IARC HANDBOOKS

ABSENCE OF EXCESS BODY FATNESS

VOLUME 16

This publication represents the views and expert opinions of an IARC Working Group on the Evaluation of Cancer-Preventive Interventions, which met in Lyon, 5–12 April 2016

LYON, FRANCE - 2018

IARC HANDBOOKS OF CANCER PREVENTION

International Agency for Research on Cancer

World Health Organization

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Hodgkin lymphoma							
Samanic et al. (2004) United States Veterans cohort USA 1969–1996	4 500 700 Men Incidence	Hodgkin lymphoma ICD-9: 201	Obesity			Age, calendar year	Obesity defined as discharge diagnosis of obesity: ICD-8: 277; ICD-9: 278.0
				White men:			
			Non-obese	1239	1.00		
			Obese	70	1.11 (0.87–1.41)		
				Black men:			
			Non-obese	248	1.00		
			Obese	14	1.39 (0.79–2.43)		
Samanic et al. (2006) Swedish Construction Worker Cohort Sweden 1958–1999	362 552 Men Incidence	Hodgkin lymphoma ICD-7: 201	BMI			Attained age, calendar year, smoking	
			18.5–24.9	134	1.00		
			25–29.9	61	0.90 (0.66–1.24)		
			≥ 30	16	1.59 (0.94–2.71)		
			[P_{trend}]		[0.34]		
Engeland et al. (2007) Norwegian cohort Norway 1963–2001	963 709 Men Incidence	Hodgkin lymphoma	BMI			Age, birth cohort	
			< 18.5	4	0.81 (0.30–2.17)		
			18.5–24.9	427	1.00		
			25–29.9	251	0.89 (0.76–1.04)		
			≥ 30	43	1.13 (0.83–1.56)		
			[P_{trend}]		[0.5]		
	1 038 010 Women Incidence	Hodgkin lymphoma	BMI				
			< 18.5	10	1.23 (0.65–2.33)		
			18.5–24.9	229	1.00		
			25–29.9	156	1.04 (0.84–1.29)		
			30–34.9	76	1.47 (1.12–1.94)		
			35–39.9	21	1.80 (1.14–2.85)		
			≥ 40	7	2.65 (1.24–5.65)		
			[P_{trend}]		[0.002]		
Lim et al. (2007) NIH-AARP cohort USA 1995–2003	473 984 Men and women Incidence	Hodgkin lymphoma ICD-O-2: 9560, 9652–55, 9657–67	BMI			Age, ethnicity, education level, alcohol consumption, cigarette smoking, height, physical activity	
			18.5–24.9	20	1.00		
			25–29.9	23	0.86 (0.47–1.59)		
			≥ 30	14	1.20 (0.60–2.43)		
			[P_{trend}]		[0.63]		

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Larsson & Wolk (2011) Meta-analysis 1999–2010	5 studies Men and women Incidence	Hodgkin lymphoma	BMI (variable cut-off points)				
			Normal		1.00		
			Overweight		0.97 (0.85–1.12)		
			Obese		1.41 (1.14–1.75)		
Non-Hodgkin lymphoma							
Calle et al. (2003) Cancer Prevention Study II USA 1982–1998	404 576 Men Mortality	Non-Hodgkin lymphoma	BMI			Age, education level, smoking status, physical activity, alcohol consumption, marital status, aspirin use, race, fat and vegetable consumption	
			18.5–24.9	518	1.00		
			25–29.9	672	1.08 (0.96–1.21)		
			30–34.9	147	1.56 (1.29–1.87)		
			≥ 35	18	1.49 (0.93–2.39)		
			[P_{trend}]		[< 0.001]		
	495 477 Women Mortality		BMI				
			18.5–24.9	576	1.00		
			25–29.9	327	1.22 (1.06–1.40)		
			30–34.9	88	1.20 (0.95–1.51)		
			≥ 35	38	1.95 (1.39–2.72)		
			[P_{trend}]		[< 0.001]		
Samanic et al. (2004) United States Veterans cohort USA 1969–1996	4 500 700 Men Incidence	Non-Hodgkin lymphoma ICD-9: 200, 202	Obesity			Age, calendar year	Obesity defined as discharge diagnosis of obesity: ICD-8: 277; ICD-9: 278.0
				White men:			
			Non-obese	7511	1.00		
			Obese	449	1.03 (0.94–1.14)		
				Black men:			
			Non-obese	1425	1.00		
			Obese	71	1.17 (0.92–1.49)		
Oh et al. (2005) Korea National Health Insurance Corporation Republic of Korea 1992–2001	781 283 Men Incidence	Non-Hodgkin lymphoma	BMI			Age, smoking, alcohol consumption, physical activity, family history of cancer, urban/rural residence	
			< 18.5	4	0.72 (0.23–2.28)		
			18.5–22.9	11	1.00		
			23–24.9	92	1.13 (0.85–1.51)		
			25–26.9	54	1.18 (0.84–1.65)		
			27–29.9	29	1.54 (0.99–2.75)		
			≥ 30	–	–		
			[P_{trend}]		[0.04]		

