the National Heart Foundation's Risk Factor Prevalence Study, 1980-1989. *The Medical Journal of Australia.* 1994;161(9):519-527.
127. Huxley R, Barzi F, Stolk R, et al. Ethnic comparisons of obesity in the Asia-Pacific region: protocol for a collaborative overview of cross-sectional studies. *Obesity reviews: an official journal of the International Association for the Study of Obesity.* 2005;6(3):193-198.
128. Norman PE, Jamrozik K, Lawrence-Brown MM, et al. Population based randomised controlled trial on impact of screening on mortality from abdominal aortic aneurysm. *Bmj.* 2004;329(7477):1259.
129. Giles G, English D, Riboli E, Lambert R. The Melbourne Collaborative Cohort Study. Paper presented at: Nutrition and lifestyle: opportunities for cancer prevention. European Conference on Nutrition and Cancer held in Lyon, France on 21-24 June, 2003.2002.
130. Jiang J, Tang Z, Meng XJ, Futatsuka M. Demographic determinants for change in activities of daily living: a cohort study of the elderly people in Beijing. *Journal of Epidemiology.* 2002;12(3):280-286.
131. Wu X, Gu D, Wu Y, et al. [An evaluation on effectiveness of worksite-based intervention for cardiovascular disease during 1974-1998 in capital iron and steel company of Beijing]. *Zhonghua yu fang yi xue za zhi [Chinese journal of preventive medicine].* 2003;37(2):93-97.
132. Wu X, Duan X, Gu D, Hao J, Tao S, Fan D. Prevalence of hypertension and its trends in Chinese populations. *International journal of cardiology.* 1995;52(1):39-44.
133. Yang L, Yang G, Zhou M, et al. Body mass index and mortality from lung cancer in smokers and nonsmokers: a nationally representative prospective study of 220,000 men in China. *International journal of cancer.* 2009;125(9):2136-2143.
134. Wu N, Tang X, Wu Y, et al. Cohort profile: the Fangshan Cohort Study of cardiovascularepidemiology in Beijing, China. *Journal of epidemiology.* 2014;24(1):84.
135. Blot WJ, Li J-Y, Taylor PR, et al. Nutrition intervention trials in Linxian, China: supplementation with specific vitamin/mineral combinations, cancer incidence, and disease-specific mortality in the general population. *Journal of the national cancer institute.* 1993;85(18):1483-1491.
136. Tao L, Wang R, Gao Y-T, Yuan J-M. Impact of postdiagnosis smoking on long-term survival of cancer patients: the Shanghai Cohort Study. *Cancer epidemiology biomarkers & prevention.* 2013;22(12):2404-2411.
137. Shu X-O, Li H, Yang G, et al. Cohort Profile: The Shanghai Men's Health Study. *International journal of epidemiology.* 2015:dyv013.
138. Zheng W, Chow W-H, Yang G, et al. The Shanghai Women's Health Study: rationale, study design, and baseline characteristics. *American journal of epidemiology.* 2005;162(11):1123-1131.
139. Geng G. Serial epidemiological study of hypertension in Tianjin. *Zhonghua liu xing bing xue za zhi= Zhonghua liuxingbingxue zazhi.* 1989;10(2):70-73.
140. Xiang-Zhen X, Lubin JH, Jun-Yao L, et al. A cohort study in southern China of tin miners exposed to radon and radon decay products. *Health physics.* 1993;64(2):120-131.
141. Zhang W, Jiang C, Lam T, et al. A prospective cohort study on the effect of occupational dust exposure and smoking on mortality. *Chinese journal of industrial hygiene and occupational diseases.* 2002;20(5):365-368.
142. Ho SC, Woo J, Sham A, Chan SG, Ashley L. A 3-year follow-up study of social, lifestyle and health predictors of cognitive impairment in a Chinese older cohort. *International Journal of Epidemiology.* 2001;30(6):1389-1396.
143. Tamakoshi A, Ohno Y, Yamada T, et al. Depressive mood and suicide among middle-aged workers: findings from a prospective cohort study in Nagoya, Japan. *Journal of epidemiology.* 2000;10(3):173-178.
144. Tominaga M, Eguchi H, Manaka H, Igarashi K, Kato T, Sekikawa A. Impaired glucose tolerance is a risk factor for cardiovascular disease, but not impaired fasting glucose. The Funagata Diabetes Study. *Diabetes care.* 1999;22(6):920-924.
145. Hata J, Ninomiya T, Hirakawa Y, et al. Secular trends in cardiovascular disease and its risk factors in Japanese: half century data from the Hisayama Study (1961-2009). *Circulation.* 2013:CIRCULATIONAHA. 113.002424.
146. Matsuo T, Sairenchi T, Iso H, et al. Age-and gender-specific BMI in terms of the lowest mortality in Japanese general population. *Obesity.* 2008;16(10):2348-2355.
147. Imano H, Iso H, Sato S, et al. Determinants of platelet aggregation in 50–70-year-old men from three Japanese communities. *Atherosclerosis.* 2002;165(2):327-334.

