Central fatness and the risk of all-cause mortality: systematic review and dose-response meta-analysis of 72 prospective cohort studies

Appendix 1: Tables S1-S5, and Figures S1-S14

Table S1. Search strategy to find potential relevant articles for inclusion in meta-analysis of central fatness and the risk of all-cause mortality.

PubMed
1. obesity [All fields] OR adiposity [All fields] OR fatness [All fields] OR overweight [All fields] OR "waist circumference" [All fields] OR "hip circumference" [All fields] OR "thigh circumference" [All fields]
2. "waist-to-hip ratio" [All fields] OR "waist-to-height ratio" [All fields] OR "waist-to-thigh ratio" [All fields] OR "body adiposity index" [All fields] OR "A body shape index" [All fields]
3. WC [All fields] OR WHR [All fields] OR WHtR [All fields] OR WTR [All fields] BAI [All fields] OR ABSI [All fields]
4. prospective [All fields] OR prospectively [All fields] OR retrospective [All fields] observation [All fields] OR observational [All fields] OR cohort [All fields]
5. follow-up [All fields] OR nested [All fields] OR "relative risk" [All fields] OR "hazard ratio" [All fields] OR "odds ratio" [All fields] OR cohorts [All fields]
6. mortality [Title/Abstract]OR death [Title/Abstract] OR deaths [Title/Abstract] OR survival [Title/Abstract]
7. maternal [Title] OR pregnancy [Title] OR pregnant [Title] OR mothers [Title] OR children [Title]
8. 1 AND 2 AND 3
9. 4 AND 5
10. 6 AND 8 AND 9
11. 10 AND NOT 7
Scopus
1. obesity [All fields] OR adiposity [All fields] OR fatness [All fields] OR overweight [All fields] OR "waist circumference" [All fields] OR "hip circumference" [All fields] OR "thigh circumference" [All fields]
2. "waist-to-hip ratio" [All fields] OR "waist-to-height ratio" [All fields] OR "waist-to-thigh ratio" [All fields] OR "body adiposity index" [All fields] OR "A body shape index" [All fields]
3. WC [All fields] OR WHR [All fields] OR WHtR [All fields] OR WTR [All fields] BAI [All fields] OR ABSI [All fields]
4. prospective [Title/abstract/keyword] OR prospectively [Title/abstract/keyword] OR retrospective [Title/abstract/keyword] observation [Title/abstract/keyword] OR observational [Title/abstract/keyword] OR cohort [[Title/abstract/keyword] OR cohorts [Title/abstract/keyword]
5. follow-up [Title/abstract/keyword] OR nested [Title/abstract/keyword] OR "relative risk" [Title/abstract/keyword] OR "hazard ratio" [Title/abstract/keyword] OR "odds ratio" [Title/abstract/keyword] OR case-cohort [Title/abstract/keyword] OR case-referent [Title/abstract/keyword] OR duration [Title/abstract/keyword]
6. mortality [Title/abstract/keyword] OR death [Title/abstract/keyword] OR deaths [Title/abstract/keyword] OR survival [Title/abstract/keyword]
7. maternal [Title] OR pregnancy [Title] OR pregnant [Title] OR mothers [Title] OR children [Title]
8. 1 AND 2 AND 3
9. 4 AND 5
10. 6 AND 8 AND 9
11. 10 AND NOT 7

Table S2. General characteristics of the studies included in meta-analysis of central fatness and the risk of all-cause mortality.

Author, year (ref No.)	Country	Study name	Follow-up duration (years)	Gender	Participants (n)	Age range (mean), years	Cases (n)	Exposures (assessment)
Andersen[35], 2015	China	the Shanghai Men's Health Study	7.5	M	53,425	40-74	2058	WHR (measured)
Andersen[35], 2015	China	the Shanghai Women's Health Study	13.2	W	63,017	40-70	3167	WHR (measured)
Taylor[36], 2010	UK	the British Women's Heart and Health Study	NA	W	3778	60-79	486	WHR, WC, WHtR, HC (measured)
Taylor[36], 2010	UK	phase 3 of the Caerphilly Prospective Study	NA	M	1920	45-59	855	WHR, WC, WHtR, HC (measured)
Adegbija[37], 2016	Australia	Australia's Northern Territory screening programme	18	W/M	934	18-76	216	WC (measured)
Baik[38], 2000	US	The Health Professionals Follow-up Study	10	M	39,756	40-75	1972	WC, WHR, HC (self-report)
Beleigoli[39], 2012	Brazil	The Bambuı´ Cohort Study of Ageing	10	W/M	1450	>60	521	WC (measured)
Bellocco[40], 2010	Sweden	the Swedish National March Cohort	10	W/M	40,729	50	1943	WC (self-report)
Berentzen [41], 2010	Denmark	Danish Diet, Cancer and Health study	6.7	W/M	26,625	50-64 (56)	929	WC (measured)
Bigaard[42], 2004	Denmark	Danish prospective study 'Diet, Cancer and Health	6.8	W/M	57,054	50-64	2290	HC (measured)
Boggs [43], 2011	US	the Black Women's Health Study	13	W	51,695	21-69	1773	WC (self-report)
Bombelli[44], 2013	Italy	the PAMELA study	12.5	W/M	2005	51	225	WC (measured)
Bowman [45], 2017	UK	UK Biobank Study	8.3	W/M	130,473	60-69 (64)	2974	WHR (measured)
Calori[46], 2011	Italy	the Cremona study	15	W/M	2074	>40 (57)	495	WC (measured)
Cameron[47], 2009	Australia	the AusDiab study	8	W/M	6072	25-75	316	WC, WHR

								(measured)
Cohen[48], 2012	US	the Southern Community Cohort Study	3.4	W/M	8319	40-79 (53)	178	WC, WHR (measured)
Danon-hersch[49], 2017	Switzerland	The Lc65+ COHORT	8.5	W/M	1293	65-70	130	WC (measured)
Dhana[50], 2015	Netherlands	The Rotterdam Study	22	W/M	6366	>55 (69)	3675	WHtR, ABSI, WC, WHR (measured) (linear analysis)
Dolan[51], 2007	US	Study of Osteoporotic Fractures	8	W	8029	>65	945	WC (measured)
Folsom[52], 2000	US	The Iowa Women's Health Study	11-12	W	31,702	55-69	2476	WC, WHR (self-report)
Grant [53], 2017	Australia	The North West Adelaide Health Study (NWAHS)	7.5	W/M	3311	>18 (50)	427	WC, ABSI (measured)
Guallar-Castillón[54], 2009	Spain	A population-based cohort	6	W/M	3536	>60	659	WC (measured)
He[55], 2016	China	Chengdu cohort study	15	M	780	49	29	ABSI (measured)
Heitmann[56], 2009	Denmark	the Danish MONICA study	12.5	W/M	2816	35-65 (50)	412	TC (measured)
Heitmann[57],2004	Denmark	the Danish MONICA study (men only)	13	M	1514	35-65	270	HC (measured)
Hotchkiss[58], 2013	UK	Scottish Health Survey	10.1	W/M	19,329	18-86	1495	WC, WHR (measured)
Howell[59], 2018	US	The National Health and Nutrition Examination Survey (NHANES) III and 1999-2010	11	W/M	10,329	39	1423	WHtR (measured)
Hu[60], 2018	China	Dongfeng-Tongji cohort	8.5	W/M	26,143	64	2246	WC, WHR (measured)
Jacobs[61], 2010	US	The Cancer Prevention Study-II Nutrition Cohort	9	W/M	104,843	>55 (68)	14,647	WC (self-report)
Janssen[62], 2005	US	Cardiovascular Health Study	9	M	5200	>65	1564	WC (measured)
Kahn[63], 2012	US	The National Health and Nutrition	18.1	W/M	11,437	18-64	1081	WC, WHR,

		Examination Survey (NHANES) III						WHtR, WTR (measured)
Kalmijn[64], 1999	US	The Honolulu Heart Program	4.5	M	3741	71-93	766	WHR (measured)
Katzmarzyk[65], 2013	US	The Pennington Center Longitudinal Study	6.2	W/M	14,343	18-89	264	WC, WHR, WHtR, BAI (measured)
Klingberg[66], 2015	Denmark and Sweden	the Danish MONICA study and the Prospective Population Study of Women in Gothenburg	6	W	2492	48.8	787	WC (measured)
Koster[67], 2008	US	the NIH-AARP Diet and Health Study	9	W/M	245,533	51-72 (63)	24,820	WC (self-report)
Krakauer[68], 2012	US	The National Health and Nutrition Examination Survey (NHANES) 1999-2004	5	W/M	14,105	≥18	828	WC, ABSI (measured)
Krakauer[69], 2014	UK	the British Health and Lifestyle Survey (HALS)	24	W/M	7011	≥18	2203	WC, WHtR, ABSI (measured)
Lahmann[70], 2002	Sweden	The Malmo Diet and Cancer Study	5.7	W/M	27,716	45-73	982	WHR (measured)
Lanfer[71], 2014	Denmark and Sweden	the Danish MONICA study and the Prospective Population Study of Women in Gothenburg	23	W	2867	49	821	HC (measured)
Laukkanen[72], 2007	Finland	Kuopio Ischaemic Heart Disease Risk Factor Study	16	M	1639	52	304	WHR (measured)
Lee [73], 1999	US	Cooper Clinic Study	8	M	21,925	30-83 (44)	428	WC (measured)
Lee [74], 2012	China	Cohort study on osteoporosis and general health in Hong Kong	6	W/M	9078	>65	361	WC, WHR (measured)
Lindqvist[75], 2006	Sweden	Gothenburg Women study	24	W	1462	38-60	265	WHR (measured)
Lissner[76],2001	Sweden	Swedish Female Cohort	24	W	1405	38-60 (47)	257	HC (measured)
Martinez-Gomez [77], 2014	Spain	Cohort of older adults	9.4	W/M	2930	>60	865	WC (measured)

Mason[78], 2008	Canada	Canada Fitness Survey (CFS)	12	W/M	10,638	20-69 (38)	571	WC, HC, WHR, TC, WTR (measured)
MCNeely[79], 2012	US	the Japanese Community Diabetes Study	16.9	W/M	733	34-74	161	WC (measured)
Moliner-Urdiales[80], 2013	US	Aerobics Centre Longitudinal Study	8.3	M	19,756	>20 (47)	353	BAI, WC (measured)
Park [81], 2018	Korea	The Korean National Health Insurance Cohort (NHIS) study	5	W/M	465,629	>18	5469	WC, WHtR, ABSI (measured)
Petursson[82], 2011	Norway	the Norwegian HUNT 2 Study	12	W/M	62,223	20-79	5169	WC, HC, WHR, WHtR (measured)
Pischon[83], 2008	Europe	the European Prospective Investigation into Cancer and Nutrition (EPIC)	9.7	W/M	359,387	>18	14,723	WC, WHR (measured)
Price [84], 2006	UK	Health and social assessment of older persons	5.9	W/M	14,833	>75	6649	WC, WHR (measured)
Pujilestari[85], 2019	Indonesia	Collaboration Study on global AGEing and adult health (SAGE)	3	W/M	10,997	>50	981	WC (measured)
Reis [86], 2009	US	the third National Health and Nutrition Examination Survey	12	W/M	12,228	30-102 (55)	2113	WC, WHR, WTR (measured)
Rost[87], 2018	Germany	the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study	15.4	W/M	13,307	25-74 (49)	2409	WC, WHR, WHtR, BAI (measured)
Saito[88], 2012	Japan	Three Japanese Community-Based Studies	14.7	W/M	8026	>40	1711	WC (measured)
Sardarinia[89], 2016	Iran	Tehran Lipid and Glucose Study	10	W/M	9242	>30	487	WC, WHR, WHtR, ABSI (measured)
Sato[90], 2017	Japan	Japanese Specific Health Checkup program	4	W/M	132,647	40-74	1724	WC, WHtR, ABSI (measured)

Schneider [91], 2010	Germany	Two German cohort studies, the DETECT study and SHIP	5.3	W/M	10,652	55	620	WHtR (measured)
Simpson [92], 2007	Australia	Melbourne Collaborative Cohort Study	11	W/M	41,313	27-75	2822	WC, WHR (measured)
Singh[93], 2018	India and Pakistan	the Cardiometabolic Risk Reduction in South Asia Surveillance Study (CARRS Surveillance Study)	3.2	W/M	16,287	>20 (41)	320	WC (measured)
Srikanthan[94], 2009	US	the MacArthur Successful Aging Study	12	W/M	1189	70-79 (74)	219	WC, WHR (measured)
Staiano[95], 2012	Canada	The Canadian Heart Health Survey Follow-Up Study	13	W/M	8061	18-74	887	WC, WHR (measured)
Thomas[96],2011	France	the IPC Center cohort study	4.7	W/M	84,737	>40 (53)	936	WC (measured)
Thomson[97], 2016	US	the Women's Health Initiative	13.5	W	77,505	63	10,761	WC, HC, WHR, ABSI, BAI (measured)
Tice[98], 2006	US	The Breast and Bone Follow-up Study of the Fracture Intervention Trial (B-FIT)	9	W	17,748	55-80 (68)	1886	WHR (measured)
Visscher[99], 2001	Netherlands	The Rotterdam study	5.4	W/M	6296	55-102	479	WC, WHR (measured) (nonlinear analysis)
Wannamethee[100], 2007	UK	The British Regional Heart Study	6	M	4107	60-79	713	WC, WHR (measured)
Welborn[101], 2007	Australia	National heart foundation risk factor prevalence study	11	W/M	9309	20-69	473	WC, WHR, WHtR (measured)
Wu[102], 2017	US	the National Health and Nutrition Examination Survey III	14.3	W/M	11,958	20-90	1081	TC (measured)
Zhang[103], 2008	US	the Nurses' Health Study	16	W	44,636	30-55	3507	WC, WHR, HC (self-report)
Zhao [104], 2016	Tobago	the Tobago Health study	5.9	M	1652	40-91	112	WC (measured)

ABSI, A body shape index; BAI, body adiposity index; HC, hip circumference; TC, thigh circumference; WC, waist circumference; WHR, waist-to-hip ratio; WHtR, waist-to-height ratio; WTR, waist-ti-thigh ratio

Table S3. Reported risk estimates of all-cause mortality across categories of central obesity measures in primary studies.

Exposure categories	Effect size (95%CI)	Confounders
Adegbija, Australia's Northern Territory screening programme Waist circumference (cm)		
73.0 (median)	1.00	Age, tobacco smoking status, alcohol consumption, and BMI
89.5	1.26 (0.85-1.87)	
115.5	2.03 (1.22-3.39)	
Andersen, the Shanghai Men's Health Study Waist-to-hip ratio		
<0.86	1.00	Age, birth year, education, occupation, regular exercise, dietary intake of saturated fats, fruits and vegetables, alcohol consumption, height, smoking status, and BMI
0.86-0.89	1.10 (0.95-1.27)	
0.90-0.91	1.21 (1.04-1.41)	
0.92-0.94	1.11 (0.96-1.30)	
>0.95	1.42 (1.22-1.65)	
1-SD increase, Never smokers	1.12 (1.02-1.22)	
1-SD increase, Former smokers	1.15 (1.03-1.28)	
1-SD increase, Current smokers	1.11 (1.04-1.19)	
Andersen, the Shanghai Women's Health Study Waist-to-hip ratio		
<0.78	1.00	Age, birth year, education, occupation, regular exercise, dietary intake of saturated fats, fruits and vegetables, alcohol consumption, height, menopausal status, smoking status, and BMI
0.78-0.79	1.10 (0.96-1.27)	
0.80-0.82	1.11 (0.97-1.27)	
0.83-0.85	1.20 (1.05-1.37)	
>0.86	1.48 (1.30-1.69)	
1-SD increase, Never smokers	1.15 (1.11-1.19)	
Baik, The Health Professionals Follow-up Study Waist circumference (cm)		
<87.6	1.00	Age, smoking status, family history of myocardial infarction or colon cancer before age 60 years, profession, marital status, height, alcohol intake, and quintiles of calorie-adjusted intakes of vitamin A, vitamin E, and dietary fiber
87.6-92.0	0.98 (0.80-1.21)	
92.0-96.3	0.89 (0.72-1.12)	
96.5-102.1	1.07 (0.88-1.31)	
>102.4	1.37 (1.12-1.67)	
Baik, The Health Professionals Follow-up Study Hip circumference (cm)		

<96.0	1.00	Age, smoking status, family history of myocardial infarction or colon cancer before age 60 years, profession, marital status, height, alcohol intake, and quintiles of calorie-adjusted intakes of vitamin A, vitamin E, and dietary fiber
96.0-98.8	1.00 (0.82-1.21)	
99.0-101.6	0.96 (0.82-1.12)	
101.8-106.4	0.76 (0.63-0.91)	
>106.7	1.24 (1.06-1.44)	
Baik, The Health Professionals Follow-up Study Waist-to-hip ratio		
<0.90	1.00	Age, smoking status, family history of myocardial infarction or colon cancer before age 60 years, profession, marital status, height, alcohol intake, and quintiles of calorie-adjusted intakes of vitamin A, vitamin E, and dietary fiber
0.90-0.91	0.67 (0.52-0.87)	
0.90-0.94	0.88 (0.72-1.08)	
0.95-0.97	1.05 (0.87-1.27)	
≥0.98	1.15 (0.96-1.38)	
Bellocco, the Swedish National March Cohort Waist circumference (cm), Men		
<94	1.00	Age at enrollment, physical activity, cigarette smoking status, alcohol drinking, use of vitamins and minerals, and educational level
94-102	0.97 (0.80-1.16)	
>102	1.30 (1.07-1.58)	
Bellocco, the Swedish National March Cohort Waist circumference (cm), Women		
<80	1.00	Age at enrollment, physical activity, cigarette smoking status, alcohol drinking, use of vitamins and minerals, educational level in men, contraceptive pill use and hormone therapy replacement in women
80-88	1.32 (1.07-1.63)	
>88	1.35 (1.08-1.67)	
Beleigoli, The Bambuı´ Cohort Study of Ageing Waist circumference (cm)		
WC, 1 cm	1.00 (0.99-1.01)	Age, sex, smoking, Chagas disease, log-transformed creatinine, log-transformed BNP levels, major ECG abnormalities, physical activity within the last 90 days, household income, and education
WC, 1 cm, Non-smokers	1.00 (0.99-1.01)	
WC, 1 cm, excluding deaths during first 5 years	0.99 (0.98-1.01)	
Bigaard, Danish prospective study ‘Diet, Cancer and Health Hip circumference (cm)		
HC, Men, 10% increase (~10 cm)	0.65 (0.58-0.74)	Age, smoking status, waist circumference, and BMI
HC, Women, 10% increase (~10 cm)	0.75 (0.62-0.86)	
Bombelli, the PAMELA study Waist circumference		