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Rapp et al. (2005) Vorarlberg Health Monitoring and Promotion Program Austria 1985–2001	67 447 Men Incidence	Non-Hodgkin lymphoma ICD-9: 200, 202	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 31 45 8	 1.00 1.26 (0.80–2.01) 0.91 (0.41–1.99) [0.86]	Age, smoking status, occupation	
	78 484 Women Incidence		BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 22 24 18	 1.00 1.64 (0.89–3.01) 2.86 (1.49–5.49) [0.002]		
Chiu et al. (2006) Chicago Heart Association Detection Project in Industry USA 1967–2002	20 313 Men Mortality	Non-Hodgkin lymphoma	BMI < 24.12 24.13–26.3 26.31–28.61 ≥ 28.62 [P_{trend}]	 10 21 23 27	 1.0 1.95 (0.92–4.15) 2.09 (0.99–4.40) 2.56 (1.24–5.30) [0.01]	Age, race, smoking	
	15 106 Women Mortality		BMI < 20.99 20.99–23.24 23.25–26.15 ≥ 26.16 [P_{trend}]	 15 13 9 11	 1.0 0.73 (0.34–1.54) 0.43 (0.18–1.00) 0.48 (0.22–1.09) [0.08]		
Samanic et al. (2006) Swedish Construction Worker Cohort Sweden 1958–1999	362 552 Men Incidence	Non-Hodgkin lymphoma ICD-7: 200, 202	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 564 442 71	 1.00 1.02 (0.89–1.16) 1.02 (0.80–1.31) [> 0.5]	Attained age, calendar year, smoking	
Engeland et al. (2007) Norwegian cohort Norway 1963–2001	963 709 Men Incidence	Non-Hodgkin lymphoma	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 23 2381 1732 238	 1.00 (0.66–1.51) 1.00 1.03 (0.97–1.10) 1.16 (1.01–1.32) [0.004]	Age, birth cohort	

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Engeland et al. (2007) (cont.)	1 038 010 Women Incidence		BMI < 18.5 18.5–24.9 25–29.9 30–34.9 35–39.9 ≥ 40 [P_{trend}]	 60 2094 1379 470 110 25	 0.98 (0.76–1.27) 1.00 1.00 (0.93–1.07) 1.07 (0.96–1.18) 1.15 (0.95–1.40) 1.18 (0.79–1.75) [0.1]		
Fujino et al. (2007) Japan Collaborative Cohort Study Japan NR	NR Men Mortality	Non-Hodgkin lymphoma	BMI < 18.5 18.5–24 25–29 ≥ 30	 4 70 8 1	 0.62 (0.22–1.72) 1.00 0.58 (0.28–1.21) 1.26 (0.17–9.11)	Age, area of study	No information provided on follow-up or number of people in study
			Weight (kg) < 55 55–62 ≥ 63	 23 42 19	 1.00 1.71 (1.02–2.87) 0.96 (0.51–1.82)		
	NR Women Mortality		BMI < 18.5 18.5–24 25–29 ≥ 30	 3 40 11 2	 0.72 (0.22–2.34) 1.00 0.99 (0.51–1.94) 1.83 (0.44–7.64)		
			Weight (kg) < 47 47–54 ≥ 55	 17 20 23	 1.00 1.60 (0.83–3.09) 1.66 (0.87–3.17)		
Larsson & Wolk (2007) Meta-analysis of 10 cohort studies 1999–2006	Men and women Incidence and mortality	Non-Hodgkin lymphoma	BMI (variable cut-off points) Normal Overweight Obese per 5 kg/m^2	13 159 total 	 1.00 1.06 (0.99–1.12) 1.19 (1.04–1.37) 1.10 (1.03–1.17)		Also included meta-analyses for subtypes, but did not separate by cohort/case–control
	Men Incidence and mortality		BMI per 5 kg/m^2	8801 total	 1.17 (1.08–1.27)		

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Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Larsson & Wolk (2007) (cont.)	Women Incidence and mortality		BMI per 5 kg/m^2	7157 total	 1.12 (1.02–1.22)		
Lim et al. (2007) NIH-AARP cohort USA 1995–2003	473 984 Men and women Incidence	Non-Hodgkin lymphoma ICD-O-2: 9590–9595, 9670–9675, 9677, 9680–9688, 9690–9698, 9700–9709, 9710–9717, 9761, 9764, 9800–9801, 9820–9828, 9850, 9940–9941, 9970	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 444 606 216 84	 1.00 1.06 (0.93–1.19) 1.07 (0.96–1.20) 1.29 (1.02–1.64) [0.06]	Age, ethnicity, education level, alcohol consumption, cigarette smoking, height, physical activity	
Reeves et al. (2007) Million Women Study United Kingdom 1996–2005	1 222 630 Women Incidence	Non-Hodgkin lymphoma ICD-10: C82–C85	BMI < 22.5 22.5–24.9 25–27.4 27.5–29.9 ≥ 30 per 10 kg/m^2	 283 376 339 204 307	 0.99 (0.88–1.12) 1.00 (0.90–1.11) 1.07 (0.96–1.19) 1.03 (0.90–1.19) 1.19 (1.06–1.34) 1.17 (1.03–1.34)	Age, geographical region, SES, reproductive history, smoking status, alcohol consumption, physical activity	
	1 222 630 Women Mortality	Non-Hodgkin lymphoma ICD-10: C82–C85	BMI < 22.5 22.5–24.9 25–27.4 27.5–29.9 ≥ 30 per 10 kg/m^2	 92 145 118 64 116	 0.85 (0.69–1.04) 1.00 (0.85–1.18) 0.93 (0.78–1.12) 0.80 (0.63–1.02) 1.10 (0.91–1.33) 1.15 (0.92–1.44)	Age, geographical region, SES, reproductive history, smoking status, alcohol consumption, physical activity	

