SUPPLEMENTAL MATERIAL

Aune D, Sen A, Schlesinger S, Norat T, Janszky I, Romundstad P, Tonstad S, Riboli E, Vatten LJ. Body mass index, abdominal fatness, fat mass and the risk of atrial fibrillation: a systematic review and dose-response meta-analysis of prospective studies: Eur J Epidemiol 2017; DOI: 10.1007/s10654-017-0232-4

Supplementary Table 1. PubMed search

1	“body mass index”
2	BMI
3	overweight
4	obesity
5	anthropometry
6	fatness
7	“body fatness”
8	“abdominal fatness”
9	“abdominal obesity”
10	“waist circumference”
11	“waist-to-hip ratio”
12	adiposity
13	“weight gain”
14	“weight change”
15	“weight loss”
16	“atrial fibrillation”
17	“atrial flutter”
18	1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15
19	16 OR 17
20	18 AND 19

Supplementary Table 2.Embase search

1	body mass index/
2	BMI/
3	overweight/
4	obesity/
5	anthropometry/
6	fatness/
7	body fatness/
8	abdominal fatness/
9	abdominal obesity/
10	waist circumference/
11	waist-to-hip ratio/
12	adiposity/
13	weight gain/
14	weight change/
15	weight loss/
16	atrial fibrillation/
17	atrial flutter/
18	case-control
19	cohort
20	cohorts
21	prospective
22	longitudinal
23	retrospective

24	follow-up
25	cross-sectional
26	hazard ratio
27	hazard ratios
28	relative risk
29	relative risks
30	incidence rate ratio
31	incidence rate ratios
32	odds ratio
33	odds ratios
34	incidence
35	1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15
36	16 OR 17
37	18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34
38	35 AND 36 AND 37

Supplementary Table 3.List of excluded studies and reasons for exclusion.

Exclusion reason	Reference number
Abstract	(1-40)
Case-control study	(41-49)
Cross-sectional study	(50-71)
Duplicates	(72-81)
High risk patients	(82)
Letter, News, comments, editorial	(83-104)
Meta-analysis	(105-107)
No risk estimates	(108)
Non-English	(109)
Not relevant data	(110-123)
Patient population, progression, recurrence	(124-222)
Review	(223-260)
<3 categories of exposure	(261-267)

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Supplementary Table 4: Prospective studies of adiposity and atrial fibrillation risk

Author, publication year, country/ region	Study name	Recruitment and follow-up period	Study size, gender, age, number of cases	Assessment of weight and height	Exposure by subgroup	Description of quantiles of categories	RR (95% CI)	Adjustment for confounders
Wilhelmsen L et al, 2001, Sweden	The Multifactor Primary Prevention Study	1970-1973 – 1996, 25.2 years follow-up	7495 men, age 47-55 years: 754 AF cases	Measured	Body weight	≤72.9 kg 73.0-83.9 ≥84.0	1.00 1.58 (1.28-1.93) 2.19 (1.78-2.69)	Age
Wang TJ et al, 2004, USA	Framingham Heart Study	1979-1982/1979-1983 – 1999, 13.7 years follow-up	5282 men and women, age 35-90 years: 526 AF cases	Measured	BMI, men BMI, women BMI, men BMI, women	<25.0 25.0-<30.0 ≥30.0 Per 1 unit <25.0 25.0-<30.0 ≥30.0 Per 1 unit <25.0 25.0-<30.0 ≥30.0 Per 1 unit <25.0 25.0-<30.0 ≥30.0 Per 1 unit	1.00 1.09 (0.82-1.43) 1.49 (1.06-2.09) 1.04 (1.01-1.07) 1.00 1.20 (0.90-1.62) 1.59 (1.13-2.22) 1.04 (1.01-1.07) 1.00 1.10 (0.84-1.46) 1.52 (1.09-2.13) 1.04 (1.01-1.07) 1.00 1.13 (0.84-1.52) 1.46 (1.03-2.07) 1.04 (1.01-1.07)	Age, SBP, use of antihypertensive therapy, DM, ECG –LVH, prior MI or CHF, cigarette smoking, significant heart murmur +adjusted for interim MI/CHF
Frost L et al, 2005, Denmark	Danish Diet, Cancer, and Health Study	1993-2001, 5.7 years follow-up	22482 men and 25107 women, age 50-64 years: 553 AF cases	Measured	BMI, men BMI, women	18.5-25.0 25.0-30.0 ≥30.0 Per 1 unit 18.5-25.0 25.0-30.0 ≥30.0 Per 1 unit	1.00 1.75 (1.35-2.27) 2.35 (1.70-3.25) 1.08 (1.05-1.11) 1.00 1.39 (0.99-1.94) 1.99 (1.31-3.02) 1.06 (1.03-1.09)	Age, height, length of education, smoking status, alcohol, total cholesterol, hypertension treatment, SBP
Murphy NF et al, 2006, United Kingdom	Renfrew-Paisley Study	1972-1976 - NA, 20 years follow-up	15402 men and women, age 45-64 years: 5 AF deaths	Measured	BMI, all BMI, men BMI, women BMI, all	Per unit Per unit Per unit 18.5-24.9	1.08 (0.94-1.25) 1.04 (0.52-2.06) 1.07 (0.92-1.25) 1.00	Age, sex (all), adjusted FEV1, cigarettes per day, social class