WC, 1 cm	1.01 (1.00-1.02)	Age, gender, previous cardiovascular events, 24 h systolic blood pressure, total serum cholesterol, plasma glucose, cigarette smoking and antihypertensive drug treatment
Boggs, the Black Women's Health Study Waist circumference (cm), education <12 years		
66.0-76.0	1.00	Age, questionnaire cycle, level of education, marital status, vigorous physical activity, alcohol intake, and BMI
76.2-86.0	0.96 (0.55-1.67)	
86.3-96.3	1.10 (0.61-1.99)	
96.5-119.4	1.03 (0.53-2.01)	
Boggs, the Black Women's Health Study Waist circumference (cm), education >12 years		
66.0-76.0	1.00	Age, questionnaire cycle, level of education, marital status, vigorous physical activity, alcohol intake, and BMI
76.2-86.0	1.12 (0.84-1.48)	
86.3-96.3	1.34 (0.97-1.85)	
96.5-119.4	1.33 (0.91-1.94)	
Boggs, the Black Women's Health Study Waist circumference (cm), Never smokers		
55.9-65.8	1.28 (0.84-1.94)	Age, follow-up cycle, education, marital status, vigorous physical activity, alcohol intake, pack-years of smoking (former and current smokers only), and BMI
66.0-70.9	1.00	
71.0-75.9	1.05 (0.74-1.51)	
76.0-81.0	1.12 (0.77-1.62)	
81.2-86.1	1.15 (0.79-1.67)	
86.3-91.2	1.29 (0.88-1.90)	
91.4-96.2	1.41 (0.94-2.13)	
96.5-101.3	1.15 (0.73-1.79)	
101.6-119.4	1.40 (0.90-2.19)	
Bowman, UK Biobank Study Waist-to-hip ratio, normal weight only		
0.825 (median)	1.00	Age, sex, smoking history (never or former smoker), alcohol intake, and educational attainment
0.875	1.28 (1.09-1.49)	
0.925	1.33 (1.08-1.65)	
Calori, the Cremona study Waist circumference (cm)		
WC, 1 cm	1.01 (0.99-1.02)	Age and sex
Cameron, the AusDiab study		

Waist circumference (cm), Men		
<88.2	0.78 (0.46-1.32)	Age, self-reported history of cardiovascular disease (angina, myocardial infarction or stroke),self-reported cancer (excluding skin cancer) and smoking status
88.2-94.2	1.00	
94.3-99.3	0.69 (0.43-1.09)	
99.4-106.2	0.66 (0.42-1.02)	
>106.2	0.80 (0.52-1.24)	
Cameron, the AusDiab study Waist circumference (cm), Women		
<73.7	1.52 (0.82-2.85)	Age, self-reported history of cardiovascular disease (angina, myocardial infarction or stroke),self-reported cancer (excluding skin cancer) and smoking status
73.7-80.3	1.00	
80.4-87.0	1.43 (0.82-2.48)	
87.1-96.2	0.98 (0.60-1.76)	
>96.2	1.51 (0.88-2.56)	
Cameron, the AusDiab study Waist-to-hip ratio, Men		
<0.88	1.17 (0.57-2.23)	Age, self-reported history of cardiovascular disease (angina, myocardial infarction or stroke),self-reported cancer (excluding skin cancer) and smoking status
0.88-0.91	1.00	
0.92-0.95	1.43 (0.81-2.41)	
0.96-0.99	0.95 (0.53-1.70)	
>0.99	1.42 (0.83-2.33)	
Cameron, the AusDiab study Waist-to-hip ratio, Women		
<0.75	1.40 (0.69-2.70)	Age, self-reported history of cardiovascular disease (angina, myocardial infarction or stroke),self-reported cancer (excluding skin cancer) and smoking status
0.75-0.79	1.00	
0.80-0.82	1.43 (0.78-2.53)	
0.83-0.87	1.33 (0.73-2.28)	
>0.87	1.58 (0.89-2.70)	
Cohen, the Southern Community Cohort Study Waist circumference (cm), Blacks		
85.50 (median)	1.00	Age; sex; education; income; cigarette smoking; and alcohol consumption
95.75	0.94 (0.55-1.60)	
107.25	0.69 (0.39-1.22)	
119.50	0.67 (0.37-1.22)	
Cohen, the Southern Community Cohort Study Waist circumference (cm), Whites		

85.50 (median)	1.00	Age; sex; education; income; cigarette smoking; and alcohol consumption
95.75	1.66 (0.79-3.48)	
107.25	1.03 (0.47-2.28)	
119.50	2.09 (1.01-4.35)	
Cohen, the Southern Community Cohort Study Waist-to-hip ratio, Blacks		
0.845 (median)	1.00	Age; sex; education; income; cigarette smoking; and alcohol consumption
0.920	0.89 (0.49-1.64)	
0.945	1.32 (0.76-2.30)	
0.995	0.97 (0.53-1.79)	
Cohen, the Southern Community Cohort Study Waist-to-hip ratio, Whites		
0.845 (median)	1.00	Age; sex; education; income; cigarette smoking; and alcohol consumption
0.890	1.18 (0.56-2.48)	
0.945	1.21 (0.58-2.50)	
0.995	1.29 (0.63-2.63)	
Thomson, the Women's Health Initiative Waist circumference (cm)		
69.5 (median)	1.00	Age, race/ethnicity, education, alcohol, smoking, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
76.1	0.90 (0.84-0.96)	
82.5	0.93 (0.87-0.99)	
90.0	0.95 (0.89-1.02)	
103	1.21 (1.13-1.29)	
Thomson, the Women's Health Initiative Waist circumference (cm), Never smokers		
69.5 (median)	1.00	Age, race/ethnicity, education, alcohol, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
76.1	0.88 (0.79-0.97)	
82.5	0.91 (0.82-1.00)	
90.0	1.03 (0.94-1.14)	
103	1.31 (1.18-1.45)	
Thomson, the Women's Health Initiative Hip circumference (cm)		
92 (median)	1.00	Age, race/ethnicity, education, alcohol, smoking, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes
98	0.92 (0.87-0.99)	
103	0.90 (0.84-0.96)	

109	0.90 (0.85-0.97)	(yes/no), MI, and general health construct
120	1.13 (1.05-1.20)	
Thomson, the Women's Health Initiative Hip circumference (cm), never smokers		
92 (median)	1.00	Age, race/ethnicity, education, alcohol, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
98	1.01 (0.91-1.11)	
103	0.99 (0.90-1.11)	
109	0.98 (0.89-1.08)	
120	1.30 (1.17-1.43)	
Thomson, the Women's Health Initiative Waist-to-hip ratio		
0.72 (median)	1.00	Age, race/ethnicity, education, alcohol, smoking, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
0.76	0.96 (0.89-1.03)	
0.80	1.00 (0.93-1.07)	
0.84	1.04 (0.97-1.12)	
0.90	1.20 (1.13-1.29)	
Thomson, the Women's Health Initiative Waist-to-hip ratio, Never smokers		
0.72 (median)	1.00	Age, race/ethnicity, education, alcohol, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
0.76	0.90 (0.81-1.00)	
0.80	0.96 (0.86-1.06)	
0.84	1.06 (0.96-1.16)	
0.90	1.16 (1.06-1.29)	
Thomson, the Women's Health Initiative A body shape index		
0.068 (median)	1.00	Age, race/ethnicity, education, alcohol, smoking, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
0.071	1.00 (0.93-1.08)	
0.074	1.05 (0.98-1.13)	
0.076	1.10 (1.03-1.18)	
0.081	1.37 (1.28-1.47)	
Thomson, the Women's Health Initiative A body shape index, never smokers		
0.068 (median)	1.00	Age, race/ethnicity, education, alcohol, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI,
0.071	0.98 (0.88-1.09)	
0.074	1.06 (0.95-1.17)	

0.076	1.11 (1.01-1.32)	and general health construct
0.081	1.35 (1.22-1.49)	
Thomson, the Women's Health Initiative Body adiposity index (%)		
26.6 (median)	1.00	Age, race/ethnicity, education, alcohol, smoking, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
29.6	0.91 (0.85-0.97)	
32.1	0.85 (0.80-0.91)	
35.1	0.86 (0.81-0.92)	
40.9	1.06 (0.99-1.13)	
Thomson, the Women's Health Initiative Body adiposity index (%), Never smokers		
26.6 (median)	1.00	Age, race/ethnicity, education, alcohol, energy intake, HEI-2005, moderate-strenuous physical activity, sedentary time, sleep, hormone replacement therapy, diabetes (yes/no), MI, and general health construct
29.6	0.94 (0.85-1.04)	
32.1	0.89 (0.80-0.98)	
35.1	0.90 (0.82-1.00)	
40.9	1.16 (1.05-1.28)	
Dhana, The Rotterdam Study Waist circumference (cm)		
WC, Men, 1-SD increase	1.02 (0.97-1.07)	Age, current smoking, systolic blood pressure, medication for hypertension, diabetes mellitus, total cholesterol and high-density lipoprotein cholesterol
WC, Women, 1-SD increase	1.02 (0.98-1.07)	
Dhana, The Rotterdam Study Waist-to-hip ratio		
WHR, Men, 1-SD increase	1.07 (1.01-1.12)	Age, current smoking, systolic blood pressure, medication for hypertension, diabetes mellitus, total cholesterol and high-density lipoprotein cholesterol
WHR, Women, 1-SD increase	1.02 (0.98-1.07)	
Dhana, The Rotterdam Study Waist-to-height ratio		
WHtR, Men, 1-SD increase	1.03 (0.98-1.08)	Age, current smoking, systolic blood pressure, medication for hypertension, diabetes mellitus, total cholesterol and high-density lipoprotein cholesterol
WHtR, Women, 1-SD increase	1.02 (0.98-1.06)	
Dhana, The Rotterdam Study A body shape index		
ABSI, Men, 1-SD increase	1.15 (1.09-1.21)	Age, current smoking, systolic blood pressure, medication for hypertension, diabetes mellitus, total cholesterol and high-density lipoprotein cholesterol
ABSI, Women, 1-SD increase	1.09 (1.04-1.14)	

Dolan, Study of Osteoporotic Fractures Waist circumference (cm), all participants		
<74.1	1.00	Age, self-reported health, grip strength, nonthiazide diuretic use, and femoral neck bone mineral density
74.1-80.0	0.87 (0.69-1.09)	
80.0-85.7	0.93 (0.75-1.17)	
85.7-93.4	1.10 (0.88-1.36)	
>93.4	1.18 (0.94-1.47)	
Dolan, Study of Osteoporotic Fractures Waist circumference (cm), Never smokers		
<74.1	1.00	Age, self-reported health, grip strength, nonthiazide diuretic use, and femoral neck bone mineral density
74.1-80.0	1.05 (0.78-1.42)	
80.0-85.7	0.88 (0.64-1.22)	
85.7-93.4	1.14 (0.84-1.53)	
>93.4	1.28 (0.94-1.75)	
Danon-hersch, The Lc65+ COHORT Waist circumference (cm)		
74.00 (median)	0.75 (0.43-1.29)	Sex, age at first visit, education, financial difficulties, involuntary weight loss; smoking status; and financial difficulties were considered
87.25	1.00	
95.70	0.69 (0.38-1.22)	
100.50	0.59 (0.32-1.09)	
126.50	1.36 (0.82-2.26)	
Folsom, The Iowa Women's Health Study Waist circumference (cm)		
<74.3	1.00	Age
74.3-80.0	0.99 (0.90-1.10)	
80.0-87.3	0.90 (0.80-1.00)	
87.3-96.0	0.93 (0.80-1.10)	
>96.0	1.30 (1.10-1.50)	
Folsom, The Iowa Women's Health Study Waist-to-hip ratio		
<0.76	1.00	Age
0.76-0.81	1.10 (0.90-1.20)	
0.81-0.85	1.20 (1.10-1.40)	
0.85-0.91	1.30 (1.20-1.50)	
>0.91	1.50 (1.40-1.80)	

Grant, The North West Adelaide Health Study (NWAHS) Waist circumference (cm)		
83.5 (median)	1.00	Age, marital status, work status, annual gross household income, highest educational qualification achieved, country of birth and health-related risk factors (smoking, alcohol risk, physical activity level, high blood pressure, high total blood cholesterol, high triglycerides, high glycated haemoglobin, and parental history of disease-diabetes, heart disease and stroke)
90.5	0.87 (0.66-1.15)	
98.0	1.06 (0.82-1.38)	
Grant, The North West Adelaide Health Study (NWAHS) A body shape index		
ABSI, continuous	1.32 (1.18-1.48)	Age, marital status, work status, annual gross household income, highest educational qualification achieved, country of birth and health-related risk factors (smoking, alcohol risk, physical activity level, high blood pressure, high total blood cholesterol, high triglycerides, high glycated haemoglobin, and parental history of disease-diabetes, heart disease and stroke)
Guallar-Castillón, Spanish population-based cohort Waist circumference (cm)		
85.0 (mean)	1.00	Sex, age, education, smoking (never smoker, ex-smoker, current, alcohol consumption, leisure-time physical activity, chronic obstructive lung disease, cancer in any site, untreated cataracts, depression requiring treatment, dementia, SF-36 mental summary component, and BMI
95.8	1.00 (0.76-1.30)	
102.7	1.28 (0.98-1.66)	
113.9	1.48 (1.07-2.05)	
He, Chengdu cohort study A body shape index		
<0.0712	2.32 (0.59-9.09)	Age, BMI, SBP, DBP, and smoking status
0.0713-0.0735	1.67 (0.40-7.03)	
0.0736-0.0759	4.02 (1.00-15.78)	
0.0760-0.0781	2.49 (0.60-10.30)	
≥0.0782	1.00	
Heitmann, the Danish MONICA study (men only) Hip circumference (cm), Men		
91.3 (mean)	1.00	BMI, waist circumference, smoking status, and physical activity at baseline
96.4	0.88 (0.61-1.27)	
100.4	0.72 (0.47-1.10)	
107.4	0.79 (0.46-1.36)	

Heitmann, the Danish MONICA study (men only) Thigh circumference (cm), Men		
<46.5	2.53 (1.74-3.69)	Smoking, physical activity, education, body height, body fat percentage, waist circumference, and BMI
46.5-48.0	2.11 (1.54-2.89)	
48.0-49.5	1.76 (1.34-2.32)	
49.5-52.0	1.32 (1.07-1.64)	
52.0-55.0	1.00	
55.0-58.0	0.81 (0.66-1.01)	
58.0-61.0	0.70 (0.48-1.03)	
61.0-63.0	0.64 (0.36-1.14)	
>64.0	0.62 (0.31-1.23)	
Heitmann, the Danish MONICA study (men only) Thigh circumference (cm), Women		
<46.0	2.73 (1.38-5.41|)	Smoking, physical activity, education, body height, body fat percentage, waist circumference, and BMI
46.0-48.0	2.35 (1.42-3.90)	
48.0-49.5	2.10 (1.42-3.11)	
49.5-52.0	1.67 (1.28-2.17)	
52.0-55.5	1.00	
55.5-59.5	0.59 (0.42-0.83)	
59.5-63.5	0.53 (0.32-0.86)	
63.5-66.5	0.56 (0.29-1.11)	
>68.5	0.59 (0.25-1.39)	
Hotchkiss, Scottish Health Survey Waist circumference (cm), Men		
<79	1.89 (1.41-2.53)	Age, smoking status, alcohol consumption and year of survey
79-94	1.00	
94-102	0.90 (0.73-1.11)	
≥102	1.10 (0.90-1.33)	
Hotchkiss, Scottish Health Survey Waist circumference (cm), Women		
<79	1.57 (1.13-2.19)	Age, smoking status, alcohol consumption and year of survey
79-94	1.00	
94-102	1.05 (0.83-1.33)	
≥102	1.20 (0.97-1.47)	
Hotchkiss, Scottish Health Survey		