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Maskarinec et al. (2008) Multiethnic Cohort USA 1993–2002	87 079 Men Incidence	Non-Hodgkin lymphoma	BMI < 22.5 22.5–24.9 25.0–29.9 ≥ 30.0 [P_{trend}]	 68 138 193 58	 0.84 (0.63–1.13) 1.00 0.94 (0.75–1.18) 0.96 (0.70–1.32) [0.61]	Age, ethnicity, education level, alcohol consumption	Also included estimates stratified by ethnicity (White, African American, Japanese, and Latino)
	105 972 Women Incidence		BMI < 22.5 22.5–24.9 25.0–29.9 ≥ 30.0 [P_{trend}]	 97 89 110 71	 0.81 (0.61–1.10) 1.00 0.84 (0.63–1.12) 0.95 (0.69–1.32) [0.60]	Age, ethnicity, education level, alcohol consumption, age at first birth	
Renehan et al. (2008) Meta-analysis 1966–2007	6 studies Men Incidence	Non-Hodgkin lymphoma	BMI per 5 kg/m^2		1.06 (1.03–1.09)		Also split up by global region
	7 studies Women Incidence	Non-Hodgkin lymphoma	BMI per 5 kg/m^2		1.07 (1.00–1.14)		Also split up by global region
Song et al. (2008) Korea Medical Insurance Corporation Republic of Korea 1994–2003	170 481 Women Incidence	Non-Hodgkin lymphoma ICD-10: C82–C85	BMI < 18.5 18.5–20.9 21–22.9 23–24.9 25–26.9 27–29.9 ≥ 30 per 1 kg/m^2	 2 14 46 56 29 30 5	 0.37 (0.09–1.53) 0.54 (0.28–1.01) 1.00 0.82 (0.53–1.26) 0.52 (0.31–0.87) 0.90 (0.55–1.49) 0.68 (0.27–1.73) 1.01 (0.96–1.07)	Age, height, smoking status, alcohol consumption, exercise, income	
Whitlock et al. (2009) 57 pooled European and American cohorts Follow-up varied by cohort	894 576 Men and women Mortality	Non-Hodgkin lymphoma ICD-9: 202	BMI, per 5 kg/m^2 For BMI 15–24.9 For BMI 25–50 For BMI 15–50	 193 196	 1.19 (0.70–2.02) 1.09 (0.81–1.47) 1.13 (0.96–1.34)	Study, sex, age, smoking	

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Andreotti et al. (2010) Agricultural Health Study USA 1993–2005	39 628 Men Incidence	Non-Hodgkin lymphoma	BMI < 18.5 18.5–24.9 25–29.9 30–34.9 ≥ 35	 0 31 73 25 2	 – 1.00 1.24 (0.69–2.21) 1.27 (0.63–2.60) –	Race, smoking status, vegetable consumption, exercise, family history of cancer, age	
	28 319 Women Incidence	Non-Hodgkin lymphoma	BMI < 18.5 18.5–24.9 25–29.9 30–34.9 ≥ 35	 2 27 25 6 3	 – 1.00 1.04 (0.60–1.80) 0.62 (0.26–1.50) –		
De Roos et al. (2010) Women's Health Initiative USA 1994–2008	81 219 Women Incidence	Non-Hodgkin lymphoma	BMI < 25 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 154 151 65 31	 1.00 1.18 (0.94–1.48) 1.18 (0.88–1.59) 1.06 (0.72–1.57) [0.42]	Age, minority race, education level, region of the USA, smoking	
Kanda et al. (2010) Japanese men and women Japan 1992–2006	94 547 Men and women Incidence	Non-Hodgkin lymphoma ICD-O-3: 9675(B), 9680, 9684, 9690, 9691, 9695, 9698, 9699, 9835, 9670, 9823, 9702, 9673, 9687, 9689, 9700, 9705, 9709, 9714, 9718, 9719, 9832, 9591	BMI < 18.5 18.5–22.9 23.0–24.9 25–29.9 ≥ 30 per 1 kg/m^2 Weight (kg), quartiles (sex-specific) Men: Women: 30–57 27–49 58–63 50–53 64–69 54–59 70–115 60–98 per 5 kg	 5 78 51 49 5 41 54 45 48 	 0.84 (0.33–2.11) 0.97 (0.68–1.38) 1.00 0.98 (0.66–1.45) 1.00 (0.40–2.52) 1.02 (0.97–1.07) 1.00 1.05 (0.57–1.93) 1.35 (0.74–2.46) 1.14 (0.59–2.21) 1.06 (0.93–1.22)	Age, sex, study area, pack-years of smoking, alcohol consumption	Also included estimates for height