						25.0-29.9 ≥30.0 Per unit	1.12 (0.80-1.57) 1.64 (1.07-2.51) 1.05 (1.01-1.08)	
					BMI, men	18.5-24.9 25.0-29.9 ≥30.0 Per unit	1.00 1.19 (0.74-1.92) 0.96 (0.42-2.20) 0.99 (0.93-1.06)	
					BMI, women	18.5-24.9 25.0-29.9 ≥30.0 Per unit	1.00 1.02 (0.63-1.64) 2.02 (1.20-3.39) 1.06 (1.02-1.11)	
Gami AS et al, 2007, USA	Olmsted County Study	1987-2003, 4.7 years follow-up	3542 men and women, mean age 49 years: 133 AF cases	Unclear	BMI	Per 1 unit	1.07 (1.05-1.10)	Age, sex, CAD, lowest nocturnal oxygen saturation
Minami M et al, 2009, Japan	Ishikawa Prefecture	1998-2006, NA	69 AF cases (men) 138 controls (nested case-control study)	Unclear	BMI	Per 1 unit	1.11 (0.98-1.26)	Age, time period, SBP, TCH, gamma-glutamyltranspeptidase, uric acid, fasting plasma glucose, hemoglobin, cardiomegaly, Brinkman index, alcohol
Rosengren A et al, 2009, Sweden	The Multifactor Primary Prevention Study	1970-1973 - 2004, 34.3 years follow-up	6903 men, age 47-56 years: 1253 AF hospital discharge diagnosis cases	Measured (current) Self-reported (weight at age 20 years)	BMI at age 20	<21 21-22.2 22.3-23.7 >23.7 Per 1 unit	1.00 1.02 (0.87-1.20) 1.06 (0.91-1.25) 1.28 (1.10-1.50) 1.05 (1.02-1.08)	Age
					Midlife BMI	<20.00 20.00-22.49 22.50-24.99 25.00-27.49 27.50-29.99 ≥30.00 Per 1 unit	1.11 (0.67-1.78) 1.00 1.15 (0.94-1.41) 1.32 (1.10-1.66) 1.50 (1.21-1.88) 1.56 (1.20-2.02) 1.04 (1.02-1.06)	Age, intercurrent heart failure, intercurrent MI, SBP, treatment for hypertension, smoking, diabetes, alcohol, occupational class
					Body surface area	<1.75 m^2 1.75-1.83 1.83-1.91 >1.91	1.00 1.39 (1.16-1.66) 1.52 (1.28-1.81) 1.95 (1.65-2.31)	
					Weight change from age 20 to midlife	Loss of more than 4% -4 to +4% +5-15% +16-35%	1.11 (0.84-1.47) 1.00 1.08 (0.90-1.30) 1.22 (1.02-1.47)	