Waist-to-hip ratio, Men		
<0.65	1.04 (0.77-1.39)	Age, smoking status, alcohol consumption and year of survey
0.80-0.90	1.00	
0.90-1.00	0.97 (0.80-1.18)	
≥1.00	1.29 (1.04-1.60)	
Hotchkiss, Scottish Health Survey Waist-to-hip ratio, Women		
<0.65	1.72 (0.99-2.98)	Age, smoking status, alcohol consumption and year of survey
0.80-0.90	1.00	
0.90-1.00	1.41 (1.13-1.76)	
≥1.00	1.56 (1.26-1.94)	
Howell, The National Health and Nutrition Examination Survey (NHANES) III and 1999-2010 Waist-to-height ratio		
WHtR, per 0.05 unit increase, all participants	1.08 (1.03-1.14)	Age, gender and smoking status
WHtR, per 0.05 unit increase, men	1.05 (0.97-1.12)	
WHtR, per 0.05 unit increase, women	1.11 (1.04-1.18)	
Hu, Dongfeng-Tongji cohort Waist circumference (cm)		
73.65 (median)	1.00	Age, sex, drinking status, smoking index, physical activity, family history of cardio-cerebrovascular diseases, and BMI
78.5	1.05 (0.91-1.21)	
85.0	1.09 (0.93-1.27)	
88.5	1.29 (1.10-1.51)	
94	1.58 (1.33-1.89)	
Hu, Dongfeng-Tongji cohort Waist-to-hip ratio		
0.445 (median)	1.00	Age, sex, drinking status, smoking index, physical activity, family history of cardio-cerebrovascular diseases, and BMI
0.485	1.06 (0.92-1.23)	
0.520	1.16 (0.99-1.35)	
0.550	1.41 (1.20-1.66)	
0.590	1.81 (1.51-2.17)	
Jacobs, The Cancer Prevention Study-II Nutrition Cohort Waist circumference (cm), Men,		
<90	1.00	Age, race, educational level, marital status, smoking status, alcohol use, height, physical activity, and BMI
90-95	1.15 (1.06-1.24)	
95-100	1.11 (1.03-1.21)	

100-105	1.32 (1.21-1.44)	
105-110	1.38 (1.25-1.53)	
110-115	1.55 (1.38-1.75)	
115-120	1.80 (1.55-2.09)	
>120	2.02 (1.71-2.39)	
Jacobs, The Cancer Prevention Study-II Nutrition Cohort Waist circumference (cm), Women		
<75	1.00	Age, race, educational level, marital status, smoking status, alcohol use, height, hormone therapy, physical activity, and BMI
75-80	1.24 (1.11-1.38)	
80-85	1.17 (1.05-1.31)	
85-90	1.48 (1.32-1.67)	
90-95	1.47 (1.29-1.67)	
95-100	1.68 (1.46-1.93)	
100-105	1.74 (1.49-2.03)	
105-110	1.98 (1.66-2.36)	
>110	2.36 (1.98-2.82)	
Janssen, Cardiovascular Health Study Waist circumference (cm)		
1-SD increase, all participants	1.12 (1.02-1.22)	Age, sex, race, smoking status, physical activity level, BMI, and socioeconomic status
1-SD increase, Men	1.19 (1.02-1.40)	
1-SD increase, Women	1.07 (0.95-1.20)	
1-SD increase, Without diseases as baseline	1.04 (0.91-1.20)	
Kahn, The National Health and Nutrition Examination Survey (NHANES) III Men		
WC, 1-SD increase (cm)	1.27 (1.06-1.45)	Age, age^2, black ancestry, tobacco exposure, and income ,200% of poverty threshold
WHR, 1-SD increase	1.27 (1.09-1.48)	
WHtR, 1-SD increase	1.33 (1.11-1.59)	
WTR, 1-SD increase	1.43 (1.20-1.71)	
Kahn, The National Health and Nutrition Examination Survey (NHANES) III Women		
WC, 1-SD increase (cm)	1.65 (1.31-2.08)	Age, black ancestry, tobacco exposure, and education, high school graduation
WHR, 1-SD increase	2.33 (1.81-3.00)	
WHtR, 1-SD increase	1.63 (1.24-2.14)	
WTR, 1-SD increase	2.23 (1.69-2.93)	
Kalmijn, The Honolulu Heart Program		

Waist-to-hip ratio		
0.73-0.90	1.00	Age, years of standard education, physical activity index, alcohol consumption, number of cigarettes/d, systolic blood pressure, diastolic blood pressure, serum total cholesterol level, fasting serum glucose and insulin concentrations
0.90-0.93	0.90 (0.70-1.10)	
0.93-0.96	0.80 (0.60-1.00)	
0.96-0.99	0.90 (0.70-1.10)	
0.99-1.27	1.00 (0.80-1.30)	
Kalmijn, The Honolulu Heart Program Waist-to-hip ratio, excluding ever smokers and early deaths		
0.73-0.90	1.00	Age, years of standard education, physical activity index, alcohol consumption, number of cigarettes/d, systolic blood pressure, diastolic blood pressure, serum total cholesterol level, fasting serum glucose and insulin concentrations
0.90-0.93	1.10 (0.70-1.70)	
0.93-0.96	1.00 (0.60-1.60)	
0.96-0.99	1.10 (0.70-1.70)	
0.99-1.27	1.20 (0.70-1.90)	
Katzmarzyk, The Pennington Center Longitudinal Study White Americans, all participants		
WC, 1-SD increase (cm)	1.41 (1.25-1.60)	Age, sex, exam year, study code, smoking, alcohol consumption and exercise as covariates
WHR, 1-SD increase	1.40 (1.23-1.61)	
WHtR, 1-SD increase	1.46 (1.28-1.65)	
BAI, 1-SD increase (%)	1.34 (1.17-1.53)	
Katzmarzyk, The Pennington Center Longitudinal Study White Americans, without CVD or cancer at baseline		
WC, 1-SD increase (cm)	1.38 (1.21-1.58)	Age, sex, exam year, study code, smoking, alcohol consumption and exercise as covariates
WHR, 1-SD increase	1.41 (1.23-1.62)	
WHtR, 1-SD increase	1.44 (1.27-1.64)	
BAI, 1-SD increase (%)	1.33 (1.15-1.52)	
Katzmarzyk, The Pennington Center Longitudinal Study African Americans, all participants		
WC, 1-SD increase (cm)	1.18 (0.97-1.45)	Age, sex, exam year, study code, smoking, alcohol consumption and exercise as covariates
WHR, 1-SD increase	1.06 (0.98-1.16)	
WHtR, 1-SD increase	1.12 (0.92-1.37)	
BAI, 1-SD increase (%)	0.93 (0.74-1.16)	
Katzmarzyk, The Pennington Center Longitudinal Study African Americans, without CVD or cancer at baseline		
WC, 1-SD increase (cm)	1.23 (1.00-1.51)	Age, sex, exam year, study code, smoking, alcohol consumption and exercise as covariates
WHR, 1-SD increase	1.06 (0.98-1.16	

WHtR, 1-SD increase	1.16 (0.94-1.43)	
BAI, 1-SD increase (%)	0.97 (0.77-1.23)	
Klingberg, the Danish MONICA study and the Prospective Population Study of Women in Gothenburg Waist circumference (cm)		
<67.5	1.00	BMI, age, education, leisure-time physical activity, smoking status, menopausal status, and cohort
68.0-72.0	1.01 (0.80-1.30)	
72.5-76.0	1.28 (0.99-1.64)	
76.5-82.0	1.52 (1.14-2.02)	
>82.5	2.30 (1.60-3.30)	
WC, 5 cm increase	1.20 (1.12-1.28)	
Koster, the NIH-AARP Diet and Health Study Waist circumference (cm), Men		
<88.9	1.10 (1.04-1.16)	Age, racial/ethnic group, education, smoking status, physical activity, alcohol consumption, height, and BMI
90.0-94.0	1.00	
94.0-99.1	1.00 (0.95-1.05)	
99.1-106.7	1.01 (0.96-1.07)	
>106.7	1.22 (1.15-1.29)	
Koster, the NIH-AARP Diet and Health Study Waist circumference (cm), Men, With no prevalent disease at baseline		
<88.9	1.15 (1.07-1.23)	Age, racial/ethnic group, education, smoking status, physical activity, alcohol consumption, height, and BMI
90.0-94.0	1.00	
94.0-99.1	1.00 (0.93-1.07)	
99.1-106.7	1.01 (0.94-1.09)	
>106.7	1.13 (1.04-1.23)	
Koster, the NIH-AARP Diet and Health Study Waist circumference (cm), Men, Never smokers		
<88.9	1.00 (0.89-1.12)	Age, racial/ethnic group, education, smoking status, physical activity, alcohol consumption, height, and BMI
90.0-94.0	1.00	
94.0-99.1	0.97 (0.87-1.08)	
99.1-106.7	0.95 (0.85-1.07)	
>106.7	1.02 (0.89-1.17)	
Koster, the NIH-AARP Diet and Health Study Waist circumference (cm), Women		
<73.7	1.07 (0.99-1.17)	Age, racial/ethnic group, education, smoking status, physical activity, alcohol consumption, height, and BMI
73.7-80.0	1.00	

80.0-87.0	0.99 (0.91-1.07)	
87.0-95.9	1.00 (0.92-1.09)	
>95.9	1.28 (1.16-1.41)	
Koster, the NIH-AARP Diet and Health Study Waist circumference (cm), Women, With no prevalent disease at baseline		
<73.7	1.06 (0.95-1.17)	Age, racial/ethnic group, education, smoking status, physical activity, alcohol consumption, height, and BMI
73.7-80.0	1.00	
80.0-87.0	0.98 (0.88-1.08)	
87.0-95.9	1.00 (0.89-1.12)	
>95.9	1.24 (1.08-1.41)	
Koster, the NIH-AARP Diet and Health Study Waist circumference (cm), Women, Never smokers		
<73.7	1.06 (0.91-1.24)	Age, racial/ethnic group, education, smoking status, physical activity, alcohol consumption, height, and BMI
73.7-80.0	1.00	
80.0-87.0	1.01 (0.87-1.16)	
87.0-95.9	0.97 (0.83-1.14)	
>95.9	1.35 (1.13-1.61)	
Krakauer, NHANES 1999-2004 Waist circumference (cm)		
<82	1.51 (1.12-2.03)	Sex, ethnicity, smoking, presence of diabetes, blood pressure, and serum cholesterol
82-90	1.31 (0.92-1.87)	
90-97	1.00	
97-107	1.30 (0.95-1.77)	
>107	1.72 (1.28-2.32)	
1-SD increase	1.05 (0.94-1.17)	
Krakauer, NHANES 1999-2004 A body shape index		
<0.0762	0.97 (0.69-1.37)	Sex, ethnicity, smoking, presence of diabetes, blood pressure, and serum cholesterol
0.076-0.079	0.93 (0.64-1.35)	
0.079-0.082	1.00	
0.082-0.085	1.46 (1.08-1.99)	
>0.085	1.93 (1.39-2.68)	
1-SD increase	1.30 (1.16-1.44)	
Krakauer, the British Health and Lifestyle Survey A body shape index		

<0.0762	0.77 (0.66-0.88)	Age, BMI, WC, WHR, and WHtR
0.076-0.079	0.78 (0.68-0.89)	
0.079-0.082	1.00	
0.082-0.085	0.97 (0.85-1.11)	
>0.085	1.23 (1.09-1.40)	
1-SD increase	1.13 (1.09-1.16)	
Krakauer, the British Health and Lifestyle Survey		
Waist circumference (cm), 1-SD increase	1.09 (1.03-1.14)	Age, BMI, ABSI, and WHtR
Waist-to-height ratio, 1-SD increase	1.11 (1.06-1.16)	
Lahmann, The Malmo Diet and Cancer Study Waist-to-hip ratio, Men		
<0.895	1.00	Age, height, smoking, and leisure physical activity
0.895-0.927	1.13 (0.86-1.48)	
0.927-0.955	1.20 (0.92-1.57)	
0.955-0.990	1.08 (0.82-1.42)	
>0.990	1.58 (1.22-2.05)	
Lahmann, The Malmo Diet and Cancer Study Waist-to-hip ratio, Women		
<0.750	1.00	Age, height, smoking, and leisure physical activity
0.750-0.777	1.24 (0.87-1.79	
0.777-0.802	1.21 (0.84-1.74)	
0.802-0.835	1.44 (1.02-2.03)	
>0.835	1.98 (1.44-2.74)	
Berentzen, Danish Diet, Cancer and Health study Waist circumference (cm), 1993-97		
WC, Per 5 cm increase	1.11 (1.04-1.18)	Age, smoking habits, Mediterranean diet score, energy intake, education, drinking pattern, sports activity, menopausal status (women only), and BMI
WC, Per 5 cm increase, Men	1.10 (0.98-1.23)	
WC, Per 5 cm increase, women	1.06 (0.97-1.18)	
Berentzen, Danish Diet, Cancer and Health study Waist circumference (cm), 1999-02		
WC, Per 5 cm increase	1.11 (1.05-1.17)	Age, smoking habits, Mediterranean diet score, energy intake, education, drinking pattern, sports activity, menopausal status (women only), and BMI
WC, Per 5 cm increase, Men	1.12 (1.04-1.21)	
WC, Per 5 cm increase, women	1.07 (1.02-1.12)	
Lanfer, the DANISH MONICA study and the Prospective Population Study of Women in Gothenburg Hip circumference (cm)		

<92.0	1.00	BMI, waist, age, education, leisure time physical activity, smoking status, menopausal status and cohort
92.5-95.5	0.73 (0.57-0.92)	
96.0-99.5	0.55 (0.43-0.71)	
100.0-104.5	0.58 (0.44-0.76)	
>105.0	0.54 (0.37-0.78)	
Per 5 cm	0.83 (0.75-0.91)	
Laukkanen, Kuopio Ischemic Heart Disease Risk Factor Study Waist-to-hip ratio		
WHR, 1-SD increase (0.06 unit)	1.00 (0.87-1.13)	Age, alcohol consumption, C-reactive protein, HDL, family history of coronary disease, drug use, physical activity, and European Systematic Coronary Risk Evaluation score
Lee, Cooper Clinic Study Waist circumference (cm)		
<87	1.00	Age, examination year, smoking, alcohol intake, and parental history of ischemic heart disease
87-99, Fit	1.05 (0.66-1.67)	
87-99, Unfit	2.05 (1.08-3.87)	
>99, Fit	0.95 (0.54-1.66)	
>99, Unfit	2.40 (1.41-4.07)	
Lindqvist, Gothenburg Women study Waist-to-hip ratio		
WHR, 0.1 unit, younger women	1.60 (0.99-2.58)	Age, BMI, smoking, physical activity, and triglyceride concentration
WHR, 0.1 unit, older women	1.80 (1.30-2.49)	
Lissner, Swedish Female Cohort Hip circumference (cm)		
<94.5	1.00	Age, smoking, waist circumference, and BMI
94.5-98.5	0.69 (0.48-1.00)	
98.5-103.5	0.55 (0.37-0.82)	
>103.5	0.59 (0.35-0.99)	
Martinez-Gomez, Cohort of older adults Waist circumference (cm)		
WC, 1 cm, Men	1.01 (1.00-1.02)	Age, educational attainment, alcohol intake, former drinking, physical activity, smoking status, systolic blood pressure, hypercholesterolemia, CHD, stroke, diabetes mellitus, hip fracture, and cancer at any site
WC, 1 cm, Women	1.02 (1.01-1.03)	
Mason, Canada Fitness Survey		

Waist circumference (cm)		
WC, Men, 1-SD increase	0.99 (0.88-1.11)	Age, smoking status, alcohol consumption, and leisure-time physical activity
WC, Women, 1-SD increase	1.17 (1.04-1.33)	
Mason, Canada Fitness Survey Hip circumference (cm)		
HC, Men, 1-SD increase	0.98 (0.87-1.09)	Age, smoking status, alcohol consumption, and leisure-time physical activity
HC, Women, 1-SD increase	1.07 (0.95-1.21)	
Mason, Canada Fitness Survey Thigh circumference (cm)		
TC, Men, 1-SD increase	0.84 (0.75-0.95)	Age, smoking status, alcohol consumption, and leisure-time physical activity
TC, Women, 1-SD increase	0.95 (0.83-1.08)	
Mason, Canada Fitness Survey Waist-to-hip ratio		
WHR, Men, 1-SD increase	1.04 (0.90-1.19)	Age, smoking status, alcohol consumption, and leisure-time physical activity
WHR, Women, 1-SD increase	1.18 (1.04-1.34)	
Mason, Canada Fitness Survey Waist-to-thigh ratio		
WTR, Men, 1-SD increase	1.14 (1.02-1.28)	Age, smoking status, alcohol consumption, and leisure-time physical activity
WTR, Women, 1-SD increase	1.21 (1.08-1.36)	
MCNeely, the Japanese Community Diabetes Study Waist circumference (cm)		
WC, interquartile range (25^{th} to 75^{th} percentile)	1.22 (0.95-1.62)	Sex and smoking status
Moliner-Urdiales, Aerobics Centre Longitudinal Study Body adiposity index (%)		
21.5% (mean)	1.00	Age, examination year, physical activity, smoking, alcohol intake, abnormal electrocardiogram, hypercholesterolemia, hypertension and diabetes, and parental history of CVD
24.4	0.99 (0.76-1.28)	
28.5	1.12 (0.86-1.46)	
1-SD increase	1.09 (0.97-1.22)	
Moliner-Urdiales, Aerobics Centre Longitudinal Study Waist circumference (cm)		
1-SD increase	1.10 (0.98-1.24)	Age, examination year, physical activity, smoking, alcohol

		intake, abnormal electrocardiogram, hypercholesterolemia, hypertension and diabetes, and parental history of CVD
Park, The Korean National Health Insurance Cohort (NHIS) study Waist circumference (cm)		
<0.64.0	1.00 (0.83-1.21)	Age, sex, systolic blood pressure, fasting glucose, hemoglobin, alanine aminotransferase, gamma-glutamyltransferase, smoking, alcohol consumption, physical activity level, and socioeconomic status
64.0-68.8	0.75 (0.65-0.86)	
68.8-73.9	0.83 (0.75-0.92)	
73.9-78.6	0.90 (0.83-0.98)	
78.6-84.8	1.00	
84.8-88.8	1.06 (0.98-1.16)	
88.8-92.2	1.11 (1.00-1.23)	
92.2-97.4	1.21 (1.07-1.37)	
97.4-103.0	1.38 (1.16-1.65)	
>103.0	1.33 (1.02-1.73)	
Park, The Korean National Health Insurance Cohort (NHIS) study Waist-to-height ratio		
<0.40	0.88 (0.72-1.07)	Age, sex, systolic blood pressure, fasting glucose, hemoglobin, alanine aminotransferase, gamma-glutamyltransferase, smoking, alcohol consumption, physical activity level, and socioeconomic status
0.40-0.43	0.66 (0.57-0.76)	
0.43-0.45	0.85 (0.75-0.95)	
0.45-0.48	0.91 (0.83-0.99)	
0.48-0.51	1.00	
0.51-0.54	1.10 (1.01-1.19)	
0.54-0.56	1.19 (1.07-1.32)	
0.56-0.60	1.30 (1.17-1.45)	
0.60-0.63	1.64 (1.41-1.91)	
>0.63	2.13 (1.78-2.54)	
Park, The Korean National Health Insurance Cohort (NHIS) study A body shape index		
<0.0695	1.33 (1.04-1.71)	Age, sex, systolic blood pressure, fasting glucose, hemoglobin, alanine aminotransferase, gamma-glutamyltransferase, smoking, alcohol consumption, physical activity level, and socioeconomic status
0.0695-0.0723	1.15 (0.96-1.38)	
0.0723-0.0749	1.03 (0.91-1.18)	
0.0749-0.0772	1.01 (0.91-1.13)	
0.0772-0.0804	1.00	
0.0804-0.0826	1.14 (1.04-1.24)	
0.0826-0.0846	1.18 (1.07-1.29)	