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Troy et al. (2010) PLCO Trial USA 1993–2006	142 982 Men and women Incidence	Non-Hodgkin lymphoma	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 9 351 564 321	 1.23 (0.64–2.39) 1.00 1.16 (1.02–1.33) 1.32 (1.13–1.54) [< 0.01]	Age, race/ethnicity, education level	
			Weight (kg), quartiles (sex-specific) Men: Women: < 77.4 < 61.5 77.4–85.5 61.5–70.0 85.6–95.5 70.1–80.0 > 95.5 > 80.0 [P_{trend}]	 296 288 353 318	 1.00 1.15 (0.98–1.36) 1.35 (1.16–1.58) 1.40 (1.19–1.65) [< 0.001]		
Chu et al. (2011) MJ Health Screening Center Taiwan, China 1997–2007	383 956 Men and women Mortality	Non-Hodgkin lymphoma	BMI < 18.5 18.5–23.9 24–26.9 ≥ 27 [P_{trend}]	 3 68 39 33	 0.22 (0.03–1.57) 1.00 1.06 (0.69–1.64) 1.56 (0.98–2.48) [0.02]	Sex, age, smoking, alcohol consumption, physical activity	
			WC (cm) Men: Women: < 90 < 80 ≥ 90 ≥ 80	 71 68	 1.00 1.86 (1.26–2.73)		
Hemminki et al. (2011) Swedish hospital patients Sweden 1964–2008	30 020 Men and women Incidence	Non-Hodgkin lymphoma	Hospital discharge diagnosis of obesity	54	1.20 (0.90–1.56)	Age, sex, time period, region, SES	Incidence rates vs expected rates
Larsson & Wolk (2011) Meta-analysis 1999–2010	16 studies Men and women Incidence	Non-Hodgkin lymphoma	BMI per 5 kg/m^2		1.07 (1.04–1.10)		
	8 studies Men Incidence	Non-Hodgkin lymphoma	BMI per 5 kg/m^2		1.09 (1.04–1.14)		

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Larsson & Wolk (2011) (cont.)	10 studies Women Incidence	Non-Hodgkin lymphoma	BMI per 5 kg/m^2		1.07 (1.02–1.13)		
	5 Studies Men and women Mortality	Non-Hodgkin lymphoma	BMI per 5 kg/m^2		1.14 (1.04–1.26)		
Kabat et al. (2012) Women's Health Initiative USA 1993–2009	158 975 Women Incidence	Non-Hodgkin lymphoma	BMI < 25 25– < 30 30– < 35 ≥ 35 [P_{trend}]	 391 419 215 98	 1.00 1.11 (0.89–1.25) 1.13 (0.86–1.21) 0.94 (0.86–1.22) [0.77]	Age, smoking, alcohol consumption, education level, ethnicity, physical activity, energy intake, substudy	Also included estimates for height, hip circumference, waist-to-hip ratio, and weight/BMI at ages 18 yr, 35 yr, and 50 yr
			Weight (kg) < 62.0 62.0– < 70.4 70.4– < 81.6 ≥ 81.6 [P_{trend}]	 287 283 308 245	 1.00 0.97 (0.82–1.15) 1.08 (0.91–1.28) 0.92 (0.76–1.12) [0.71]		
			WC (cm) < 76.1 76.1– < 84.6 84.6– < 95.0 > 95.0 [P_{trend}]	 288 292 274 267	 1.00 1.01 (0.85–1.19) 1.00 (0.84–1.19) 0.99 (0.83–1.19) [0.91]		

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Bertrand et al. (2013) Nurses' Health Study and Health Professionals Follow-up Study USA 1976/1986–2008	163 184 Men and women Incidence	Non-Hodgkin lymphoma	Adult BMI per 5 kg/m^2 [P_{trend}]	1889	1.05 (0.91–1.20) [0.52]	Age, height, smoking, physical activity, race	
Health Professionals Follow-up Study	46 390 Men Incidence	Non-Hodgkin lymphoma	Adult BMI 15–22.9 23–24.9 25–26.9 27–29.9 30–45 per 5 kg/m^2 [P_{trend}]	 98 176 164 132 65	 1.00 1.09 (0.85–1.41) 1.10 (0.85–1.42) 1.19 (0.91–1.56) 1.28 (0.92–1.77) 1.13 (1.00–1.29) [0.05]	Age, height, smoking, physical activity, race	
Nurses' Health Study	116 794 Women Incidence	Non-Hodgkin lymphoma	Adult BMI 15–22.9 23–24.9 25–26.9 27–29.9 30–45 per 5 kg/m^2 [P_{trend}]	 467 259 186 167 175	 1.00 0.90 (0.77–1.05) 0.87 (0.73–1.03) 0.87 (0.73–1.04) 1.00 (0.84–1.20) 0.99 (0.92–1.05) [0.68]	Age, height, smoking, physical activity, race	
Bhaskaran et al. (2014) Clinical Practice Research Datalink United Kingdom 1987–2012	5 243 978 Men and women Incidence	Non-Hodgkin lymphoma ICD-10: C82–C85	BMI per 5 kg/m^2 [P_{trend}]	6946	 1.03 (0.99–1.06) [0.050]	Age, diabetes, smoking, alcohol consumption, SES, calendar year, sex	
B-cell lymphoma							
Britton et al. (2008) EPIC cohort 10 European countries 1993–1998	141 425 Men Incidence	B-cell lymphoma	BMI < 25 25–29.9 ≥ 30 [P_{trend}]	 173 251 88	 1.00 0.84 (0.54–1.29) 0.89 (0.64–1.22) [0.37]	Age, study centre	No association with weight. Also examined height, hip circumference, and waist-to-hip ratio
			WC (cm) < 102 ≥ 102	 330 125	 1.00 0.98 (0.58–1.65)		