						+>35%	1.31 (1.02-1.68)	
Schnabel RB et al, 2010, Iceland	Age, Gene/ Environment Susceptibility-Reykjavik Study	2002-2006 – 2008, 5 years follow-up	4238 men and women, age 45-95 years: 226 AF cases	Measured	BMI	Per 5 units	1.22 (1.05-1.41)	Age, sex, SBP, hypertension treatment, PR interval, prevalent heart failure
Schnabel RB et al, 2010, USA	Cardiovascular Health Study	1989-1990/ 1992-1993 – 2005, 5 years follow-up	5410 men and women, age 45-95 years: 958 AF cases	Measured	BMI, whites BMI, African Americans	Per 5 units Per 5 units	1.14 (1.05-1.23) 1.29 (1.10-1.51)	Age, sex, SBP, hypertension treatment, PR interval, valvular heart disease (whites only), prevalent heart failure
Hodgkinson JA et al, 2011, United Kingdom	UK General Practice Research Database	1987-2007, NA	44348 AF cases 161104 controls (nested case-control study)	Measured	BMI	10-19 20-24 25-29 ≥30	1.14 (1.09-1.19) 1.00 1.02 (0.91-1.14) 1.29 (1.15-1.45)	Age, sex, practice, calendar time, COPD, cerebrovascular accident, diabetes, heart failure, hyperthyroidism, IHD, hypertension, bisphosphonates, oral glucocorticoids, statins, xanthine derivate, beta-2 agonists, drugs affecting the renin-angiotensin-aldosterone system, alcohol, smoking
Grundvold I et al, 2012, Norway	Oslo Cardiovascular Health Survey	1972-1975 – 2008, 30 years follow-up	2014 men, age 40-59 years: 270 AF cases	Measured	BMI	Per 2.8 units	1.16 (1.02-1.32)	Age, SBP, DBP, physical fitness, exercise maximal heart rated, pulse pressure, exercise maximal SBP
Korda RJ et al, 2012, Australia	The 45 and Up Study	2006-2009, 2.3 years follow-up	246361 men and women, age ≥45 years: 1880 AF cases	Self-reported	BMI, age 45-64 years BMI, age 65-79 years BMI, age ≥80 years	18.5-<25.0 25.0-<30.0 ≥30.0 18.5-<25.0 25.0-<30.0 ≥30.0 18.5-<25.0 25.0-<30.0 ≥30.0	1.00 1.37 (1.09-1.72) 1.84 (1.45-2.33) 1.00 1.07 (0.91-1.26) 1.33 (1.11-1.60) 1.00 1.04 (0.87-1.25) 1.15 (0.88-1.50)	Age, sex, region of residence, household income, smoking, alcohol, private health insurance status,
Alonso A et al, 2013, USA	Framingham Heart Study Offspring cohort	1995-1998 - 2005, NA years of follow-up	2838 men and women, mean age 60 years: 143 cases	Measured	Weight	Per 15 kg	1.22 (1.03-1.44)	Age, sex
Alonso A et al, 2013, USA	Cardiovascular Health Study	1989-1990, 1992-1993 - 2000, NA years	5043 men and women, age ≥65 years: 624 cases	Measured	Weight, whites Weight, blacks	Per 15 kg Per 15 kg	1.18 (1.07-1.31) 1.31 (1.04-1.65)	Age, sex

		of follow-up						
Alonso A et al, 2013, USA	Atherosclerosis Risk in Communities Cohort	1996-1998, - 2005, NA years of follow-up	10675 men and women, age 45-64 years: 419 cases	Measured	Weight, whites Weight, blacks	Per 15 kg Per 15 kg	1.39 (1.26-1.53) 1.44 (1.08-1.91)	Age, sex
Alonso A et al, 2013, Island	Age, Gene/ Environment Susceptibility Reykjavik Study	2002-2006 - 2011, NA years of follow-up	4469 men and women, mean age 76 years: 408 cases	Measured	Weight	Per 15 kg	1.17 (1.04-1.31)	Age, sex
Alonso A et al, 2013, Netherlands	Rotterdam Study	1997-2005, NA years of follow-up	3203 men and women, age ≥55 years: 177 cases	Measured	Weight	Per 15 kg	1.55 (1.28-1.87)	Age, sex
Conen D et al, 2013, USA	Women's Health Study	NA-2011, 16.4 years follow-up	34713 women, age ≥45 years: 796 AF cases	Self-reported	Body weight	Per 10 kg	1.07 (0.998-1.14)	Age, hypertension, diabetes, race, education, alcohol, smoking, exercise, height
Karasoy D et al, 2013, Denmark	Danish Pregnant Women	2004-2009 - 2010, 4.6 years follow-up	271203 women, mean age 30.6 years: 110 AF hospitalizations	Measured	BMI	<18.5 18.5-25 25-29.9 30-35 >35	1.65 (0.88-3.35) 1.00 1.13 (0.68-1.88) 2.04 (1.13-3.69) 3.50 (1.86-6.58)	Age, hyperthyroidism, previous use of beta-blockers
Nyrnes A et al, 2013, Norway	The Tromsø study	1994-1995 - 2007, 11 years follow-up	22815 men and women, age 25-96 years: 461/361 AF cases	Measured	BMI, all AF, men BMI, lone AF, men BMI, all AF, women BMI, lone AF, women	Per 3.2 units Per 3.2 units Per 4.1 units Per 4.1 units	1.16 (1.06-1.27) 1.47 (1.32-1.63) 1.47 (0.90-2.40) 2.13 (1.47-3.09)	Age, height, total cholesterol, HDL-cholesterol, hypertension, palpitations, diabetes (all AF only), CHD (all AF only)
Azarbal F et al, 2014, USA	Women's Health Initiative	1994-1998 – 2011, 11.5 years follow-up	81317 women, age 50-79 years: 9792 AF cases	Measured	BMI	Per 5 units	1.12 (1.10-1.14)	Age, race/ethnicity, education, hypertension, diabetes, hyperlipidemia, CAD, heart failure, PAD, current smoking, physical activity
Reeves GK et al, 2014, United Kingdom	Million Women's Study	1996-2001 – 2008, 9.2 years follow-up	1251619 women, age 50-64 years: 11078 AF hospitalizations	Self-reported	BMI	<22.5 22.5-24.9 25.0-29.9 30.0-34.9 ≥35.0 Per 5 units	0.95 (0.91-1.00) 1.00 (0.96-1.04) 1.24 (1.20-1.28) 1.75 (1.67-1.82) 2.90 (2.74-3.07) 1.43 (1.40-1.46)	Age, geographical region, SES, age at 1st birth, parity, smoking status, alcohol intake, physical activity, time since menopause, HRT use
Huxley RR et	Atherosclerosis	1987-2009,	14219 men and	Measured	BMI	18.5-24.9	1.00	Age, sex, race, study site, education,