0.0846-0.0877	1.34 (1.22-1.46)	
0.0877-0.0913	1.47 (1.32-1.62)	
>0.0913	1.82 (1.63-2.04)	
Petursson, the Norwegian HUNT 2 Study Waist circumference (cm), Men		
<80	1.17 (0.96-1.42)	Age, smoking, and physical activity
80-89	1.00	
90-99	1.01 (0.92-1.11)	
100-109	1.11 (0.99-1.24)	
>110	1.64 (1.41-1.90)	
Per 10 cm increase	1.11 (1.07-1.16)	
Per SD increase	1.10 (1.06-1.14)	
Petursson, the Norwegian HUNT 2 Study Waist circumference (cm), Women		
<70	1.11 (0.92-1.35)	Age, smoking, and physical activity
70-79	1.00	
80-89	1.00 (0.90-1.12)	
90-99	1.11 (0.99-1.23)	
>100	1.48 (1.30-1.70)	
Per 10 cm increase	1.11 (1.07-1.16)	
Per SD increase	1.13 (1.09-1.18)	
Petursson, the Norwegian HUNT 2 Study Hip circumference (cm), Men		
<95	1.18 (1.02-1.36)	Age, smoking, and physical activity
95-99	1.00	
100-104	0.89 (0.80-0.99)	
105-109	0.86 (0.76-0.96)	
>110	1.17 (1.03-1.33)	
Per 10 cm increase	1.01 (0.95-1.07)	
Per SD increase	1.01 (0.97-1.05)	
Petursson, the Norwegian HUNT 2 Study Hip circumference (cm), Women		
<95	1.10 (0.95-1.27)	Age, smoking, and physical activity
95-99	1.00	
100-104	0.86 (0.75-0.98)	

105-109	0.87 (0.76-1.00)	
>110	1.02 (0.90-1.15)	
Per 10 cm increase	1.03 (0.98-1.07)	
Per SD increase	1.03 (0.99-1.07)	
Petursson, the Norwegian HUNT 2 Study Waist-to-hip ratio, Men		
<0.85	1.07 (0.90-1.26)	Age, smoking, and physical activity
0.85-0.87	1.00	
0.88-0.89	1.12 (0.97-1.29)	
0.90-0.93	1.14 (0.99-1.30)	
>0.94	1.38 (1.21-1.56)	
Per 0.1 unit	1.28 (1.20-1.36)	
Per SD	1.15 (1.11-1.19)	
Petursson, the Norwegian HUNT 2 Study Waist-to-hip ratio, Women		
<0.74	1.01 (0.84-1.22)	Age, smoking, and physical activity
0.74-0.77	1.00	
0.78-0.79	1.08 (0.93-1.26)	
0.80-0.83	1.16 (1.00-1.34)	
>0.84	1.48 (1.29-1.69)	
Per 0.1 unit	1.34 (1.25-1.43)	
Per SD	1.19 (1.15-1.24)	
Petursson, the Norwegian HUNT 2 Study Waist-to-height ratio, Men		
<0.47	1.10 (0.93-1.30)	Age, smoking, and physical activity
0.48-0.49	1.00	
0.50-0.51	1.11 (0.96-1.27)	
0.52-0.54	1.07 (0.94-1.23)	
>0.55	1.24 (1.09-1.40)	
Per 0.1 unit	1.24 (1.15-1.33)	
Per SD	1.12 (1.08-1.16)	
Petursson, the Norwegian HUNT 2 Study Waist-to-height ratio, Women		
<0.43	1.29 (1.05-1.59)	Age, smoking, and physical activity
0.43-0.46	1.00	

0.47-0.49	1.19 (1.01-1.40)	
0.50-0.54	1.15 (0.99-1.34)	
>0.55	1.35 (1.16-1.56)	
Per 0.1 unit	1.20 (1.14-1.27)	
Per SD	1.14 (1.10-1.19)	
Pischon, the European Prospective Investigation into Cancer and Nutrition (EPIC) Waist circumference (cm), Men		
<86.0	1.00	Age at recruitment, smoking status, educational level, alcohol consumption, activity, height, and BMI
86.0-91.5	1.15 (1.05-1.26)	
91.5-96.5	1.35 (1.22-1.50)	
96.5-102.7	1.63 (1.46-1.83)	
>102.7	2.05 (1.80-2.33)	
Pischon, the European Prospective Investigation into Cancer and Nutrition (EPIC) Waist circumference (cm), Women		
<70.1	1.00	Age at recruitment, smoking status, educational level, alcohol consumption, activity, height, and BMI
70.1-75.6	1.16 (1.05-1.28)	
75.6-81.0	1.21 (1.09-1.35)	
81.0-89.0	1.46 (1.30-1.64)	
>89.0	1.78 (1.56-2.04)	
Pischon, the European Prospective Investigation into Cancer and Nutrition (EPIC) Waist-to-hip ratio, Men		
<0.89	1.00	Age at recruitment, smoking status, educational level, alcohol consumption, activity, height, and BMI
0.89-0.92	1.15 (1.05-1.26)	
0.92-0.95	1.26 (1.16-1.38)	
0.95-0.99	1.36 (1.24-1.49)	
>0.99	1.68 (1.53-1.84)	
Pischon, the European Prospective Investigation into Cancer and Nutrition (EPIC) Waist-to-hip ratio, Women		
<0.73	1.00	Age at recruitment, smoking status, educational level, alcohol consumption, activity, height, and BMI
0.73-0.77	1.09 (0.99-1.20)	
0.77-0.80	1.12 (1.02-1.22)	
0.80-0.85	1.23 (1.12-1.34)	
>0.85	1.51 (1.37-1.66)	
Price, Health and social assessment of older persons Waist circumference (cm), Men, nonsmokers		

64.0-88.4	1.00	Age, height, serious illness in loved one in past y, depression, cognitive impairment, unexplained recent weight loss_3.2 kg, housing type, UK quintiles of Carstairs area deprivation score, former smoking (in nonsmokers only), and alcohol consumption
88.4-94.2	1.03 (0.90-1.18)	
94.2-99.5	0.98 (0.83-1.15)	
99.5-105.6	0.89 (0.77-1.02)	
105.6-133.7	1.10 (0.95-1.28)	
Price, Health and social assessment of older persons Waist-to-hip ratio, Men, nonsmokers		
0.74-0.89	1.00	Age, height, serious illness in loved one in past y, depression, cognitive impairment, unexplained recent weight loss_3.2 kg, housing type, UK quintiles of Carstairs area deprivation score, former smoking (in nonsmokers only), and alcohol consumption
0.89-0.92	1.14 (0.97-1.34)	
0.92-0.95	1.06 (0.92-1.23)	
0.95-0.99	1.14 (1.01-1.29)	
0.99-1.18	1.21 (1.05-1.41)	
Price, Health and social assessment of older persons Waist circumference (cm), Women, nonsmokers		
59.1-77.0	1.00	Age, height, serious illness in loved one in past y, depression, cognitive impairment, unexplained recent weight loss_3.2 kg, housing type, UK quintiles of Carstairs area deprivation score, former smoking (in nonsmokers only), and alcohol consumption
77.0-83.1	0.91 (0.78-1.05)	
83.1-88.4	0.92 (0.80-1.05)	
88.4-95.6	0.86 (0.74-1.00)	
95.6-126.1	0.98 (0.85-1.14)	
Price, Health and social assessment of older persons Waist-to-hip ratio, Women, nonsmokers		
0.67-0.79	1.00	Age, height, serious illness in loved one in past y, depression, cognitive impairment, unexplained recent weight loss_3.2 kg, housing type, UK quintiles of Carstairs area deprivation score, former smoking (in nonsmokers only), and alcohol consumption
0.79-0.82	1.03 (0.92-1.15)	
0.82-0.85	1.19 (1.05-1.34)	
0.85-0.90	1.12 (1.00-1.26)	
0.90-1.13	1.27 (1.11-1.46)	
Pujilestari, Collaboration Study on global AGEing and adult health (SAGE) Waist circumference (cm), Men, poor		
<64	2.06 (1.28-3.31)	Sex, age group, marital status, education, occupation, residence, self-reported chronic disease and wealth status.
64-70	1.51 (0.94-2.41)	
70-75	1.00	
75-80	1.27 (0.83-1.94)	
80-88	1.06 (0.91-1.22)	
Pujilestari, Collaboration Study on global AGEing and adult health (SAGE) Waist circumference (cm), Men, rich		

<54	1.01 (0.67-1.54)	Sex, age group, marital status, education, occupation, residence, self-reported chronic disease and wealth status.
54-72	1.00 (0.69-1.47)	
72-77	1.00	
77-83	0.92 (0.74-1.16)	
83-93	1.01 (0.92-1.12)	
Pujilestari, Collaboration Study on global AGEing and adult health (SAGE) Waist circumference (cm), women, poor		
<62	1.36 (0.97-1.90)	Sex, age group, marital status, education, occupation, residence, self-reported chronic disease and wealth status.
6962-69	1.39 (1.06-1.82)	
69-75	1.00	
75-81	0.98 (0.93-1.03)	
81-92	0.89 (0.64-1.25)	
Pujilestari, Collaboration Study on global AGEing and adult health (SAGE) Waist circumference (cm), Women, rich		
<63	1.32 (0.86-2.03)	Sex, age group, marital status, education, occupation, residence, self-reported chronic disease and wealth status.
63-72	1.22 (0.89-1.66)	
72-78	1.00	
78-85	0.98 (0.77-1.24)	
85-97	1.24 (0.78-1.98)	
Reis, the third National Health and Nutrition Examination Survey Waist circumference (cm), Men, 30-64 years		
<87.2	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
87.2-94.0	0.93 (0.56-1.54)	
94.0-99.8	0.52 (0.32-0.87)	
100.0-107.2	1.00 (0.57-1.77)	
>107.2	1.22 (0.72-2.09)	
Reis, the third National Health and Nutrition Examination Survey Waist circumference (cm), Men, 65-102 years		
<87.2	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
87.2-94.0	0.79 (0.52-1.21)	
94.0-99.8	0.70 (0.50-0.99)	
100.0-107.2	0.63 (0.47-0.86)	
>107.2	0.61 (0.43-0.87)	
Reis, the third National Health and Nutrition Examination Survey Waist circumference (cm), Women, 30-64 years		

<80.5	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
80.5-88.7	0.98 (0.49-1.95)	
88.7-96.2	1.48 (0.68-3.21)	
96.2-105.2	1.28 (0.63-2.60)	
>105.2	1.53 (0.78-3.01)	
Reis, the third National Health and Nutrition Examination Survey Waist circumference (cm), Women, 65-102 years		
<80.5	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
80.5-88.7	0.65 (0.48-0.89)	
88.7-96.2	0.77 (0.57-1.06)	
96.2-105.2	0.81 (0.61-1.09)	
>105.2	0.63 (0.43-0.93)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-hip ratio, Men, 30-64 years		
<0.921	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
0.921-0.963	1.61 (0.88-2.96)	
0.963-0.997	1.08 (0.56-2.08)	
0.997-1.035	1.26 (0.67-2.39)	
>1.035	1.98 (1.03-3.79)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-hip ratio, Men, 65-102 years		
<0.921	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
0.921-0.963	0.69 (0.46-1.02)	
0.963-0.997	0.64 (0.43-0.95)	
0.997-1.035	0.57 (0.38-0.83)	
>1.035	0.59 (0.40-0.85)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-hip ratio, Women, 30-64 years		
<0.827	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
0.827-0.874	1.20 (0.57-2.52)	
0.874-0.917	1.89 (0.90-4.01)	
0.917-0.965	2.05 (1.01-4.16)	
>.965	2.41 (1.21-4.77)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-hip ratio, Women, 65-102 years		

<0.827	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
0.827-0.874	0.80 (0.49-1.31)	
0.874-0.917	0.86 (0.48-1.51)	
0.917-0.965	0.95 (0.58-1.53)	
>0.965	0.98 (0.61-1.60)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-thigh ratio, Men, 30-64 years		
<1.754	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
1.754-1.874	1.14 (0.59-2.19)	
1.874-1.977	1.72 (0.90-3.27)	
1.977-2.099	2.43 (1.27-4.63)	
>2.099	2.07 (1.00-4.29)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-thigh ratio, Men, 65-102 years		
<1.754	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
1.754-1.874	0.58 (0.36-0.93)	
1.874-1.977	0.54 (0.37-0.79)	
1.977-2.099	0.47 (0.33-0.68)	
>2.099	0.58 (0.42-0.81)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-thigh ratio, Women, 30-64 years		
<1.620	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
1.620-1.754	1.34 (0.66-2.73)	
1.754-1.866	1.33 (0.58-3.04)	
1.866-2.017	1.59 (0.72-3.52)	
>2.017	2.55 (1.25-5.22)	
Reis, the third National Health and Nutrition Examination Survey Waist-to-thigh ratio, Women, 65-102 years		
<1.620	1.00	Age, race/ethnicity, education, smoking status, alcohol use, heart disease, stroke, respiratory disease, and cancer (except nonmelanoma skin cancer)
1.620-1.754	0.85 (0.53-1.34)	
1.754-1.866	0.59 (0.37-0.94)	
1.866-2.017	0.78 (0.49-1.25)	
>2.017	1.07 (0.69-1.66)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Waist circumference (cm), Men		

<89.0	1.15 (0.97-1.37)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
89.0-95.5	1.00	
95.5-102.0	0.99 (0.85-1.15)	
>102.0	1.28 (1.12-1.47)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Waist circumference (cm), Women		
<74.0	0.98 (0.745-1.31)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
74.0-82.0	1.00	
82.0-91.0	1.22 (1.01-1.49)	
>91.0	1.63 (1.35-1.97)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Waist-to-hip ratio, Men		
<0.88	1.04 (0.85-1.26)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
0.88-0.93	1.00	
0.93-0.97	1.12 (0.97-1.30)	
>0.97	1.35 (1.17-1.55)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Waist-to-hip ratio, Women		
<0.76	0.68 (0.50-0.93)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
0.76-0.80	1.00	
0.80-0.85	1.29 (1.05-1.58)	
>0.85	1.63 (1.35-1.97)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Waist-to-height ratio, Men		
<0.51	1.34 (1.10-1.64)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
0.51-0.55	1.00	
0.55-0.59	1.16 (1.00-1.35)	
>0.59	1.46 (1.27-1.69)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Waist-to-height ratio, Women		
<0.45	1.03 (0.76-1.40)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
0.45-0.51	1.00	
0.51-0.57	1.20 (0.98-1.47)	
>0.57	1.61 (1.32-1.95)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study		

Body adiposity index, Men		
<24.76	1.12 (0.93-1.34)	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
24.76-26.92	1.00	
26.92-29.30	1.02 (0.87-1.19)	
>29.30	1.23 (1.06-1.42)	
Rost, the German population based KORA (Cooperative Health Research in the Region of Augsburg) Augsburg cohort study Body adiposity index (%), Women		
<28.22	1.03 (0.76-1.40	Age, survey, education level, alcohol intake, smoking status, physical activity, and time/smoking status interaction
28.22-31.77	1.00	
31.77-36.15	1.20 (0.98-1.47)	
>36.15	1.61 (1.32-1.95)	
Sardarinia, Tehran Lipid and Glucose Study Waist circumference (cm)		
WC, Men, 1-SD increase	0.86 (0.78-1.02)	Age, systolic blood pressure, anti-hypertensive medication use, total and high-density lipoprotein cholesterol, diabetes, smoking and CVD prevalent
WC, Women, 1-SD increase	1.02 (0.87-1.19)	
Sardarinia, Tehran Lipid and Glucose Study Waist-to-hip ratio		
WHR, Men, 1-SD increase	0.99 (0.97-1.00)	Age, systolic blood pressure, anti-hypertensive medication use, total and high-density lipoprotein cholesterol, diabetes, smoking and CVD prevalent
WHR, Women, 1-SD increase	1.02 (1.00-1.04)	
Sardarinia, Tehran Lipid and Glucose Study Waist-to-height ratio		
WHtR, Men, 1-SD increase	0.90 (0.78-1.05)	Age, systolic blood pressure, anti-hypertensive medication use, total and high-density lipoprotein cholesterol, diabetes, smoking and CVD prevalent
WHtR, Women, 1-SD increase	1.66 (0.91-1.24)	
Sardarinia, Tehran Lipid and Glucose Study A body shape index		
ABSI, Men, 1-SD increase	0.94 (0.81-1.09)	Age, systolic blood pressure, anti-hypertensive medication use, total and high-density lipoprotein cholesterol, diabetes, smoking and CVD prevalent
ABSI, Women, 1-SD increase	1.28 (1.10-1.47)	
Sato, Japanese Specific Health Checkup program A body shape index, Men		
0.0759 (mean)	1.00	Age, systolic blood pressure, high-density lipoprotein cholesterol, glycated hemoglobin, estimated glomerular filtration rate, drug use, past history of cardiovascular disease,
0.0793	1.02 (0.82-1.27)	
0.0816	1.30 (1.06-1.60)	