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Britton et al. (2008) (cont.)	230 558 Women Incidence	B-cell lymphoma	BMI < 25 25–29.9 ≥ 30 [P_{trend}]	 253 186 76	 1.00 0.81 (0.50–1.32) 0.72 (0.50–1.03) [0.17]		No association with weight. Also examined height, hip circumference, and waist-to-hip ratio
			WC (cm) < 88 ≥ 88	 356 133	 1.00 1.02 (0.60–1.72)		
Lu et al. (2009) California Teachers Study USA 1995–2007	121 216 Incidence	B-cell lymphoma ICD-O-3: 9590, 9591, 9670–9675, 9678–9699, 9727, 9823, 9832, 9835, 9836	BMI < 20 20–24.9 25–29.9 ≥ 30 [P_{trend}]	 52 246 154 86	 1.13 (0.84–1.53) 1.00 1.06 (0.86–1.29) 1.19 (0.93–1.52) [0.34]	Weight, height, age at menarche, physical activity	Also included results for height and physical activity
			Weight (kg) < 56.7 56.7– < 63.5 63.5– < 73.0 ≥ 73.0 [P_{trend}]	 101 114 163 161	 1.14 (0.87–1.49) 1.00 1.05 (0.83–1.34) 1.18 (0.93–1.51) [< 0.001]		
Patel et al. (2013) Cancer Prevention Study II Nutrition Cohort USA 1992–2007	152 423 Men and women Incidence	B-cell lymphoma	BMI < 18.5 18.5– < 25 25– < 30 ≥ 30 [P_{trend}]	 10 781 831 310	 0.56 (0.30–1.05) 1.00 1.08 (0.98–1.20) 1.19 (1.04–1.37) [0.002]	Age, sex, family history of haematopoietic cancer, education level, smoking status, physical activity, alcohol consumption	

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Chronic lymphocytic leukaemia/small lymphocytic lymphoma							
Ross et al. (2004) Iowa Women's Health Study USA 1986–2001	37 627 Women Incidence	CLL	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 26 40 18	 1.0 1.6 (1.0–2.6) 1.1 (0.6–2.1) [0.61]	Age, physical activity	Also included estimates for height and waist-to-hip ratio
			Weight (kg) < 63 63–73 ≥ 73 [P_{trend}]	 27 24 33	 1.0 0.8 (0.5–1.5) 1.2 (0.8–2.1) [0.33]		
			WC (cm) < 81 81–92 ≥ 92 [P_{trend}]	 26 33 25	 1.0 1.2 (0.7–2.1) 1.0 (0.6–1.7) [0.79]		
Samanic et al. (2004) United States Veterans cohort USA 1969–1996	4 500 700 Men Incidence	CLL ICD-9: 204.1	Obesity Non-obese Obese Non-obese Obese	 White men: 2918 222 Black men: 487 39	 1.00 1.30 (1.13–1.49) 1.00 1.72 (1.24–2.39)	Age, calendar year	Obesity defined as discharge diagnosis of obesity: ICD-8: 277; ICD-9: 278.0
Samanic et al. (2006) Swedish Construction Worker Cohort Sweden 1958–1999	362 552 Men Incidence	CLL ICD-7: 204.1	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 164 179 24	 1.00 1.20 (0.97–1.49) 0.98 (0.63–1.51) [0.36]	Attained age, calendar year, smoking	
Engeland et al. (2007) Norwegian cohort Norway 1963–2001	963 709 Men Incidence	CLL	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 4 869 688 99	 0.46 (0.17–1.24) 1.00 1.03 (0.93–1.14) 1.14 (0.92–1.40) [0.07]	Age, birth cohort	

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Engeland et al. (2007) (cont.)	1 038 010 Women Incidence	CLL	BMI < 18.5 18.5–24.9 25–29.9 30–34.9 35–39.9 ≥ 40 [P_{trend}]	 14 469 451 161 32 10	 1.22 (0.72–2.08) 1.00 1.12 (0.98–1.27) 1.14 (0.94–1.37) 1.05 (0.73–1.51) 1.55 (0.83–2.91) [0.1]		
Lim et al. (2007) NIH-AARP cohort USA 1995–2003	473 984 Men and women Incidence	CLL/SLL ICD-O-2: 9823, 9670	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 81 109 35 12	 1.00 0.97 (0.72–1.30) 0.87 (0.58–1.30) 0.95 (0.51–1.76) [0.60]	Age, ethnicity, education level, alcohol consumption, cigarette smoking, height, physical activity	
Larsson & Wolk (2008) Meta-analysis 1994–2007	3 cohort studies Men and women Incidence	CLL	Obesity vs normal BMI	6547	1.25 (1.11–1.41)		
Lu et al. (2009) California Teachers Study USA 1995–2007	121 216 Women Incidence	CLL/SLL	BMI < 20 20–24.9 25–29.9 ≥ 30 [P_{trend}] Weight (kg) < 56.7 56.7– < 63.5 63.5– < 73.0 ≥ 73.0 [P_{trend}]	 15 54 32 10 22 29 35 25	 1.55 (0.88–2.75) 1.00 0.97 (0.63–1.51) 0.63 (0.32–1.24) [0.06] 1.05 (0.60–1.85) 1.00 0.84 (0.51–1.38) 0.67 (0.39–1.15) [0.14]	Weight, height, age at menarche, physical activity	Also included results for height and physical activity
Pylypchuk et al. (2009) Netherlands Cohort Study on Diet and Cancer The Netherlands 1986–1999	5000 Men and women Incidence	CLL ICD-O-3: 9670, 9823	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}] per 4 kg/m^2	 1 85 72 7	 1.24 (0.77–2.01) 1.00 1.07 (0.78–1.47) 0.77 (0.35–1.69) [0.92] 0.95 (0.74–1.21)	Age, sex	Case–cohort design