al, 2014, USA	Risk in Communities Study	~18.2 years follow-up	women, age 45-64 years: 1775 AF cases		Waist circumference Weight change, men Weight change, women 	25.0-29.9 ≥30.0 ≤92/≤84 cm 93-98/85-94 99-105/95-105 ≥106/≥106 >5% loss 0-5% loss 0 to 4.9% gain 5-9.9 gain ≥10% gain >5% loss 0-5% loss 0 to 4.9% gain 5-9.9 gain ≥10% gain	1.20 (1.06-1.36) 1.95 (1.72-2.21) 1.00 1.18 (1.01-1.37) 1.52 (1.31-1.76) 2.13 (1.85-2.46) 1.52 (1.16-1.99) 1.01 (0.79-1.31) 1.00 1.33 (1.04-1.70) 1.61 (1.24-2.11) 1.45 (1.08-1.93) 1.24 (0.93-1.64) 1.00 1.24 (0.94-1.62) 1.19 (0.90-1.55)	income, prior CVD, cigarette smoking, height, physical activity, alcohol
Sandhu RK et al, 2014, USA	Women's Health Study	1993 – 2004, 16.4 years follow-up	34720 women, age ≥45 years: 690 paroxysmal AF cases 349 nonparoxysmal AF cases	Self-reported	BMI, paroxysmal AF BMI, nonparoxysmal AF BMI, paroxysmal AF BMI, nonparoxysmal AF 	<25 25-<30 ≥30 Per 1 unit <25 25-<30 ≥30 Per 1 unit <25 25-<30 ≥30 Per 1 unit <25 25-<30 ≥30 Per 1 unit	1.00 1.30 (1.08-1.55) 1.49 (1.22-1.83) 1.03 (1.02-1.05) 1.00 1.51 (1.15-1.97) 2.56 (1.93-3.40) 1.07 (1.05-1.09) 1.00 1.30 (1.08-1.55) 1.50 (1.22-1.84) 1.03 (1.02-1.05) 1.00 1.51 (1.15-1.97) 2.57 (1.93-3.40) 1.07 (1.05-1.09)	Age, aspirin, vitamin E, beta-carotene, hypertension, diabetes, cholesterol, alcohol, smoking, exercise, + interim MI, stroke, revascularization, heart failure
Frost L et al, 2014, Denmark	Danish Diet, Cancer and Health Study	1993-1997 - 13.5 years follow-up	55273 men and women, age 50-64 years: 1669/912 AF cases	Measured	Weight Weight, adj. height BMI Waist circumference Hip circumference WHR Fat mass	Per 14.1 kg Per 14.1 kg Per 4.1 units Per 12.7 cm Per 7.9 cm Per 0.10 units Per 8.3 kg	1.36 (1.31-1.40) 1.29 (1.24-1.34) 1.26 (1.21-1.30) 1.28 (1.23-1.33) 1.29 (1.24-1.33) 1.11 (1.07-1.16) 1.29 (1.24-1.33)	Age, smoking status, fruit and vegetables, alcohol, physical activity, total energy, education, hypertension, diabetes, hypercholesterolemia, IHD, CHF, vascular heart disease