0.0851	1.48 (1.21-1.80)	and current smoking status
1-SD increase	1.30 (1.18-1.43)	
Sato, Japanese Specific Health Checkup program A body shape index, Women		
0.0765 (mean)	1.00	Age, systolic blood pressure, high-density lipoprotein cholesterol, glycated hemoglobin, estimated glomerular filtration rate, drug use, past history of cardiovascular disease, and current smoking status
0.0818	1.13 (0.86-1.49)	
0.0855	1.31 (1.00-1.71)	
0.0904	1.27 (0.97-1.66)	
1-SD increase	1.07 (0.99-1.17)	
Sato, Japanese Specific Health Checkup program Waist circumference (cm)		
WC, Men, 1-SD increase	0.98 (0.90-1.06)	Age, systolic blood pressure, high-density lipoprotein cholesterol, glycated hemoglobin, estimated glomerular filtration rate, drug use, past history of cardiovascular disease, and current smoking status
WC, Women, 1-SD increase	0.96 (0.88-1.05)	
Sato, Japanese Specific Health Checkup program Waist-to-height ratio		
WHtR, Men, 1-SD increase	0.98 (0.90-1.07)	Age, systolic blood pressure, high-density lipoprotein cholesterol, glycated hemoglobin, estimated glomerular filtration rate, drug use, past history of cardiovascular disease, and current smoking status
WHtR, Women, 1-SD increase	0.98 (0.90-1.07)	
Saito, Three Japanese Community-Based Studies Waist circumference (cm), Men		
58.0-75.8	1.00	Age, community, smoking status, and alcohol drinking
76.0-81.0	0.78 (0.65-0.93)	
81.5-85.0	0.73 (0.60-0.88)	
85.5-59.5	0.84 (0.69-1.01)	
90.0-112.0	0.77 (0.64-0.93)	
Saito, Three Japanese Community-Based Studies Waist circumference (cm), Women		
53.0-70.4	1.00	Age, community, smoking status, and alcohol drinking
71.0-76.0	0.79 (0.61-1.02)	
76.5-81.5	0.91 (0.70-1.18)	
82.0-87.5	0.76 (0.59-0.98)	
88.0-120.0	0.84 (0.66-1.07)	

Schneider, Two German cohort studies, the DETECT study and SHIP Waist circumference (cm), Men		
67.5 (mean)	1.00	Age, sex, cohort (if applicable), educational status, professional status, marital status, smoking status, physical activity, kidney failure, cancer, liver disease, and BMI
90	0.95 (0.70-1.44)	
98.3	1.21 (0.83-1.79)	
109.8	1.14 (0.73-1.88)	
Schneider, Two German cohort studies, the DETECT study and SHIP Waist circumference (cm), Women		
72.85 (mean)	1.00	Age, sex, cohort (if applicable), educational status, professional status, marital status, smoking status, physical activity, kidney failure, cancer, liver disease, and BMI
82.20	1.36 (0.77-2.19)	
88.95	1.54 (0.86-2.64)	
98.65	2.90 (1.64-5.28)	
Schneider, Two German cohort studies, the DETECT study and SHIP Waist-to-hip ratio, Men		
0.645 (mean)	1.00	Age, sex, cohort (if applicable), educational status, professional status, marital status, smoking status, physical activity, kidney failure, cancer, liver disease, and BMI
0.875	1.23 (0.86-1.75)	
0.920	1.11 (0.81-1.65)	
0.960	1.17 (0.83-1.73)	
Schneider, Two German cohort studies, the DETECT study and SHIP Waist-to-hip ratio, Women		
0.765 (mean)	1.00	Age, sex, cohort (if applicable), educational status, professional status, marital status, smoking status, physical activity, kidney failure, cancer, liver disease, and BMI
0.84	1.13 (0.64-1.88)	
0.880	1.26 (0.73-2.00)	
0.920	1.58 (0.92-2.52)	
Schneider, Two German cohort studies, the DETECT study and SHIP Waist-to-height ratio, Men		
0.400 (mean)	1.00	Age, sex, cohort (if applicable), educational status, professional status, marital status, smoking status, physical activity, kidney failure, cancer, liver disease, and BMI
0.535	1.16 (0.81-1.73)	
0.585	1.46 (0.93-2.11)	
0.645	1.58 (0.92-2.62)	
Schneider, Two German cohort studies, the DETECT study and SHIP Waist-to-height ratio, Women		
0.420 (mean)	1.00	Age, sex, cohort (if applicable), educational status, professional status, marital status, smoking status, physical activity, kidney failure, cancer, liver disease, and BMI
0.475	0.88 (0.42-1.60)	
0.510	1.32 (0.75-2.30)	

0.570	2.58 (1.44-4.67)	
Lee, Cohort study on osteoporosis and general health in Hong Kong Waist circumference (cm), Men		
77.2 (mean)	1.00	Age, physical activity, smoking status, and history of cancer, diabetes, and heart disease
86.3	0.85 (0.59-1.21)	
88.8	0.58 (0.38-0.88)	
90.5	0.83 (0.57-1.19)	
94.6	0.87 (0.60-1.25)	
Lee, Cohort study on osteoporosis and general health in Hong Kong Waist circumference (cm), Women		
77.2 (mean)	1.00	Age, physical activity, smoking status, and history of cancer, diabetes, and heart disease
86.3	0.55 (0.24-1.23)	
88.8	1.00 (0.51-1.97)	
90.5	1.44 (0.76-2.71)	
94.6	1.31 (0.70-2.44)	
Lee, Cohort study on osteoporosis and general health in Hong Kong Waist-to-hip ratio, Men		
0.87 (mean)	1.00	Age, physical activity, smoking status, and history of cancer, diabetes, and heart disease
0.91	0.68 (0.46-1.00)	
0.93	0.78 (0.53-1.14)	
0.94	0.92 (0.64-1.33)	
0.97	0.86 (0.60-1.23)	
Lee, Cohort study on osteoporosis and general health in Hong Kong Waist-to-hip ratio, Women		
<0.85	1.00	Age, physical activity, smoking status, and history of cancer, diabetes, and heart disease
0.85-0.89	0.76 (0.37-1.55)	
0.90-0.94	0.74 (0.36-1.52)	
0.95-0.99	1.12 (0.60-2.10)	
>1.00	1.18 (0.63-2.21)	
Simpson, Melbourne Collaborative Cohort Study Waist circumference (cm), Men		
<85.5	1.10 (0.90-1.30)	Age at attendance, country of birth, physical activity, alcohol intake, education, smoking status, living alone, and family history of heart attack; and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
85.5-90.8	1.00	
90.8-95.4	1.00 (0.90-1.20)	
95.4-101.0	1.10 (0.90-1.20)	

>101.0	1.30 (1.10-1.50)	
Simpson, Melbourne Collaborative Cohort Study Waist circumference (cm), Men, Never smokers		
<79	0.80 (0.50-1.130)	Age at attendance, country of birth, physical activity, alcohol intake, education, living alone (men only) and family history of heart attack (men only); and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
79-93	1.00	
94-102	1.00 (0.80-1.20)	
>102	1.30 (1.10-1.60)	
Simpson, Melbourne Collaborative Cohort Study Waist circumference (cm), Women		
<70.0	1.40 (1.10-1.70)	Age at attendance, country of birth, physical activity, alcohol intake, education, smoking status, living alone, and family history of heart attack; and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
70.0-75.5	1.00	
75.5-81.5	1.10 (0.90-1.40)	
81.5-89.3	1.10 (0.90-1.30)	
>89.3	1.30 (1.10-1.60)	
Simpson, Melbourne Collaborative Cohort Study Waist circumference (cm), Women, Never smokers		
<68	1.20 (0.90-1.60)	Age at attendance, country of birth, physical activity, alcohol intake, education, living alone (men only) and family history of heart attack (men only); and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
68-80	1.00	
80-880	1.00 (0.80-1.20)	
>88	1.40 (1.10-1.60)	
Simpson, Melbourne Collaborative Cohort Study Waist-to-hip ratio, Men		
<0.88	1.10 (0.90-1.30)	Age at attendance, country of birth, physical activity, alcohol intake, education, smoking status, living alone, and family history of heart attack; and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
0.88-0.91	1.00	
0.91-0.94	1.10 (0.90-1.30)	
0.94-0.97	1.20 (1.00-1.40)	
>0.97	1.30 (1.10-1.50)	
Simpson, Melbourne Collaborative Cohort Study Waist-to-hip ratio, Men, Never smokers		
<0.88	1.20 (0.90-1.60)	Age at attendance, country of birth, physical activity, alcohol intake, education, living alone (men only) and family history of heart attack (men only); and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
0.88-0.90	1.00	
0.91-0.93	1.40 (1.00-1.90)	
0.94-0.96	1.30 (1.00-1.80)	
>0.97	1.50 (1.10-2.10)	
Simpson, Melbourne Collaborative Cohort Study		

Waist-to-hip ratio, Women		
>0.73	1.30 (1.10-1.60)	Age at attendance, country of birth, physical activity, alcohol intake, education, smoking status, living alone, and family history of heart attack; and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
0.73-0.76	1.00	
0.76-0.80	1.30 (1.00-1.50)	
0.80-0.84	1.20 (1.00-1.40)	
>0.84	1.50 (1.20-1.80)	
Simpson, Melbourne Collaborative Cohort Study Waist-to-hip ratio, Women, Never smokers		
<0.73	1.40 (1.00-1.80)	Age at attendance, country of birth, physical activity, alcohol intake, education, living alone (men only) and family history of heart attack (men only); and stratified by "previous history of heart attack, angina, diabetes, stroke, and cancer
0.73-0.75	1.00	
0.76-0.79	1.50 (1.10-1.90)	
0.80-0.83	1.30 (1.00-1.70)	
>0.84	1.70 (1.40-2.20)	
Srikanthan, the MacArthur Successful Aging Study Waist circumference (cm)		
WC, continuous (cm)	1.00 (0.99-1.01)	Age, gender, race, current smoking status, and total pack-years of smoking
Srikanthan, the MacArthur Successful Aging Study Waist-to-hip ratio		
WHR, Per 0.1 unit increase	1.11 (0.97-1.28)	Age, gender, race, current smoking status, and total pack-years of smoking
WHR, Men, Per 0.1 unit increase	0.95 (0.77-1.12)	
WHR, Women, Per 0.1 unit increase	1.28 (1.05-1.12)	
Staiano, The Canadian Heart Health Survey Follow-Up Study		
WC, 1-SD increase (cm)	1.19 (1.11-1.27)	Age, sex, exam year, alcohol consumption status, smoking status and educational level
WHR, 1-SD increase	1.15 (1.07-1.23)	
Singh, the Cardiometabolic Risk Reduction in South Asia Surveillance Study Waist circumference (cm)		
WC, 1 cm	0.99 (0.97-1.01)	Age, sex, number of chronic conditions, educational level, occupation, alcohol consumption, smoking status, family history of hypertension, diabetes, and CVD, and BMI
Taylor, the British Women's Heart and Health Study		
WC, 1-SD increase (cm)	1.09 (0.99-1.19)	Age, socioeconomic class, smoking, and exercise
WHR, 1-SD increase	1.15 (1.05-1.26)	
HC, 1-SD increase (cm)	0.99 (0.90-1.08)	

WHtR, 1-SD increase	1.10 (1.01-1.20)	
Taylor, phase 3 of the Caerphilly Prospective Study		
WC, 1-SD increase (cm)	1.06 (0.99-1.13)	Age, socioeconomic class, smoking, and exercise
WHR, 1-SD increase	1.08 (1.01-1.16)	
HC, 1-SD increase (cm)	1.00 (0.93-1.07)	
WHtR, 1-SD increase	1.07 (1.00-1.15)	
Thomas, the IPC Center cohort study Waist circumference (cm)		
61.5 (median)	1.17 (0.93-1.46)	Age, gender, tobacco and alcohol consumption, and regular physical activity
79	1.00	
84	0.92 (0.74-1.15)	
90	0.94 (0.76-1.18)	
113	1.29 (1.05-1.59)	
Tice, The Breast and Bone Follow-up Study of the Fracture Intervention Trial (B-FIT Waist-to-hip ratio		
<0.85	1.00	Age, history of chronic disease, self-reported health status, smoking status, alcohol drinking, physical activity, BMI, SBP, heart rate, and Grip strength
0.86-0.90	1.00 (0.90-1.20)	
0.91-0.95	1.10 (1.00-1.30)	
0.96-0.99	1.20 (1.00-1.30)	
>0.99	1.30 (1.10-1.50)	
Visscher, the Rotterdam study (2001) Waist circumference (cm), Men, Never smokers		
<86	1.10 (0.50-2.60)	Age
86-90	1.00	
90-95	1.10 (0.50-2.30)	
95-101	1.50 (0.70-3.10)	
>101	1.60 (0.80-3.40)	
Visscher, the Rotterdam study (2001) Waist circumference (cm), Women, Never smokers		
<79	0.80 (0.50-1.30)	Age
79-85	1.00	
85-91	0.90 (0.60-1.30)	
91-97	1.00 (0.70-1.40)	
>97	0.80 (0.60-1.10)	
Visscher, the Rotterdam study (2001)		

Waist-to-hip ratio, Men, Never smokers		
>0.89	1.00 (0.50-2.20)	Age
0.89-0.93	1.00	
0.93-0.96	1.40 (0.70-2.80)	
0.96-1.00	0.90 (0.40-1.80)	
>1.00	1.40 (0.70-2.60)	
Visscher, the Rotterdam study (2001) Waist-to-hip ratio, Women, Never smokers		
<0.80	0.90 (0.60-1.40)	Age
0.80-0.84	1.00	
0.84-0.88	1.10 (0.80-1.70)	
0.88-0.94	1.00 (0.70-1.50)	
>0.94	1.00 (0.70-1.40)	
Wannamethee, The British Regional Heart Study Waist circumference (cm)		
<94	1.00	Age, social class, physical activity, alcohol intake, smoking, and midarm muscle circumference
94-102	1.11 (0.92-1.34)	
103-105	1.32 (1.01-1.73)	
>106	1.54 (1.21-1.95)	
Wannamethee, The British Regional Heart Study Waist-to-hip ratio		
<0.91	1.00	Age, social class, physical activity, alcohol intake, smoking, and midarm muscle circumference
0.910-0.948	1.08 (0.86-1.35)	
0.949-0.985	1.21 (0.97-1.52)	
>0.986	1.30 (1.04-1.63)	
Welborn, National heart foundation risk factor prevalence study Waist circumference (cm)		
WC, 1-SD increase, Men	1.08 (0.96-1.21)	Age
WC, 1-SD increase, Women	1.18 (1.03-1.35)	
Welborn, National heart foundation risk factor prevalence study Waist-to-hip ratio		
WHR, 1-SD increase, Men	1.25 (1.11-1.42)	Age
WHR, 1-SD increase, Women	1.24 (1.07-1.43)	
Welborn, National heart foundation risk factor prevalence study Waist-to-height ratio		

WHtR, 1-SD increase, Men	1.09 (0.96-1.22)	Age
WHtR, 1-SD increase, Women	1.18 (1.08-1.36)	
Wu, the National Health and Nutrition Examination Survey III Thigh circumference (cm)		
TC, Continuous	0.96 (0.95-0.98)	Age, race, sex, and BMI
Zhang, the Nurses' Health Study Waist circumference (cm)		
<71.2	1.00	Age, quintiles of physical activity, alcohol consumption, family history of MI, smoking status, menopausal status and hormone use, and body mass index
73.7-76.0	1.11 (0.99-1.25)	
76.2-81.0	1.17 (1.04-1.32)	
81.2-88.7	1.31 (1.16-1.48)	
>0.89	1.71 (1.47-1.98)	
1-SD increase	1.34 (1.23-1.39)	
Zhang, the Nurses' Health Study Waist circumference (cm), Never smokers		
<71.2	1.00	Age, quintiles of physical activity, alcohol consumption, family history of MI, smoking status, menopausal status and hormone use, and body mass index
73.7-76.0	1.31 (1.05-1.64)	
76.2-81.0	1.44 (1.14-1.81)	
81.2-88.7	1.46 (1.15-1.87)	
>0.89	2.07 (1.57-2.72)	
1-SD increase	1.24 (1.13-1.34)	
Zhang, the Nurses' Health Study Waist-to-hip ratio		
<0.73	1.00	Age, quintiles of physical activity, alcohol consumption, family history of MI, smoking status, menopausal status and hormone use, and body mass index
0.73-0.75	1.09 (0.96-1.23)	
0.76-0.79	1.14 (1.00-1.29)	
0.80-0.83	1.33 (1.18-1.50)	
≥0.84	1.59 (1.41-1.79)	
1-SD increase	1.13 (1.10-1.16)	
Zhang, the Nurses' Health Study Waist-to-hip ratio, Never smokers		
<0.73	1.00	Age, quintiles of physical activity, alcohol consumption, family history of MI, smoking status, menopausal status and hormone use, and body mass index
0.73-0.75	1.23 (0.99-1.53)	
0.76-0.79	1.13 (0.91-1.41)	
0.80-0.83	1.43 (1.16-1.76)	

≥0.84	1.70 (1.37-2.09)	
1-SD increase	1.12 (1.06-1.17)	
Zhang, the Nurses' Health Study Hip circumference (cm), with adjustment for BMI and WC		
<94	1.00	Age, quintiles of physical activity, alcohol consumption, family history of MI, smoking status, menopausal status and hormone use, body mass index, and waist circumference
94-99	0.87 (0.78-0.97)	
99	0.71 (0.62-0.82)	
102-109	0.74 (0.67-0.87)	
>114	0.73 (0.62-0.86)	
Zhao, the Tobago Health study Waist circumference (cm)		
WC, 1-SD increase	1.01 (0.80-1.28)	Age, height, smoking status, alcohol consumption, physical activity, TV viewing time, health status, cancer, T2D, renal disease, stroke, myocardial infarction and hypertension

BMI, body mass index; CVD, cardiovascular disease; DBP, diastolic blood pressure; HEI, healthy eating index; MI, myocardial infarction; SBP, systolic blood pressure; T2D, type 2 diabetes; TV, television; WC, waist circumference; WHtR, waist-to-height ratio; WHR, waist-to-hip ratio.