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Troy et al. (2010) PLCO Trial USA 1993–2006	142 982 Men and women Incidence	CLL/SLL	BMI			Age, race/ethnicity, education level	
			< 18.5	3	–		
			18.5–24.9	110	1.00		
			25–29.9	169	1.12 (0.88–1.43)		
			≥ 30	95	1.25 (0.95–1.65)		
			[P_{trend}]		[< 0.746]		
			Weight (kg), quartiles (sex-specific)				
			Men: Women:				
			< 77.4 < 61.5	89	1.00		
			77.4–85.5 61.5–70.0	90	1.16 (0.86–1.55)		
			85.6–95.5 70.1–80.0	102	1.25 (0.94–1.67)		
			> 95.5 > 80.0	98	1.39 (1.04–1.86)		
			[P_{trend}]		[< 0.215]		
Larsson & Wolk (2011) Meta-analysis 1999–2010	6 studies Men and women Incidence	CLL/SLL	BMI per 5 kg/m^2		1.01 (0.92–1.10)		
Kabat et al. (2012) Women's Health Initiative USA 1993–2009	158 975 Women Incidence	CLL/SLL ICD-O-3: 9823, 9670	BMI			Age, smoking, alcohol consumption, education level, ethnicity, physical activity, energy intake, substudy	Also included estimates for height, hip circumference, waist-to-hip ratio, and weight/BMI at ages 18 yr, 35 yr, and 50 yr
			< 25	111	1.00		
			25– < 30	120	1.11 (0.85–1.45)		
			30– < 35	51	0.94 (0.67–1.33)		
			≥ 35	16	0.52 (0.31–0.90)		
			[P_{trend}]		[0.07]		
			Weight (kg)				
			< 62.0	81	1.00		
			62.0– < 70.4	78	0.92 (0.67–1.27)		
			70.4– < 81.6	79	0.93 (0.67–1.30)		
			≥ 81.6	60	0.72 (0.50–1.05)		
			[P_{trend}]		[0.12]		
			WC (cm)				
			< 76.1	75	1.00		
			76.1– < 84.6	81	1.10 (0.80–1.51)		
			84.6– < 95.0	81	1.13 (0.81–1.57)		
			≥ 95.0	60	0.88 (0.61–1.26)		
			[P_{trend}]		[0.57]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Bertrand et al. (2013) Nurses' Health Study and Health Professionals Follow-up Study USA 1976/1986–2008	163 184 Men and women Incidence	CLL/SLL	Adult BMI per 5 kg/m^2 [P_{trend}]	531	0.92 (0.82–1.03) [0.15]	Age, height, smoking, physical activity, race	
Health Professionals Follow-up Study	46 390 Men Incidence	CLL/SLL	Adult BMI 15–22.9 23–24.9 25–26.9 27–29.9 30–45 per 5 kg/m^2 [P_{trend}]	 45 48 59 42 13	 1.00 0.67 (0.44–1.01) 0.83 (0.56–1.24) 0.80 (0.52–1.24) 0.54 (0.28–1.02) 0.87 (0.68–1.10) [0.24]	Age, height, smoking, physical activity, race	
Nurses' Health Study	116 794 Women Incidence	CLL/SLL	Adult BMI 15–22.9 23–24.9 25–26.9 27–29.9 30–45 per 5 kg/m^2 [P_{trend}]	 118 70 53 49 34	 1.00 0.94 (0.70–1.27) 0.95 (0.69–1.32) 1.00 (0.71–1.40) 0.73 (0.49–1.07) 0.93 (0.82–1.07) [0.32]	Age, height, smoking, physical activity, race	
Patel et al. (2013) Cancer Prevention Study II Nutrition Cohort USA 1992–2007	152 423 Men and women Incidence	CLL/SLL	BMI < 18.5 18.5– < 25 25– < 30 ≥ 30 [P_{trend}]	 2 214 219 66	 0.39 (0.10–1.57) 1.00 1.05 (0.87–1.28) 0.95 (0.72–1.26) [0.86]	Age, sex, family history of haematopoietic cancer, education level, smoking status, physical activity, alcohol consumption	
Saberi Hosnijeh et al. (2013) EPIC cohort 10 European countries 1992–2010	131 724 Men Incidence	CLL	BMI < 24.22 24.22–26.30 26.31–29.72 ≥ 29.73 [P_{trend}]	 42 51 41 39	 1.00 1.12 (0.74–1.68) 0.89 (0.58–1.38) 0.87 (0.56–1.36) [0.36]	Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Saberi Hosnijeh et al. (2013) (cont.)			Weight (kg)				
			< 73.1	47	1.00		
			73.1–80.0	34	0.66 (0.42–1.03)		
			80.1–88.0	45	0.84 (0.55–1.29)		
			≥ 88.1	47	0.88 (0.56–1.38)		
			[P_{trend}]		[0.86]		
			WC (cm)				
			< 88.5	33	1.00		
			88.5–94.9	41	1.08 (0.68–1.71)		
			95–101.9	40	0.97 (0.61–1.55)		
			≥ 102	44	1.06 (0.66–1.69)		