					Fat mass, adj. LBM Fat% Lean body mass LBM, adj. height LBM, adj. fat mass	Per 8.3 kg Per 7.4% Per 9.7 kg Per 9.7 kg Per 9.7 kg	1.03 (0.99-1.09) 1.19 (1.14-1.24) 1.40 (1.35-1.45) 1.38 (1.32-1.45) 1.37 (1.30-1.44)	
Schmidt M et al, 2014, Denmark	Danish Military Conscripts	1977-2012, 26 years follow-up	12850 men, median age 19 years: 227 AF cases	Measured	BMI	<18.5 18.5-24.9 25.0-29.9 ≥30.0	0.99 (0.52-1.87) 1.00 2.08 (1.48-2.92) 2.87 (1.46-5.62)	Years of education, height
Knuiman M et al, 2014, Australia	The Busselton Health Study	1994-1995 - 2010, 15 years follow-up	4267 men and women, age 25-84 years: 343 AF cases	Measured	BMI WC WHR	Per 4.2 units Per 12.7 cm Per 0.09 units	1.34 (1.21-1.49) 1.37 (1.21-1.55) 1.21 (1.02-1.43)	Age, sex, height
Aronis KN et al, 2015, USA	Health, Aging, and Body Composition Study	1997-1998 – 2008, 10 years follow-up	2717 men and women, mean age 74 years: 371 AF cases	Measured	BMI, all Abdominal circumference SAT VAT SAT+VAT Total fat mass Total fat percent BMI, whites Abdominal circumference SAT VAT SAT+VAT Total fat mass Total fat percent BMI, blacks Abdominal circumference SAT VAT SAT+VAT Total fat mass Total fat percent	Per 4.7 units Per 13 cm Per 120 cm^2 Per 67 cm^2 Per 1 SD Per 9 kg Per 8% Per 4.7 units Per 13 cm Per 120 cm^2 Per 67 cm^2 Per 1 SD Per 9 kg Per 8% Per 4.7 units Per 13 cm Per 120 cm^2 Per 67 cm^2 Per 1 SD Per 9 kg Per 8%	1.14 (1.02-1.28) 1.16 (1.04-1.28) 1.11 (0.97-1.27) 1.07 (0.96-1.19) 1.10 (0.98-1.25) 1.13 (1.002-1.27) 1.03 (0.87-1.22) 1.11 (0.96-1.30) 1.13 (0.94-1.36) 1.16 (0.98-1.38) 1.04 (0.92-1.19) 1.12 (0.96-1.30) 1.16 (0.99-1.34) 1.06 (0.85-1.31) 1.13 (0.94-1.36) 1.27 (1.06-1.52) 0.98 (0.78-1.22) 1.16 (0.93-1.45) 1.04 (0.84-1.29) 1.04 (0.86-1.27) 0.92 (0.69-1.23)	Age, sex, race, site, smoking, adiposity measure, systolic and diastolic blood pressure, treatment of hypertension, total to HDL cholesterol ratio, heart rate, ECG left ventricular hypertrophy, PR interval, prevalent heart failure, coronary artery disease, diabetes
Azarbal F et al, 2015, USA	Women's Health Initiative	1994-1998 – 2011,11.6 years follow-up	8832 women, mean age 63.3 years: 1035 AF cases	Measured	BMI Total body lean mass Central lean mass	Per 5 units Per 5 units Per 5 units	1.07 (1.01-1.13) 1.21 (1.14-1.29) 1.49 (1.31-1.69)	Age, ethnicity, education, hypertension, diabetes, hyperlipidemia, coronary artery