Table S4. Quality assessment for studies included the meta-analysis of central fatness and the risk of all-cause mortality (Newcastle Ottawa Scale).

Author, Year	Selection				Comparability		Outcome			Score	Quality
	1	2	3	4	1	2	1	2	3		
Adegbija, 2016		*	*	*	*	*	*	*		7	High
Andersen, 2015 (men)	*	*	*	*	*	*	*		*	8	High
Andersen, 2015(women)	*	*	*	*	*	*	*	*	*	9	High
Baik, 2000	*	*		*	*	*	*	*		7	High
Beleigoli, 2012	*	*	*	*	*	*	*	*	*	9	High
Bellocco, 2010	*	*		*	*	*	*	*	*	8	High
Berentzen, 2010	*	*	*	*	*	*	*		*	8	High
Bigaard, 2004	*	*	*	*	*	*	*		*	8	High
Boggs, 2011	*	*		*	*	*	*	*	*	8	High
Bombelli, 2013	*	*	*	*	*		*	*		7	High
Bowman, 2017	*	*	*	*	*	*	*			7	High
Calori, 2011	*	*	*	*	*		*	*		7	High
Cameron, 2009	*	*	*	*	*		*			6	Moderate
Cohen, 2012	*	*	*	*	*	*	*			7	High
Danon-hersch, 2017	*	*	*	*	*		*		*	7	High
Dhana, 2015	*	*	*	*	*		*	*		7	High
Dolan, 2007	*	*	*	*					*	5	Moderate
Folsom, 2000	*	*		*	*		*	*	*	7	High
Grant, 2017	*	*	*	*	*	*	*			7	High
Guallar-Castillón, 2009	*	*	*	*	*	*	*		*	8	High
He, 2016		*	*	*	*	*	*		*	7	High
Heitmann, 2004	*	*	*	*	*	*	*	*	*	9	High
Heitmann, 2009	*	*	*	*	*	*	*	*	*	9	High

Hotchkiss, 2013	*	*	*	*	*	*	*	*		8	High
Howell, 2018	*	*	*	*	*		*	*		7	High
Hu, 2018	*	*	*	*	*	*	*		*	8	High
Jacobs, 2010	*	*		*	*	*	*	*		7	High
Janssen, 2005	*	*	*	*	*	*	*		*	8	High
Kahn, 2012	*	*	*	*	*	*	*	*		8	High
Kalmijn, 1999	*	*	*	*	*	*	*		*	8	High
Katzmarzyk, 2013	*	*	*	*	*	*	*			7	High
Klingberg, 2015	*	*	*	*	*	*	*	*		8	High
Koster, 2008	*	*		*	*	*	*	*	*	8	High
Krakauer, 2012	*	*	*	*	*		*			6	Moderate
Krakauer, 2014	*	*	*	*	*		*	*		7	High
Lahmann, 2002	*	*	*	*	*	*	*		*	8	High
Lanfer, 2014	*	*	*	*	*	*	*	*	*	9	High
Laukkanen, 2007	*	*	*	*	*	*	*	*	*	9	High
Lee, 1999	*	*	*	*	*	*	*			7	High
Lee, 2012	*	*	*	*	*	*	*			7	High
Lindqvist, 2006	*	*	*	*	*	*				6	Moderate
Lissner,2001		*	*	*	*	*	*	*		7	High
Martinez-Gomez, 2014	*	*	*	*	*	*	*	*	*	9	High
Mason, 2008	*	*	*	*	*	*	*	*		8	High
McNeely, 2012		*	*	*	*		*	*		6	Moderate
Moliner-Urdiales, 2003	*	*	*	*	*	*	*			7	High
Park, 2018	*	*	*	*	*	*	*		*	8	High
Petursson, 2011	*	*	*	*	*	*	*	*		8	High
Pischon, 2008	*	*	*	*	*	*	*	*	*	9	High

Price, 2006	*	*	*	*	*	*	*			7	High
Pujilestari, 2019	*	*	*	*	*		*		*	7	High
Reis, 2009	*	*	*	*	*	*	*	*		8	High
Rost, 2018	*	*	*	*	*	*	*	*	*	9	High
Saito, 2012	*	*	*	*	*	*	*	*		8	High
Sardarinia, 2016	*	*	*	*	*		*	*		7	High
Sato, 2017	*	*	*	*	*		*			6	Moderate
Schneider, 2010	*	*	*	*	*	*	*		*	8	High
Simpson, 2007	*	*	*	*	*	*	*	*	*	9	High
Singh, 2018	*	*	*	*	*	*				6	Moderate
Srikanthan, 2009	*	*	*	*	*		*	*		7	High
Staiano, 2012	*	*	*	*	*	*	*	*		8	High
Taylor, 2010	*	*	*	*	*	*	*		*	8	High
Taylor, 2010	*	*	*	*	*	*	*		*	8	High
Thomas, 2011	*	*	*	*	*	*	*		*	8	High
Thomson, 2016	*	*	*	*	*	*	*	*		8	High
Tice, 2006	*	*	*	*	*	*	*	*	*	9	High
Visscher, 2001	*	*	*	*			*			5	Moderate
Wannamethee, 2007	*	*	*	*	*	*	*		*	8	High
Welborn, 2007	*	*	*	*	*		*	*		7	High
Wu, 2017	*	*	*	*	*	*	*	*		8	High
Zhang, 2008	*	*		*	*	*	*	*	*	8	High
Zhao, 2016		*	*	*	*	*	*		*	7	High

Table S5. Subgroup analyses of waist-to-height ratio (0.1-unit) and the risk of all-cause mortality.

		n	HR (95%CI)	I^2 (%), $P_{hetrogeneity}$
All studies		11	1.24 (1.12 to 1.36)	94%, <0.001
Sex				
Men		8	1.13 (1.01 to 1.24)	77%, <0.001
Women		8	1.20 (1.07 to 1.32)	89%, <0.001
Healthy participants				
All		4	1.18 (1.03 to 1.34)	88%, <0.001
Geographic region				
US		2	1.24 (1.09 to 1.39)	59%, 0.12
Europe		4	1.24 (1.06 to 1.42)	96%, <0.001
Asia		5	1.23 (0.97 to 1.50)	94%, <0.001
Follow-up duration				
<10 years		6	1.26 (1.03 to 1.49)	93%, <0.001
>10 years		5	1.21 (1.07 to 1.36)	95%, <0.001
Anthropometric assessment				
Measured		11	1.24 (1.12 to 1.36)	94%, <0.001
Self-reported		-	-	-
Number of cases				
<1000		4	1.19 (1.02 to 1.36)	73%, 0.012
>1000		7	1.27 (1.12 to 1.42)	96%, <0.001
Study quality				
0–3 stars		-	-	-
4–6 stars		1	0.97 (0.88 to 1.07)	-
7–9 stars		10	1.27 (1.14 to 1.40)	95%, <0.001
Adjustment for confounders				
Body mass index	Yes	2	1.42 (1.16 to 1.69)	69%, 0.07
	No	9	1.20 (1.08 to 1.33)	95%, <0.001
Physical activity	Yes	6	1.40 (1.25 to 1.54)	86%, <0.001
	No	5	1.05 (0.97 to 1.14)	72%, 0.006
Smoking status	Yes	10	1.24 (1.11 to 1.37)	95%, <0.001
	No	1	1.21 (1.06 to 1.37)	-
Alcohol drinking	Yes	4	1.48 (1.37 to 1.59)	50%, 0.10
	No	7	1.10 (1.00 to 1.20)	90%, <0.001

Body mass index, physical activity, smoking status, and alcohol drinking	Yes	3	1.46 (1.32 to 1.59)	61%, 0.08
	No	8	1.15 (1.04 to 1.26)	92%, <0.001
Adjustment for intermediates				
Blood pressure	Yes	5	1.15 (0.95 to 1.34)	95%, <0.001
	No	6	1.31 (1.19 to 1.44)	79%, <0.001
Serum cholesterol	Yes	4	1.05 (0.93 to 1.18)	84%, <0.001
	No	7	1.35 (1.22 to 1.47)	85%, <0.001
Type 2 diabetes	Yes	4	1.05 (0.93 to 1.18)	84%, <0.001
	No	7	1.35 (1.22 to 1.47)	85%, <0.001
Blood pressure, serum cholesterol, and type 2 diabetes	Yes	4	1.05 (0.93 to 1.18)	84%, <0.001
	No	7	1.35 (1.22 to 1.47)	85%, <0.001

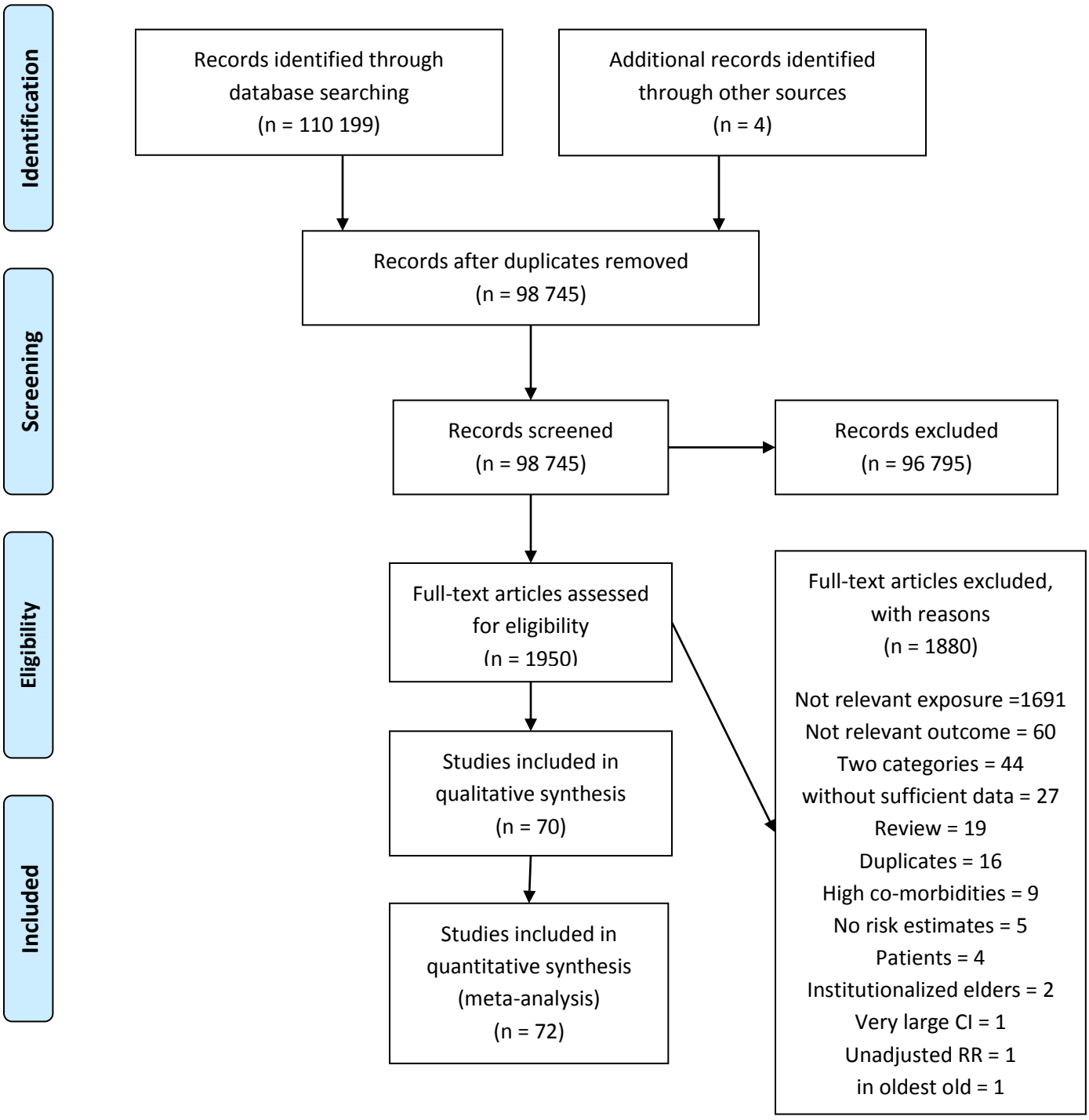

Figure S1. Study selection process for inclusion in the meta-analysis of central fatness and the risk of all-cause mortality.

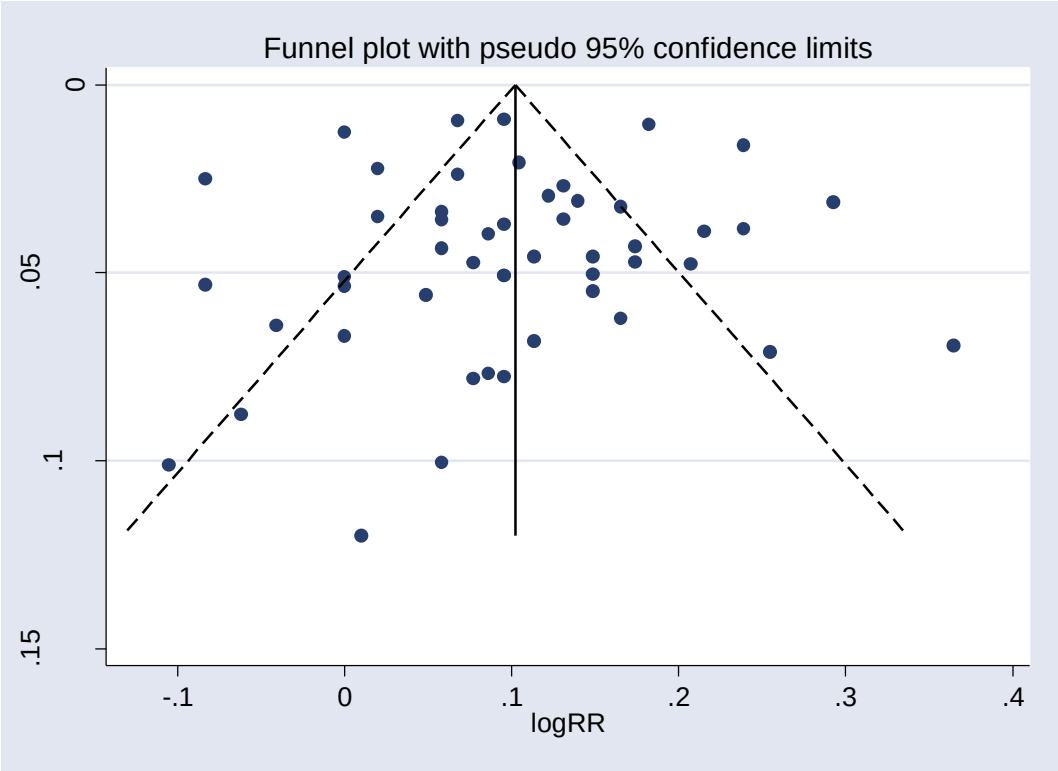

Figure S2. Funnel plot of the relative risks of 50 studies on Waist Circumference (10-cm) and the risk of all-cause mortality. Begg's test *P*=0.58, Egger's test *P*=1.00. Log RR: natural logarithm of relative risk. s.e: standard error.