			[P_{trend}]		[0.94]		
	242 253 Women Incidence	CLL	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 22.48	16	1.00		
			22.48–24.96	41	2.14 (1.20–3.82)		
			24.97–28.23	35	1.69 (0.93–3.07)		
			≥ 28.24	32	1.58 (0.85–2.93)		
			[P_{trend}]		[0.46]		
			Weight (kg)				
			< 58.7	21	1.00		
			58.7–65.2	31	1.19 (0.68–2.08)		
			65.3–73.9	34	1.16 (0.66–2.03)		
			≥ 74	38	1.24 (0.71–2.18)		
			[P_{trend}]		[0.51]		
			WC (cm)				
			< 73.1	27	1.00		
			73.1–79.9	25	0.88 (0.51–1.52)		
			80–88	37	1.05 (0.63–1.75)		
			≥ 88.1	29	0.84 (0.48–1.47)		
			[P_{trend}]		[0.72]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Follicular lymphoma							
Lim et al. (2007) NIH-AARP cohort USA 1995–2003	473 984 Men and women Incidence	Follicular lymphoma ICD-O-2: 9690–9693, 9695–9698	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 84 115 42 16	 1.00 1.12 (0.84–1.50) 1.14 (0.78–1.66) 1.22 (0.71–2.11) [0.38]	Age, ethnicity, education level, alcohol consumption, cigarette smoking, height, physical activity	
Britton et al. (2008) EPIC cohort 10 European countries 1993–1998	141 425 Men Incidence	Follicular lymphoma	BMI < 25 25–29.9 ≥ 30 [P_{trend}]	 16 30 7	 1.00 0.89 (0.36–2.24) 1.17 (0.63–2.18) [0.96]	Age, study centre	Also examined height, hip circumference, and waist-to-hip ratio
			Weight (kg) < 72.7 72.7–79.8 79.9–87.7 ≥ 87.8 [P_{trend}]	 12 11 17 13	 1.00 0.84 (0.36–1.94) 1.15 (0.52–2.52) 0.82 (0.34–1.98) [0.85]		
			WC (cm) < 102 ≥ 102	 37 10	 1.00 0.76 (0.30–1.95)		
	230 558 Women Incidence	Follicular lymphoma	BMI < 25 25–29.9 ≥ 30 [P_{trend}]	 40 28 10	 1.00 0.68 (0.33–1.40) 0.89 (0.54–1.46) [0.30]	Age, study centre	Also examined height, hip circumference, and waist-to-hip ratio
			Weight (kg) < 72.7 72.7–79.8 79.9–87.7 ≥ 87.8 [P_{trend}]	 16 25 15 22	 1.00 1.33 (0.70–2.52) 0.69 (0.33–1.43) 0.98 (0.49–1.98) [0.49]		
			WC (cm) < 88 ≥ 88	 56 21	 1.00 1.07 (0.52–2.20)		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Maskarinec et al. (2008) Multiethnic Cohort USA 1993–2002	87 079 Men Incidence	Follicular lymphoma ICD-O-3: 9690, 9691, 9695, 9698	BMI < 22.5 22.5–24.9 25.0–29.9 ≥ 30.0 [P_{trend}]	 4 18 23 6	 0.18 (0.03–1.07) 1.00 0.99 (0.30–3.23) 1.86 (0.44–7.86) [0.09]	Age, ethnicity, education level, alcohol consumption	
			Weight (lb) < 152.0 152.0–170.0 170.1–192.0 > 192.0 [P_{trend}]	 14 11 13 13	 1.00 1.92 (0.51–7.31) 0.99 (0.26–3.83) 3.20 (0.74–13.84) [0.18]		
	105 972 Women Incidence	Follicular lymphoma ICD-O-3: 9690, 9691, 9695, 9698	BMI < 22.5 22.5–24.9 25.0–29.9 ≥ 30.0 [P_{trend}]	 26 16 23 11	 1.63 (0.67–3.98) 1.00 1.45 (0.62–3.41) 6.16 (1.75–21.71) [0.20]	Age, ethnicity, education level, alcohol consumption, age at first birth	
			Weight (lb) < 125.0 125.0–143.0 143.1–167.0 > 167.0 [P_{trend}]	 21 21 17 18	 1.00 0.35 (0.12–0.97) 0.40 (0.15–1.06) 0.57 (0.18–1.75) [0.54]		
Lu et al. (2009) California Teachers Study USA 1995–2007	121 216 Women Incidence	Follicular lymphoma	BMI < 20 20–24.9 25–29.9 ≥ 30 [P_{trend}]	 9 50 35 19	 0.94 (0.46–1.92) 1.00 1.23 (0.80–1.90) 1.29 (0.77–2.19) [0.26]	Weight, height, age at menarche, physical activity	Also included results for height and physical activity