					Peripheral lean mass Total LBMI Central LBMI Peripheral LBMI Total body fat mass Central fat mass Peripheral fat mass Total body fat% Central fat% of central mass Central fat% of total fat mass	Per 5 units Per 5 units Per 5 units Per 5 units Per 5 kg Per 5 kg Per 5 kg Per 5 % Per 5 % Per 5 %	1.37 (1.21-1.56) 1.39 (1.15-1.67) 2.03 (1.41-2.91) 1.74 (1.22-2.50) 1.04 (1.01-1.07) 1.05 (1.00-1.11) 1.10 (1.04-1.16) 1.00 (0.95-1.04) 0.98 (0.94-1.03) 0.95 (0.90-0.99)	disease, heart failure, peripheral artery disease, smoking, dietary modification, and hormone intervention
Vermond RA et al, 2015, Netherlands	Prevention of Renal and Vascular End-Stage Disease	NA-2008, 9.7 years follow-up	8265 men and women, age 28-75 years: 265 AF cases	Measured	BMI	Per 5 units	1.45 (1.21-1.74)	Age, sex
Nyström PK et al, 2015, Sweden	Stockholm County Study	1997-1999 – 2012, 13.6 years follow-up	1924 men and 2097 women, age 60 years: 285 AF cases	Measured	Weight Waist circumference Hip circumference SAD BMI WHR BMI, no MetS BMI, MetS BMI, no MetS BMI, MetS BMI, no MetS BMI, MetS WC, no MetS WC, MetS WC, no MetS WC, MetS WC, no MetS WC, MetS	Per 14.2 kg Per 12.4 cm Per 8.4 cm Per 2.9 cm Per 4.2 kg/m^2 Per 0.087 units 18.5-24.9 18.5-24.9 25.0-29.9 25.0-29.9 ≥30.0 ≥30.0 <94/<80 cm <94/<80 cm 94-101.9/80-87.9 94-101.9/80-87.9 ≥102/≥88 ≥102/≥88	1.47 (1.31-1.65) 1.35 (1.19-1.54) 1.38 (1.24-1.53) 1.28 (1.14-1.44) 1.25 (1.12-1.40) 1.05 (0.88-1.25) 1.00 1.17 (0.51-2.70) 1.01 (0.73-1.40) 1.67 (1.16-2.41) 1.75 (1.11-2.74) 1.92 (1.34-2.74) 1.00 1.45 (0.88-2.38) 1.19 (0.80-1.78) 1.33 (0.86-2.04) 1.37 (0.91-2.07) 2.03 (1.44-2.87)	Hypertension, elevated fasting glucose, sex, smoking, alcohol, history of MI, regular moderate-intensity physical activity, Swedish-born
Kokubo Y et al, 2015, Japan	The Suita Study	1989-1996/1996-1998/1992-2006 – 2013, 12.8 years	6906 men and women, age 30-84 years: 253 AF cases	Measured	BMI	<18.5 18.5-<25.0 ≥25.0	1.02 (0.60-1.72) 1.00 1.35 (1.01-1.80)	Age, sex, blood pressure, smoking, drinking, hyperlipidemia, diabetes mellitus, impaired fasting glucose

		follow-up						
Berkovitch A et al, 2016, Israel	The Institute for Medical Screening of the Chaim Sheba Medical Center	2000 - NA, 6.4 years follow-up	18290 men and women, mean age 48.9 years: 288 AF cases	Measured	BMI	18.5-24.9 25.0-29.9 ≥30.0	1.00 1.49 (1.11-2.00) 2.34 (1.64-3.34)	Age, sex, IHD, diabetes mellitus, hypertension, LDL cholesterol, HDL cholesterol, physical activity
Diouf I et al, 2016, Australia	Australian Diabetes, Obesity and Lifestyle study cohort	1999/2000 - 2004/2005, 5 years follow-up	5389 men and women, age ≥35 years: 53 AF cases	Measured	BMI	18.5-24.9 25.0-29.9 ≥30.0	1.0 1.0 (0.7-1.5) 1.4 (0.5-4.2)	Age, sex, smoking status, usual number of alcoholic drinks, physical activity, level of education
Karas MG et al, 2016, USA	Cardiovascular Health Study	1989-2008, 13 years follow-up	4276 men and women, age ≥65 years: 1050 AF cases	Measured	BMI Weight Waist circumference Hip circumference WHR Fat mass Fat-free mass	Per 4.7 units Per 14.6 kg Per 13.2 cm Per 10.0 cm Per 0.09 units Per 10.8 kg Per 9.2 kg	1.08 (1.02-1.15) 1.21 (1.13-1.29) 1.14 (1.07-1.22) 1.17 (1.10-1.24) 1.02 (0.96-1.10) 1.16 (1.09-1.24) 1.26 (1.13-1.40)	Age, sex, race, smoking status
Kang SH et al, 2016, Korea	Korea National Health Insurance Corporation Study	2003-2004 - NA, 9.0 years follow-up	132063 men and women, age ≥40 years: 3237 AF cases	Measured	BMI, all BMI, men BMI, women 	<18.5 18.5-22.9 23.0-24.9 25.0-29.9 ≥30.0 <18.5 18.5-22.9 23.0-24.9 25.0-29.9 ≥30.0 <18.5 18.5-22.9 23.0-24.9 25.0-29.9 ≥30.0	1.23 (1.00-1.52) 1.00 1.15 (1.05-1.27) 1.26 (1.16-1.38) 2.20 (1.87-2.59) 1.17 (0.90-1.53) 1.00 1.09 (0.97-1.23) 1.22 (1.09-1.37) 2.17 (1.71-2.75) 1.32 (0.95-1.84) 1.00 1.24 (1.07-1.44) 1.30 (1.13-1.50) 2.22 (1.77-2.79)	Age, sex, alcohol, exercise frequency, hypertension, diabetes, ischemic heart disease, congestive heart failure, chronic kidney disease, chronic lung disease, malignancy, thyroid disease, fasting glucose, urine protein
Lee JJ et al, 2016, USA	Framingham Heart Study Offspring and Third-Generation	1998-2001 and 2002-2005 - NA, 9.7 years follow-up	2135 men and women, age : 162 AF cases	Measured	Pericardial fat Intrathoracic fat Abdominal visceral fat	Per 46 cm^3 Per 63 cm^3 Per 1061 cm^3	1.13 (0.99-1.30) 1.19 (1.01-1.40) 1.09 (0.93-1.28)	Age, sex, SBP, DBP, current smoking, antihypertensive medication use, diabetes mellitus, history of heart failure, history of myocardial infarction