148. Tamakoshi A, Yoshimura T, Inaba Y, et al. Profile of the JACC Study. *Journal of epidemiology.* 2005;15 (Supplement_I):S4-S8.
149. Tsugane S, Sobue T. Baseline survey of JPHC study design and participation rate. *Journal of epidemiology.* 2001;11(6sup):24-29.
150. Tomita M, Mizuno S, Yamanaka H, et al. Does hyperuricemia aeffect mortality? A prospective cohort study of Japanese male workers. *Journal of epidemiology.* 2000;10(6):403-409.
151. Kodama K, Ozasa K, Katayama H, Shore RE, Okubo T. Radiation effects on cancer risks in the life span study cohort. *Radiation protection dosimetry.* 2012:ncs180.
152. Tsuji I, Nishino Y, Tsubono Y, et al. Follow-up and mortality profiles in the Miyagi Cohort Study. *Journal of Epidemiology.* 2004;14(Supplement_I):S2-S6.
153. Kasamatsu T, Morioka S, Hashimoto T, Kinoshita H, Yamada H, Tamaki T. Epidemiological study on the bone mineral density of inhabitants in Miyama Village, Wakayama Prefecture (Part I) Background of study population and sampling method. *Journal of Bone and Mineral Metabolism.* 1991;9(1):50-55.
154. Ohkubo T, Imai Y, Tsuji I, et al. Home blood pressure measurement has a stronger predictive power for mortality than does screening blood pressure measurement: a population-based observation in Ohasama, Japan. *Journal of hypertension.* 1998;16(7):971-975.
155. Tsuji I, Nishino Y, Ohkubo T, et al. A prospective cohort study on national health insurance beneficiaries in Ohsaki, Miyagi Prefecture, Japan: study design, profiles of the subjects and medical cost during the first year. *Journal of epidemiology.* 1998;8(5):258-263.
156. Sato S, Nakamura M, Iida M, et al. Plasma fibrinogen and coronary heart disease in urban Japanese. *American journal of epidemiology.* 2000;152(5):420-423.
157. Soyama Y, Miura K, Morikawa Y, et al. High-Density Lipoprotein Cholesterol and Risk of Stroke in Japanese Men and Women The Oyabe Study. *Stroke.* 2003;34(4):863-868.
158. Imai K, Nakachi K. Cross sectional study of effects of drinking green tea on cardiovascular and liver diseases. *Bmj.* 1995;310(6981):693-696.
159. Nakayama T, Date C, Yokoyama T, Yoshiike N, Yamaguchi M, Tanaka H. A 15.5-year follow-up study of stroke in a Japanese provincial city The Shibata Study. *Stroke.* 1997;28(1):45-52.
160. Nozaki A, Hirao K, Sugimoto C, et al. A comparative study of the health conditions of elderly people living alone, elderly couples and the bedridden elderly at home in a rural area of Shiga Prefecture: special reference to morbidity rate and blood pressure, electrocardiograph and blood examination data. *[Nihon koshu eisei zasshi] Japanese journal of public health.* 1993;40(9):850-858.
161. Ohnishi H, Saitoh S, Shimamoto K. The Tanno and Sobetsu Study. *Nihon rinsho. Japanese journal of clinical medicine.* 2010;68(5):839-842.
162. Marugame T, Sobue T, Satoh H, et al. Lung cancer death rates by smoking status: Comparison of the Three-Prefecture Cohort study in Japan to the Cancer Prevention Study II in the USA. *Cancer science.* 2005;96(2):120-126.
163. Nakamura K, Sakurai M, Miura K, et al. Homeostasis model assessment of insulin resistance and the risk of cardiovascular events in middle-aged non-diabetic Japanese men. *Diabetologia.* 2010;53(9):1894-1902.
164. Hankin JH, Stram DO, Arakawa K, et al. Singapore Chinese Health Study: development, validation, and calibration of the quantitative food frequency questionnaire. *Nutrition and cancer.* 2001;39(2):187-195.
165. Khoo CM, Sairazi S, Taslim S, et al. Ethnicity modifies the relationships of insulin resistance, inflammation, and adiponectin with obesity in a multiethnic Asian population. *Diabetes care.* 2011;34(5):1120-1126.
166. Tan CE, Emmanuel SC, Tan B-Y, Jacob E. Prevalence of diabetes and ethnic differences in cardiovascular risk factors. The 1992 Singapore National Health Survey. *Diabetes care.* 1999;22(2):241-247.
167. Jee SH, Ohrr H, Sull JW, Yun JE, Ji M, Samet JM. Fasting serum glucose level and cancer risk in Korean men and women. *Jama.* 2005;293(2):194-202.
168. Jee SH, O'Donnell MP, Suh I, Kim IS. The relationship between modifiable health risks and future medical care expenditures: the Korea Medical Insurance Corporation (KMIC) Study. *American Journal of Health Promotion.* 2001;15(4):244-255.
169. Lee E-H, Park SK, Ko K-P, et al. Cigarette smoking and mortality in the Korean Multi-center Cancer Cohort (KMCC) Study. *Journal of Preventive Medicine and Public Health.* 2010;43(2):151-158.
170. Bae J-M, Li Z-M, Shin M-H, Kim D-H, Lee M-S, Ahn Y-O. Pulmonary tuberculosis and lung cancer risk in current smokers: The Seoul Male Cancer Cohort Study. *Journal of Korean medical science.* 2013;28(6):896-900.
171. Chuang S-Y, Bai C-H, Chen W-H, Lien L-M, Pan W-H. Fibrinogen independently predicts the development of ischemic stroke in a Taiwanese population CVDFACTS Study. *Stroke.* 2009;40(5):1578-1584.
172. Wu M-M, Chen H-C, Chen C-L, et al. A prospective study of gynecological cancer risk in relation to adiposity factors: cumulative incidence and association with plasma adipokine levels. *PloS one.* 2014;12(9).
173. Liu H-C, Wang S-J, Fuh J-L, et al. The Kinmen Neurological Disorders Survey (KINDS): A study of a chinese population. *Neuroepidemiology.* 1997;16(2):60-68.
174. Vathesatogkit P, Woodward M, Tanomsup S, et al. Cohort Profile: The electricity generating authority of Thailand study. *International journal of epidemiology.* 2012;41(2):359-365.
175. Argos M, Kalra T, Rathouz PJ, et al. Arsenic exposure from drinking water, and all-cause and chronic-disease mortalities in Bangladesh (HEALS): a prospective cohort study. *The Lancet.* 2010;376(9737):252-258.
176. Pednekar MS, Hakama M, Hebert JR, Gupta PC. Association of body mass index with all-cause and cause-specific mortality: findings from a prospective cohort study in Mumbai (Bombay), India. *International journal of epidemiology.* 2008;37(3):524-535.
177. Sankaranarayanan R, Ramadas K, Thomas G, et al. Effect of screening on oral cancer mortality in Kerala, India: a cluster-randomised controlled trial. *The Lancet.* 2005;365(9475):1927-1933.