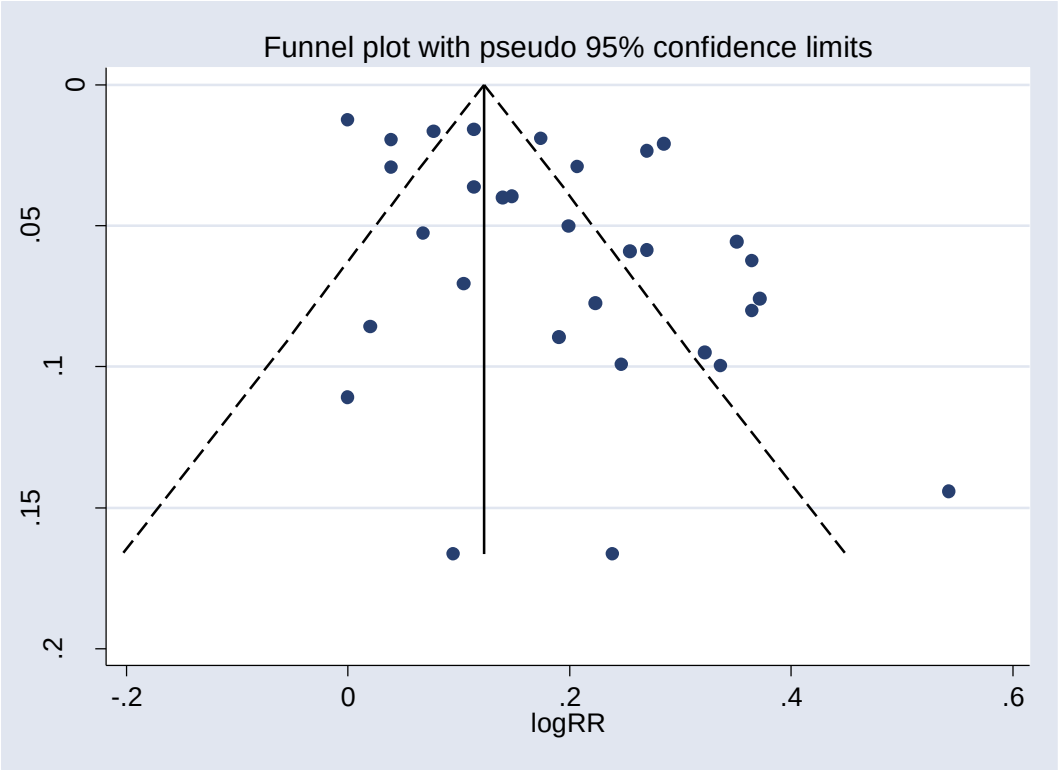

Figure S3. Funnel plot of the relative risks of 31 studies on Waist-to-Hip Ratio (0.1-unit) and the risk of all-cause mortality. Begg's test *P*=0.52, Egger's test *P*=0.19. Log RR: natural logarithm of relative risk. s.e: standard error.

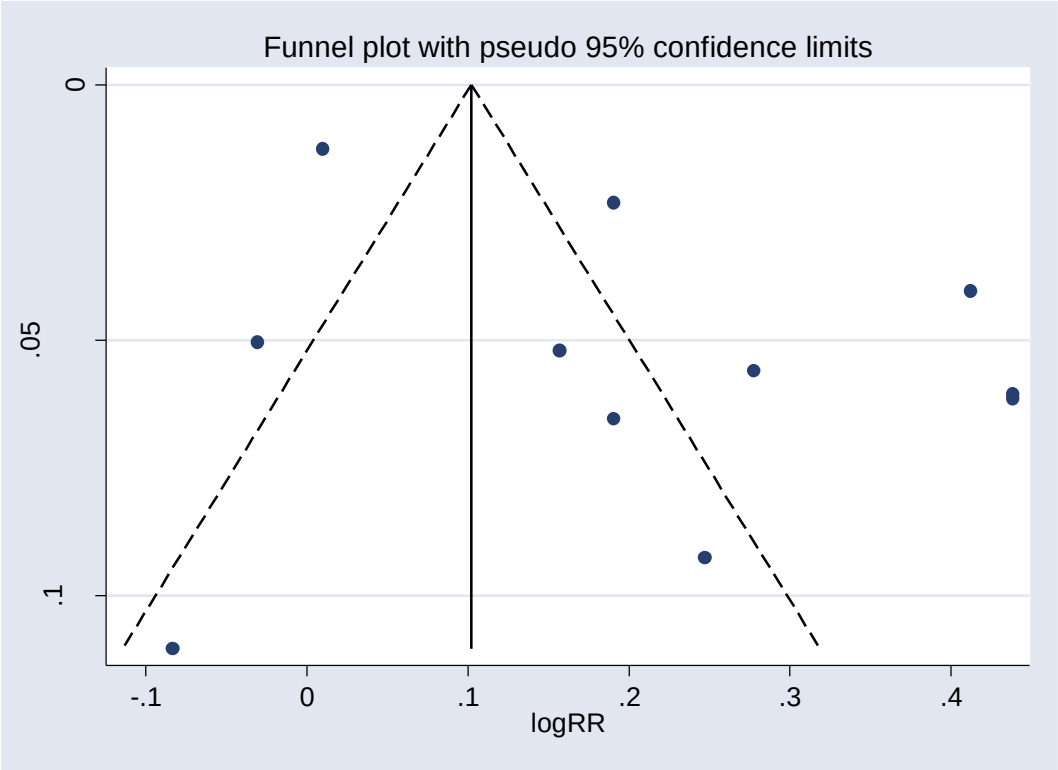

Figure S4. Funnel plot of the relative risks of 11 studies on Waist-to-Height Ratio (0.1-unit) and the risk of all-cause mortality. Begg's test *P*=0.08, Egger's test *P*=0.05. Log RR: natural logarithm of relative risk. s.e: standard error.

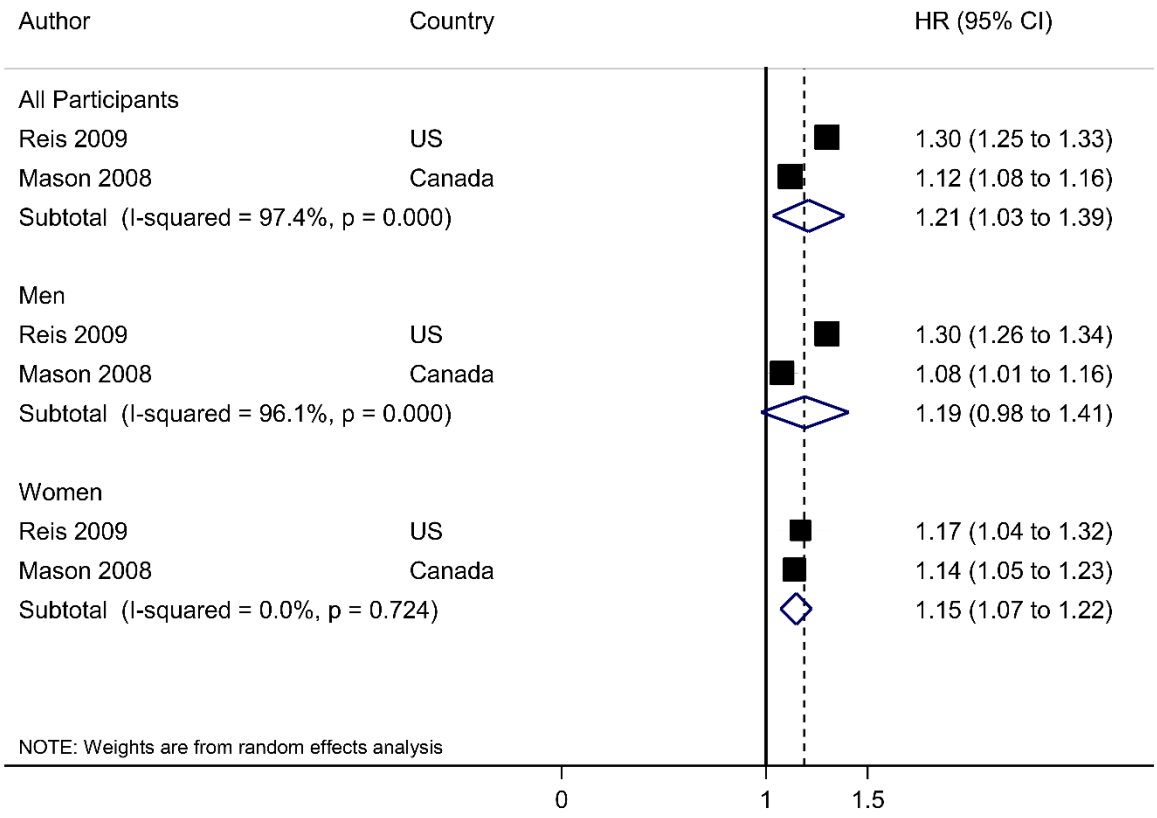

Figure S5. Summary hazard ratio of all-cause mortality for a 0.1 unit increment in Waist-to-Thigh ratio. HR: hazard ratio.

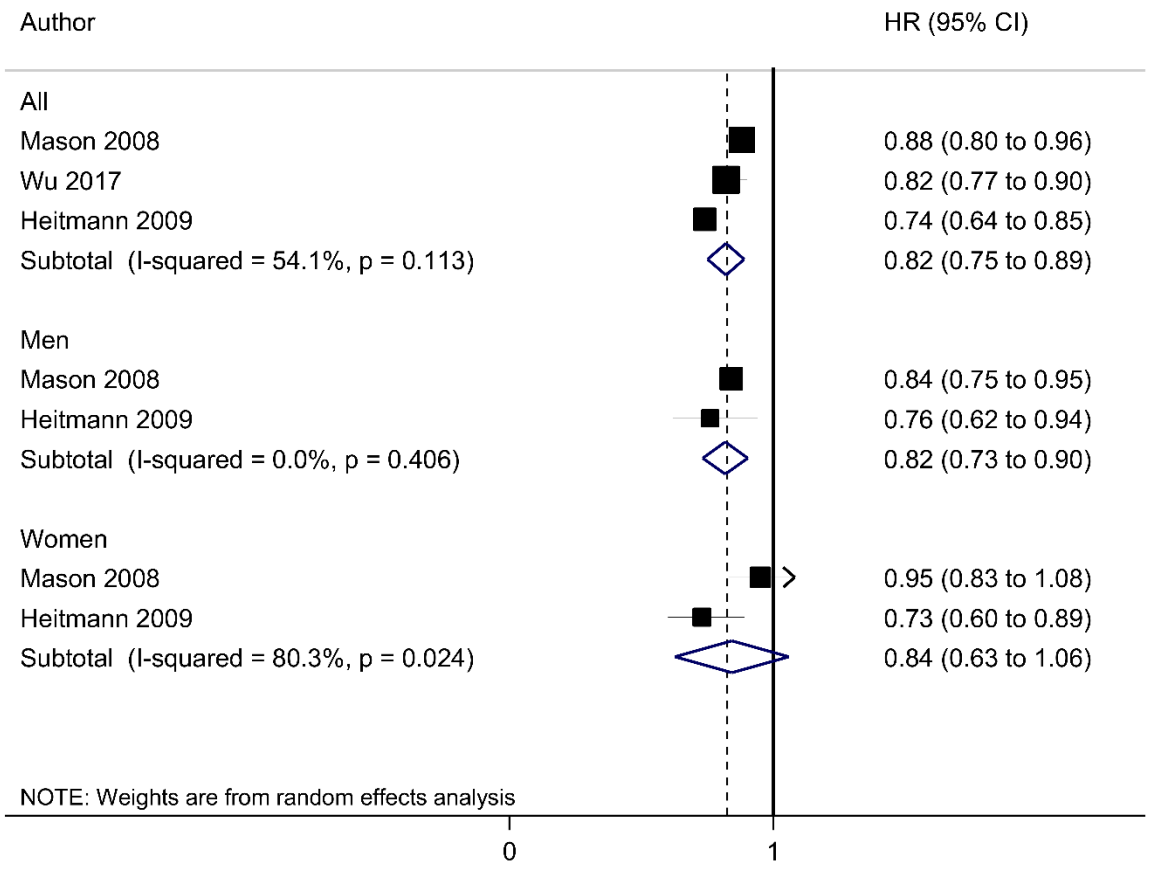

Figure S6. Summary hazard ratio of all-cause mortality for a 5-cm increment in Thigh Circumference. HR: hazard ratio.

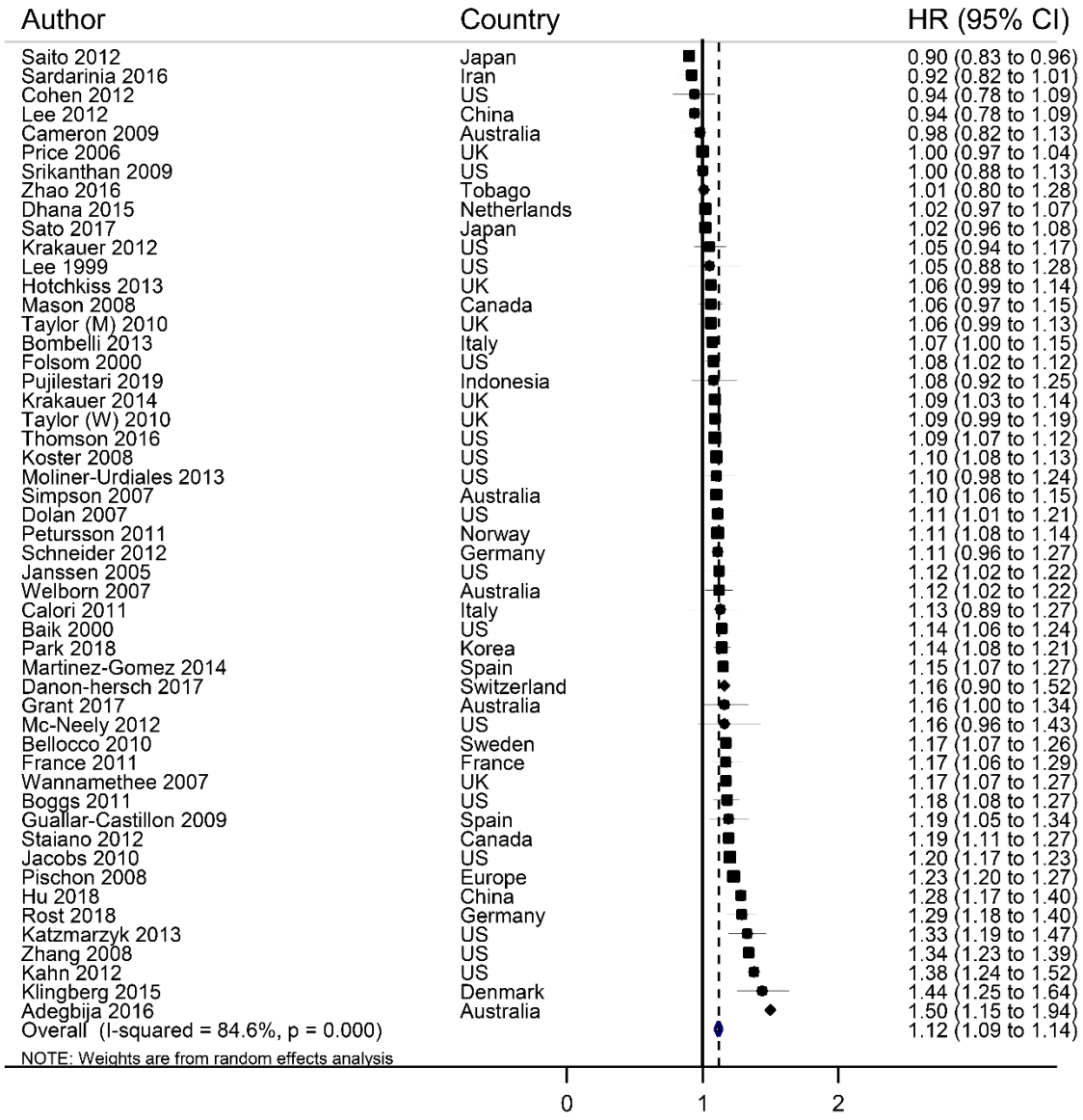

Figure S7. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Waist Circumference. HR: hazard ratio; M, men; W, women.

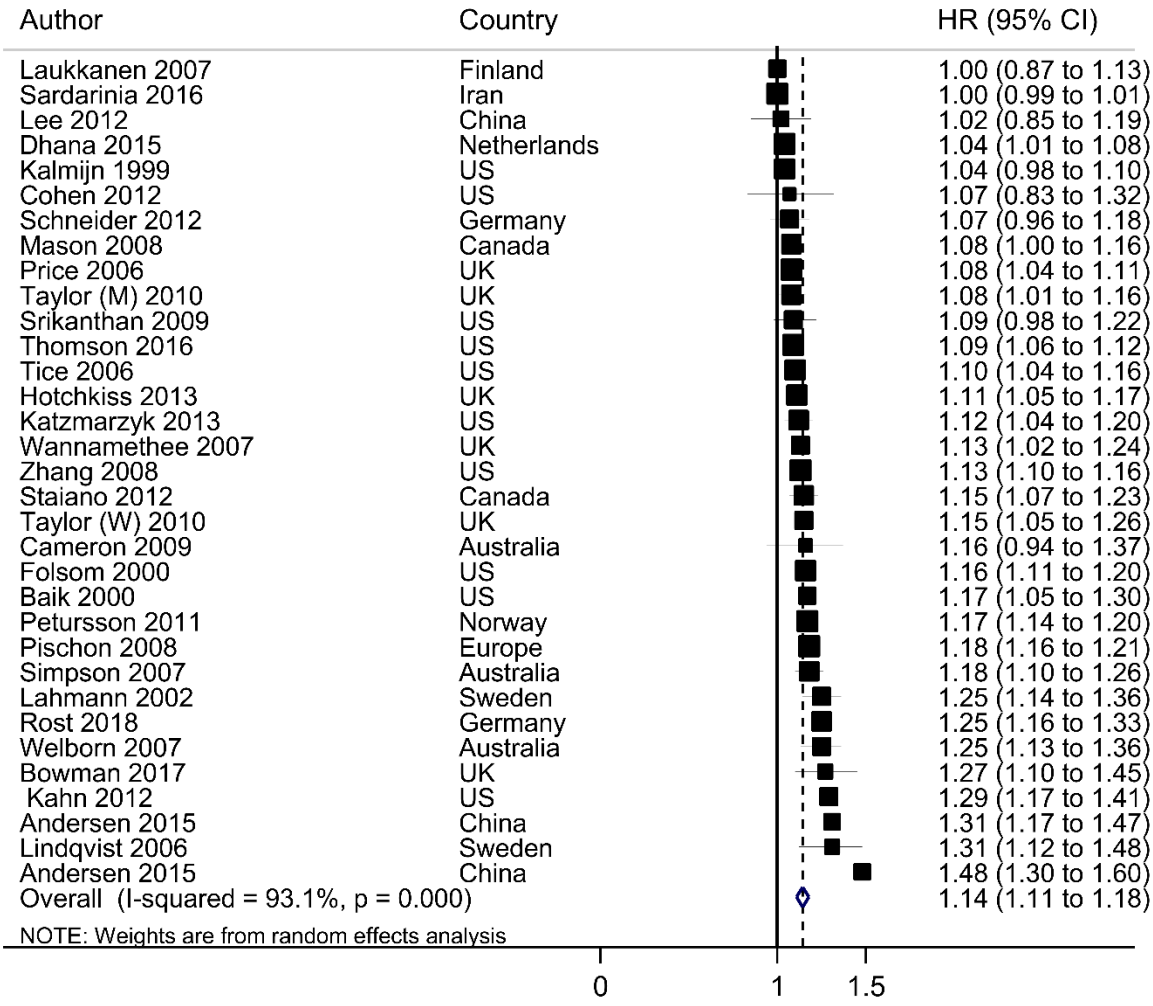

Figure S8. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Waist-to-Hip ratio. HR: hazard ratio; M, men; W, women.