	Cohorts							

AF=atrial fibrillation, BMI=body mass index, CHD=coronary heart disease, CHF=congestive heart failure, COPD=chronic obstructive pulmonary disease, CVD=cardiovascular disease, DBP=diastolic blood pressure, ECG=electrocardiogram, FEV_1=forced expiratory volume in 1 second, FH=family history, GFR=glomerular filtration rate, HDL=high density lipoprotein, HF=heart failure, HOMA-IR= homeostatic model assessment of insulin resistance, IHD=ischemic heart disease, LDL=low-density lipoprotein, LVH=left ventricular hypertrophy, MH=metabolically health, MI=myocardial infarction, MUH=metabolically unhealthy, NA=not available SBP=systolic blood pressure, WHI=Women's Health Initiative, WHR= waist-to-hip ratio

Supplementary Table 5. Table of RRs and 95% CIs from nonlinear dose-response analysis of BMI and atrial fibrillation

	Atrial fibrillation
BMI	RR (95% CI)
15.0	0.98 (0.90-1.06)
17.5	0.96 (0.93-1.00)
20.0	1.00
22.5	1.09 (1.04-1.13)
25.0	1.21 (1.13-1.31)
27.5	1.39 (1.25-1.56)
30.0	1.63 (1.40-1.89)
32.5	1.93 (1.60-2.32)
35.0	2.32 (1.86-2.90)
37.5	2.82 (2.18-3.66)
40.0	3.45 (2.56-4.64)

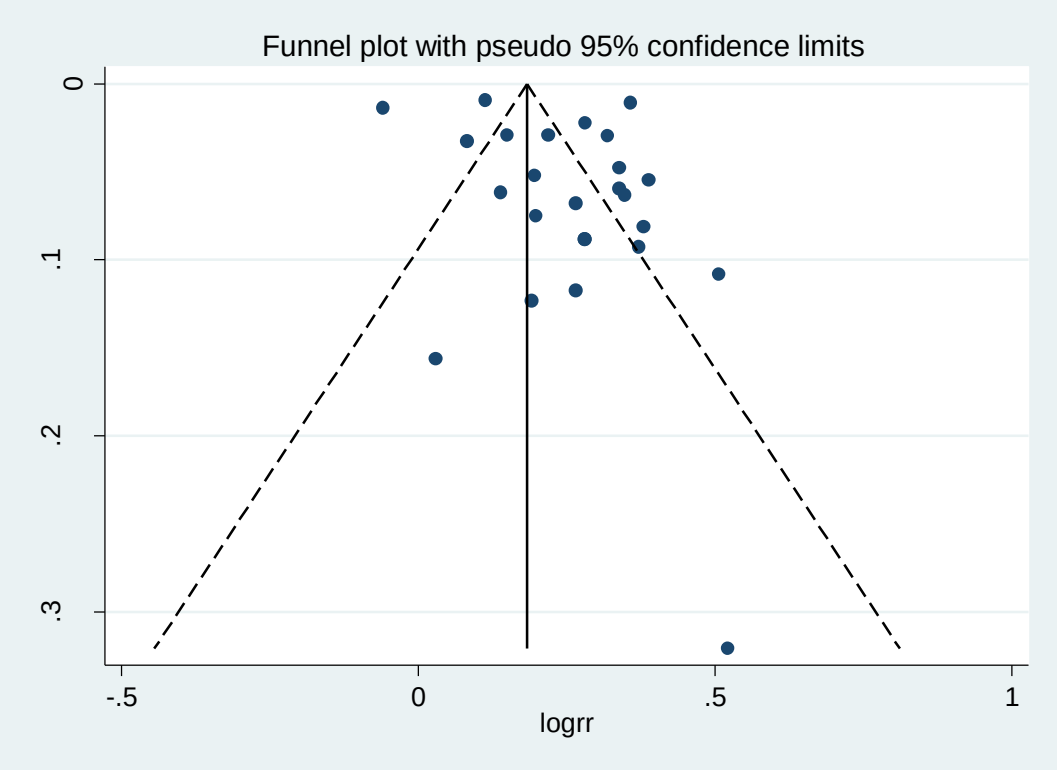
Supplementary Table 6. Table of RRs and 95% CIs from nonlinear dose-response analysis of waist circumference and atrial fibrillation