Figure 1: Association of BMI with all-cause mortality, by geographical region



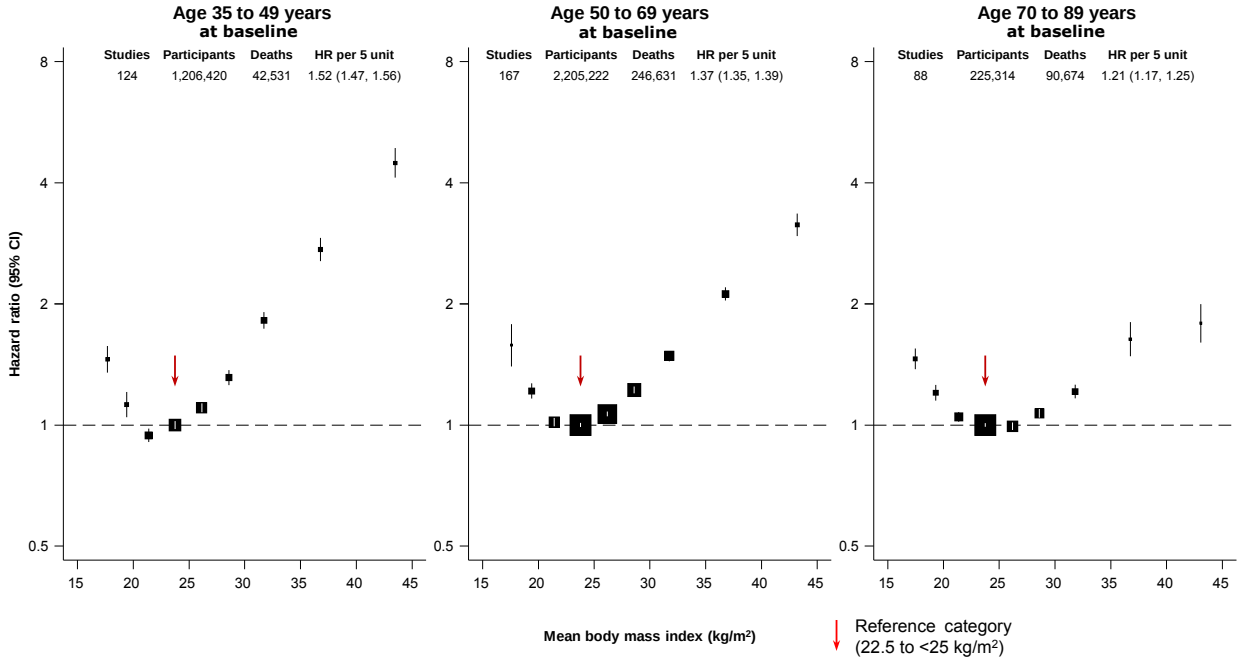
HR, hazard ratio per 5 kg/m^2 of BMI in the range BMI >25 kg/m^2 (and its 95% CI).