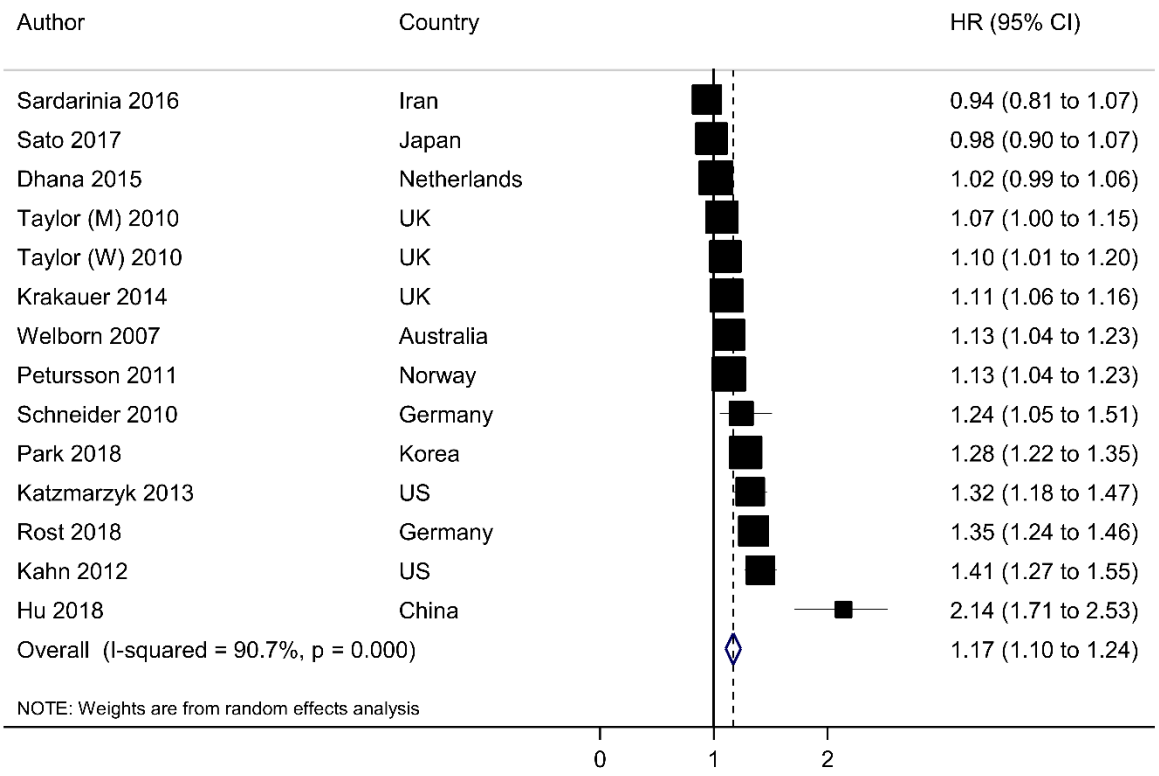

Figure S9. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Waist-to-Height ratio. HR: hazard ratio; M, men; W, women.

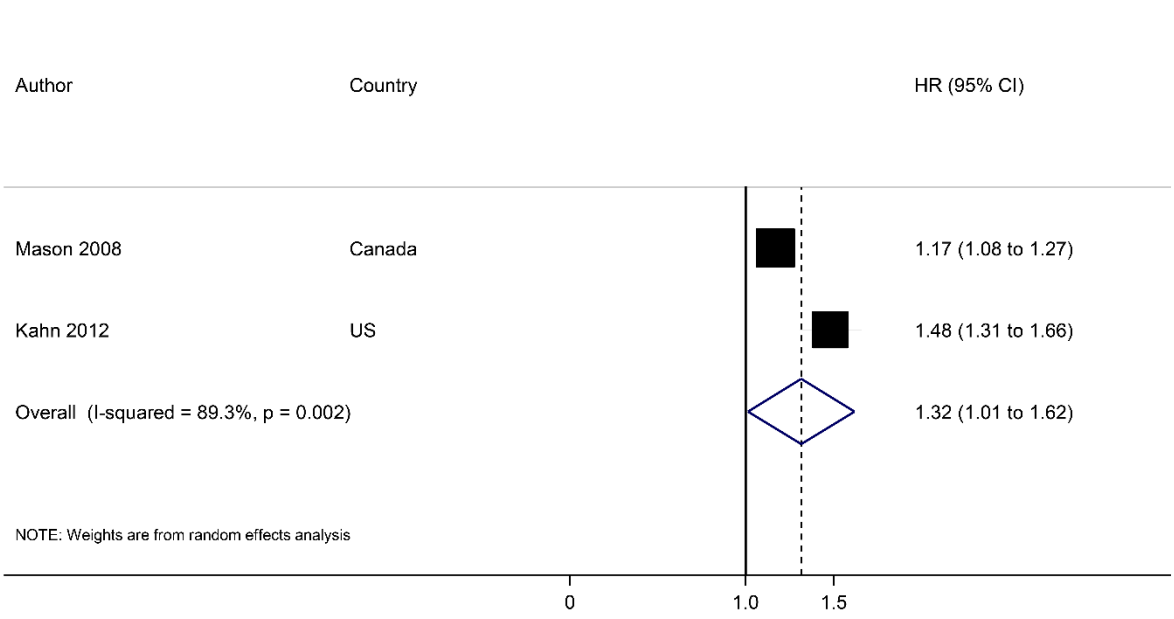

Figure S10. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Waist-to-Thigh ratio. HR: hazard ratio.

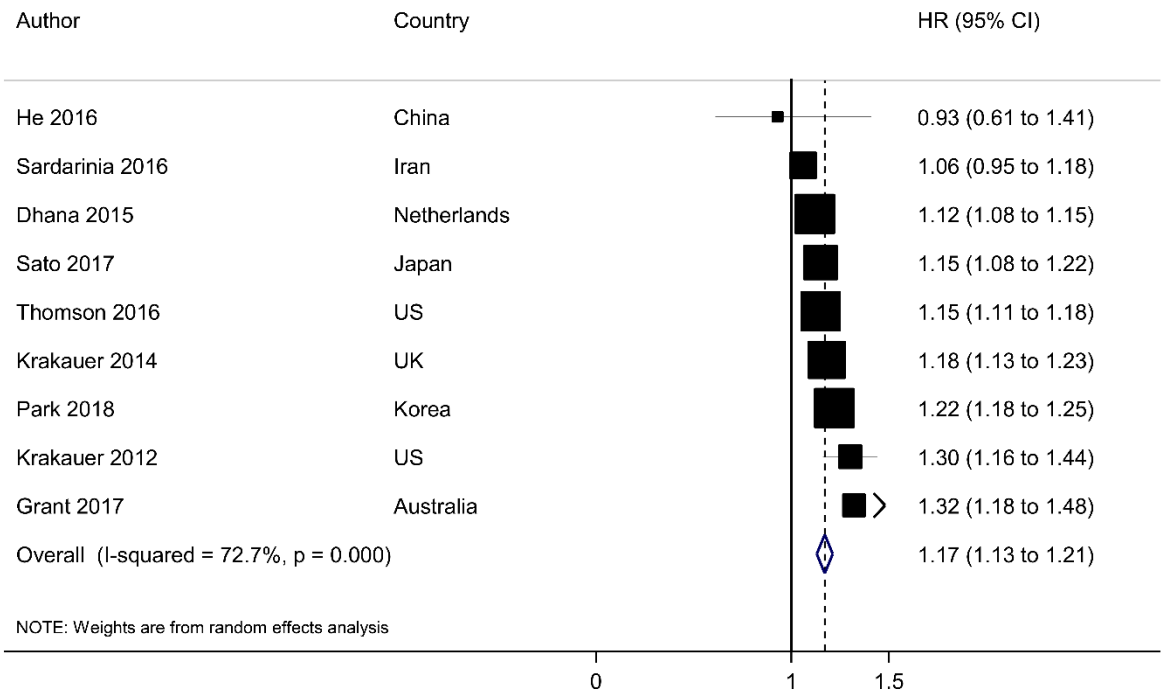

Figure S11. Summary hazard ratio of all-cause mortality for a one standard deviation increment in A Body Shape Index. HR: hazard ratio.

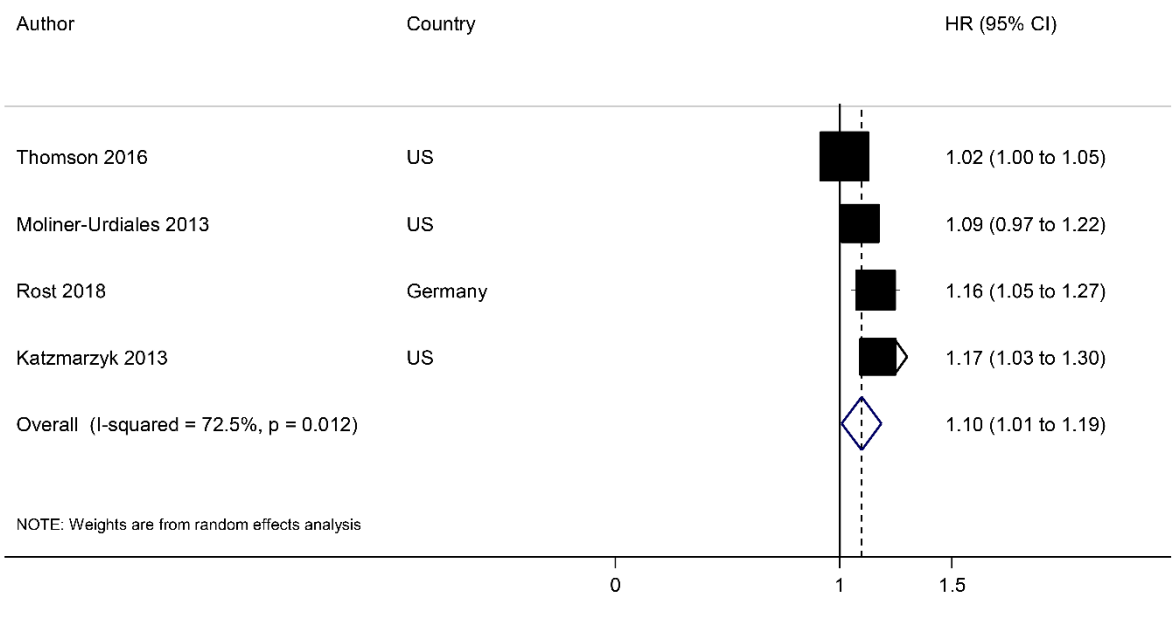

Figure S12. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Body Adiposity Index. HR: hazard ratio.

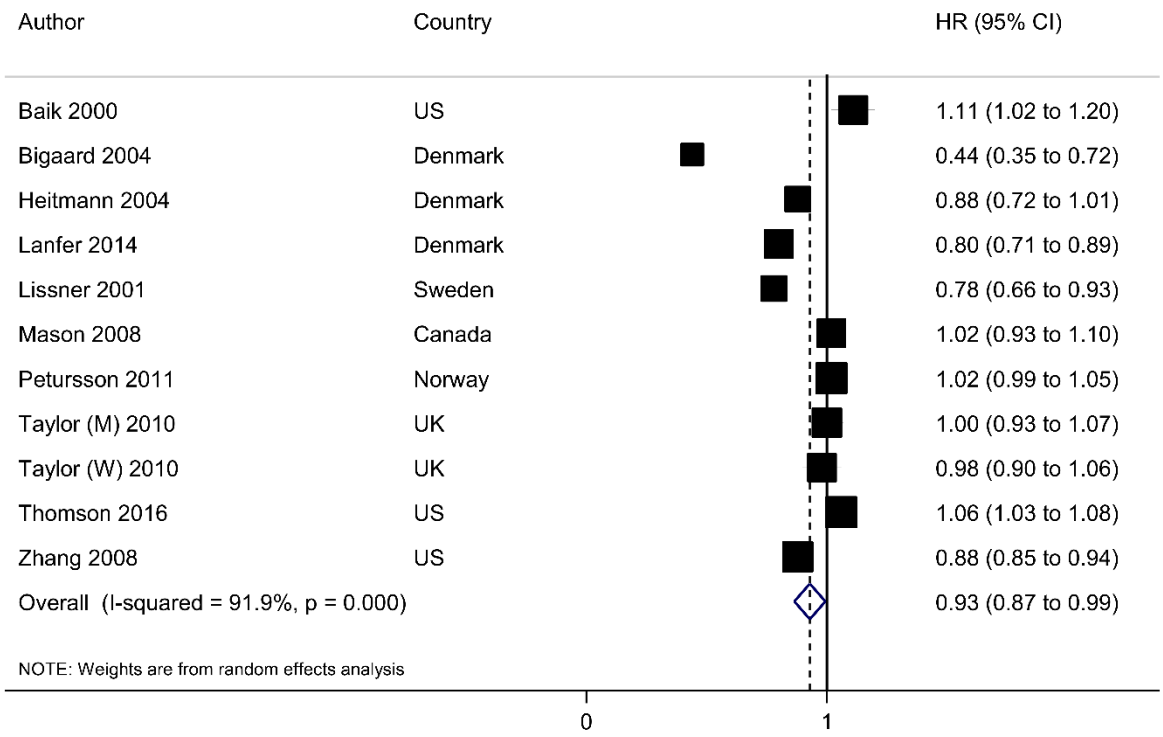

Figure S13. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Hip Circumference. HR: hazard ratio; M, men; W, women.

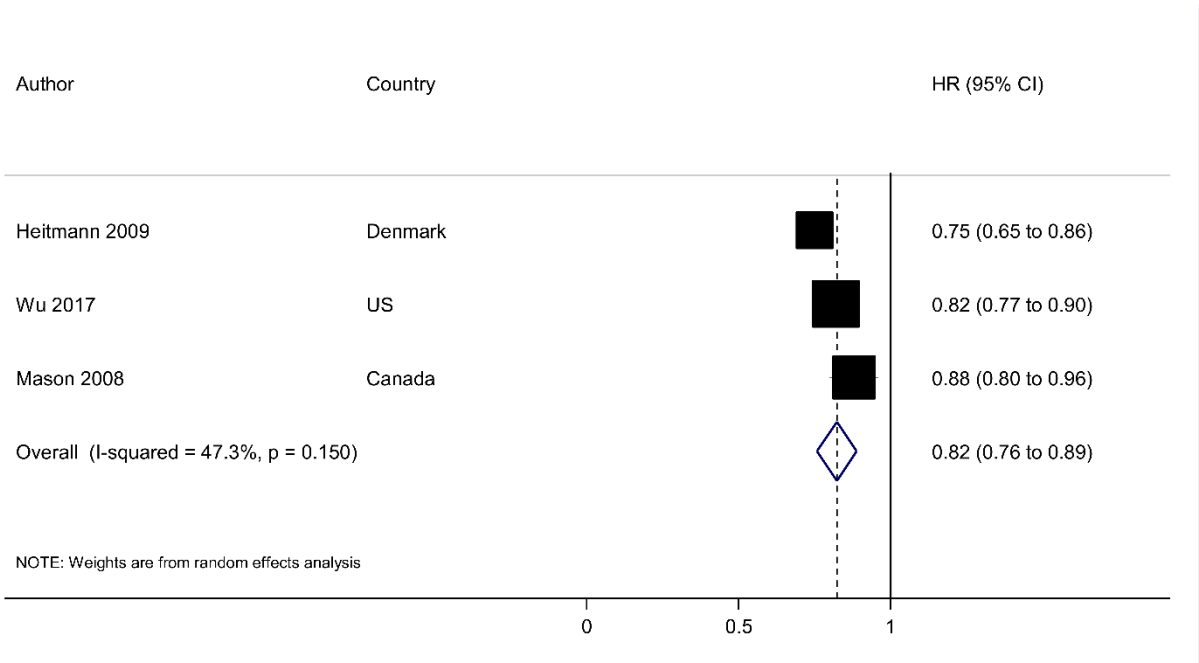

Figure S14. Summary hazard ratio of all-cause mortality for a one standard deviation increment in Thigh Circumference. HR, hazard ratio.