Men	
WC	RR (95% CI)
76 cm	1.00
80	1.01 (0.89-1.15)
85	1.07 (0.85-1.35)
90	1.18 (0.88-1.57)
95	1.34 (0.97-1.84)
100	1.55 (1.13-2.14)
105	1.84 (1.36-2.49)
110	2.22 (1.69-2.92)

Supplementary Table 7. Table of summary relative risks (95% CIs) from the current meta-analysis

Adiposity variable	N	Increment	Summary RR (95% CI)	I^2	$p_{heterogeneity}$
BMI	25	5 kg/m^2	1.28 (1.20-1.38)	97%	<0.0001
Waist circumference	5	10 cm	1.18 (1.12-1.25)	73%	0.005
Waist-to-hip ratio	4	0.1 units	1.09 (1.02-1.16)	44%	0.15
Hip circumference	3	10 cm	1.32 (1.16-1.51)	91%	<0.0001
Weight	10	5 kg	1.10 (1.08-1.13)	74%	<0.0001
Weight gain	2	5 kg	1.08 (0.97-1.19)	86%	0.007
Body fat mass	4	5 kg	1.09 (1.02-1.16)	94%	<0.0001
Body fat percentage	3	10%	1.10 (0.92-1.33)	90%	<0.0001

Supplementary Figure 1. Funnel plot for BMI and atrial fibrillation incidence



Moose checklist

Reporting of background should include	Page
Problem definition	3-4
Hypothesis statement	4
Description of study outcome(s)	3-4, 5
Type of exposure or intervention used	3-4, 5
Type of study designs used	3-4, 5
Study population	5, Supplementary Table 4
Reporting of search strategy should include	
Qualifications of searchers (eg, librarians and investigators)	5, Investigators
Search strategy, including time period included in the synthesis and keywords	Supplementary Table 1 and 2
Effort to include all available studies, including contact with authors	No contact with authors
Databases and registries searched	5
Search software used, name and version, including special features used (eg, explosion)	5, Supplementary Table 1 and 2
Use of hand searching (eg, reference lists of obtained articles)	5
List of citations located and those excluded, including justification	Supplementary Table 3
Method of addressing articles published in languages other than English	5, only English language publications were included
Method of handling abstracts and unpublished studies	5, not included
Description of any contact with authors	No contact with authors
Reporting of methods should include	
Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	5-6
Rationale for the selection and coding of data (eg, sound clinical principles or convenience)	5-6
Documentation of how data were classified and coded (eg, multiple raters, blinding, and interrater reliability)	6
Assessment of confounding (eg, comparability of cases and controls in studies where appropriate)	Table 1, Supplementary Table 4
Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	5, 11, Table 1
Assessment of heterogeneity	7

Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	6-7
Provision of appropriate tables and graphics	8-11, Supplementary Table 1-4
Reporting of results should include	
Graphic summarizing individual study estimates and overall estimate	8-11, Figure 2-5, Table 1
Table giving descriptive information for each study included	Supplementary Table 4
Results of sensitivity testing (eg, subgroup analysis)	10-11, Table 1
Indication of statistical uncertainty of findings	8-11
Reporting of discussion should include	
Quantitative assessment of bias (eg, publication bias)	14
Justification for exclusion (eg, exclusion of non–English-language citations)	No relevant non-English publications were identified
Assessment of quality of included studies	15
Reporting of conclusions should include	
Consideration of alternative explanations for observed results	13-14
Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review)	14-15
Guidelines for future research	15
Disclosure of funding source	16