Analyses are restricted to never-smokers without pre-existing chronic disease, exclude first 5 years of follow-up, and include data from all geographical regions.

BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2. Reference category (arrow) is 22.5 to <25 kg/m^2.

CIs are from floating variance estimates (reflecting independent variability within each category, including the reference category). Areas of squares are proportional to the information content.

Figure 2: Association of BMI with all-cause mortality, by baseline age group



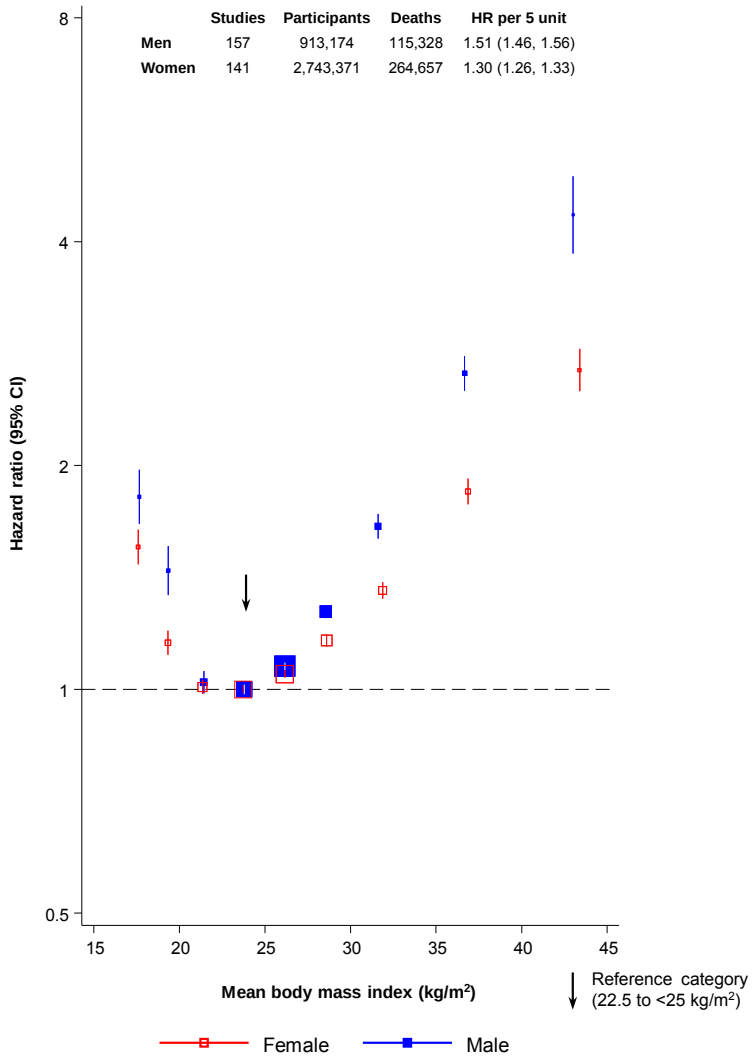
HR, hazard ratio per 5 kg/m^2 of BMI in the range BMI >25 kg/m^2 (and its 95% CI).

Analyses are restricted to never-smokers without pre-existing chronic disease, exclude first 5 years of follow-up, and include data from all geographical regions.

BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2. Reference category (arrow) is 22.5 to <25 kg/m^2.

CIs are from floating variance estimates (reflecting independent variability within each category, including the reference category). Areas of squares are proportional to the information content.

Figure 3: Association of BMI with all-cause mortality, by sex



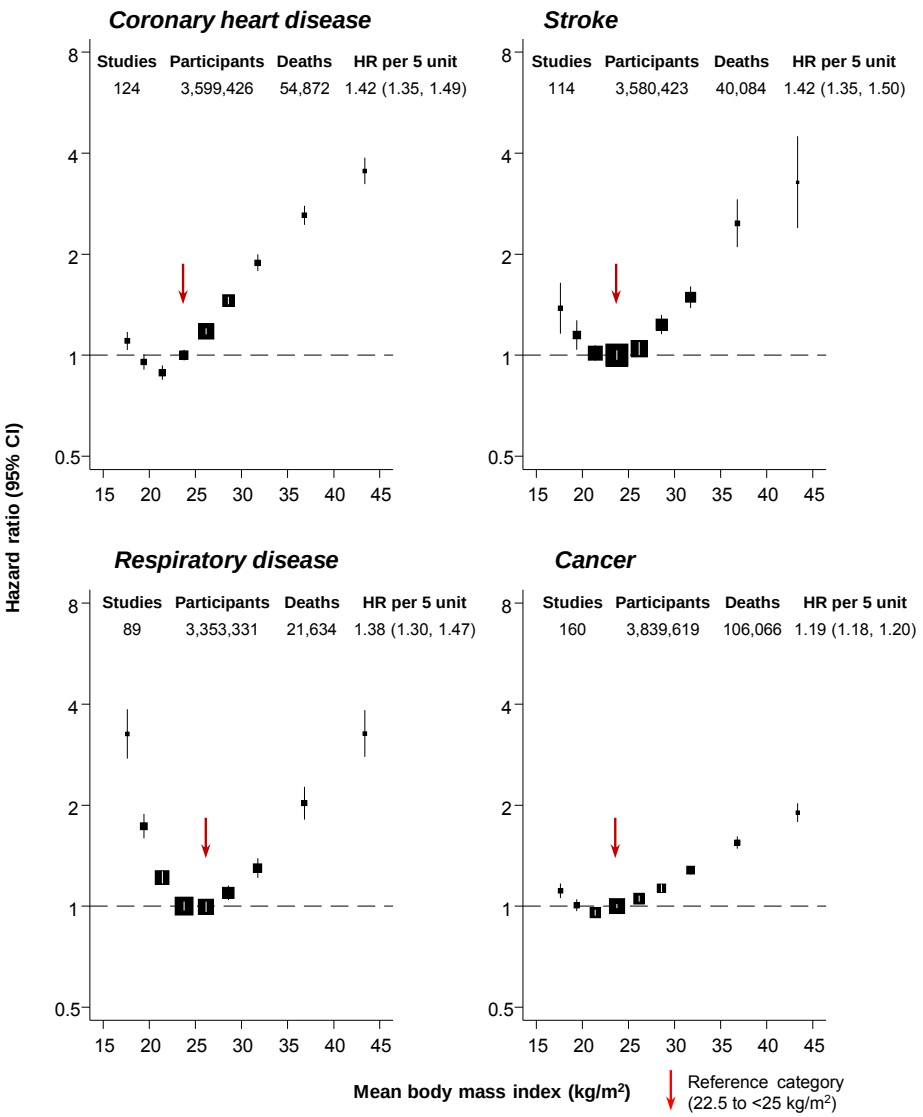
HR, hazard ratio per 5 kg/m^2 of BMI in the range BMI >25 kg/m^2 (and its 95% CI).

Analyses are restricted to never-smokers without pre-existing chronic disease, exclude first 5 years of follow-up, and include data from all geographical regions.

BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2. Reference category (arrow) is 22.5 to <25 kg/m^2.

CIs are from floating variance estimates (reflecting independent variability within each category, including the reference category). Areas of squares are proportional to the information content.

Figure 4: Association of BMI with mortality, by major underlying cause



HR, hazard ratio per 5 kg/m^2 of BMI in the range BMI >25 kg/m^2 (and its 95% CI).

Analyses are restricted to never-smokers without pre-existing chronic disease, exclude first 5 years of follow-up, and include data from all geographical regions.

BMI groups: 15 to <18.5, 18.5 to <20, 20 to <22.5, 22.5 to <25, 25 to <27.5, 27.5 to <30, 30 to <35, 35 to <40, and 40 to <60 kg/m^2. Reference category (arrow) is 22.5 to <25 kg/m^2.

CIs are from floating variance estimates (reflecting independent variability within each category, including the reference category). Areas of squares are proportional to the information content.