			Weight (kg) < 56.7 56.7– < 63.5 63.5– < 73.0 ≥ 73.0 [P_{trend}]	 16 24 34 40	 0.86 (0.45–1.65) 1.00 1.07 (0.63–1.81) 1.41 (0.84–2.37) [0.09]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Pylypchuk et al. (2009) Netherlands Cohort Study on Diet and Cancer The Netherlands 1986–1999	5000 Men and women Incidence	Follicular lymphoma ICD-O-3: 9690–9698	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}] per 4 kg/m^2	 3 38 33 3	 4.92 (1.45–16.66) 1.00 1.16 (0.72–1.85) 0.61 (0.18–2.01) [0.45] 0.81 (0.59–1.12)	Age, sex	Case–cohort design
Troy et al. (2010) PLCO Trial USA 1993–2006	142 982 Men and women Incidence	Follicular lymphoma	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 49 76 36	 1.00 1.14 (0.79–1.65) 1.03 (0.67–1.60) [0.465]	Age, race/ethnicity, education level	
			Weight (kg), quartiles (sex-specific)				
			Men: / Women: < 77.4 / < 61.5 77.4–85.5 / 61.5–70.0 85.6–95.5 / 70.1–80.0 > 95.5 / > 80.0 [P_{trend}]	 37 44 45 36	 1.00 1.32 (0.85–2.04) 1.27 (0.82–1.97) 1.14 (0.72–1.82) [0.555]		
Larsson & Wolk (2011) Meta-analysis 1999–2010	6 studies Men and women Incidence	Follicular lymphoma	BMI per 5 kg/m^2		 1.03 (0.93–1.13)		
Kabat et al. (2012) Women's Health Initiative USA 1993–2009	158 975 Women Incidence	Follicular lymphoma ICD-O-3: 9690–9698	BMI < 25 25– < 30 30– < 35 ≥ 35 [P_{trend}]	 72 80 44 18	 1.00 1.11 (0.80–1.54) 1.29 (0.87–1.91) 0.97 (0.57–1.66) [0.56]	Age, smoking, alcohol consumption, education level, ethnicity, physical activity, energy intake, substudy	Also included estimates for height, hip circumference, waist-to-hip ratio, and weight/BMI at ages 18 yr, 35 yr, and 50 yr
			Weight (kg) < 62.0 62.0– < 70.4 70.4– < 81.6 ≥ 81.6 [P_{trend}]	 57 54 57 46	 1.00 0.84 (0.57–1.24) 0.97 (0.66–1.43) 0.88 (0.57–1.34) [0.72]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Kabat et al. (2012) (cont.)			WC (cm) < 76.1 76.1– < 84.6 84.6– < 95.0 ≥ 95.0 [P_{trend}]	 62 52 50 50	 1.00 0.80 (0.54–1.16) 0.87 (0.60–1.27) 0.87 (0.58–1.29) [0.57]		
Bertrand et al. (2013) Nurses' Health Study and Health Professionals Follow-up Study USA 1976/1986–2008	163 184 Men and women Incidence	Follicular lymphoma	Adult BMI per 5 kg/m^2 [P_{trend}]	 291	 1.07 (0.93–1.24) [0.35]	Age, height, smoking, physical activity, race	
Health Professionals Follow-up Study	46 390 Men Incidence	Follicular lymphoma	Adult BMI 15–22.9 23–24.9 25–26.9 27–29.9 30–45 per 5 kg/m^2 [P_{trend}]	 10 25 14 15 8	 1.00 1.45 (0.69–3.05) 0.87 (0.38–1.98) 1.28 (0.57–2.88) 1.65 (0.64–4.27) 1.14 (0.78–1.66) [0.49]	Age, height, smoking, physical activity, race	
Nurses' Health Study	116 794 Women Incidence	Follicular lymphoma	Adult BMI 15–22.9 23–24.9 25–26.9 27–29.9 30–45 per 5 kg/m^2 [P_{trend}]	 78 48 29 28 36	 1.00 1.02 (0.71–1.46) 0.84 (0.55–1.29) 0.91 (0.59–1.41) 1.34 (0.89–2.01) 1.06 (0.91–1.24) [0.46]	Age, height, smoking, physical activity, race	
Patel et al. (2013) Cancer Prevention Study II Nutrition Cohort USA 1992–2007	152 423 Men and women Incidence	Follicular lymphoma	BMI < 18.5 18.5– < 25 25– < 30 ≥ 30 [P_{trend}]	 3 123 118 48	 1.04 (0.33–3.29) 1.00 1.02 (0.78–1.32) 1.16 (0.82–1.63) [0.46]	Age, sex, family history of haematopoietic cancer, education level, smoking status, physical activity, alcohol consumption	

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
T-cell non-Hodgkin lymphoma							
Lukanova et al. (2006) Northern Sweden Health and Disease Cohort Sweden 1985–2003	33 424 Men Incidence	T-cell NHL	BMI 18.5–23.4 23.5–25.3 25.4–27.6 ≥ 27.1 [P_{trend}]	 10 15 14 15	 1.00 1.29 (0.59–2.98) 1.07 (0.48–2.49) 1.11 (0.50–2.56) [0.97]	Age, calendar year, smoking	
Northern Sweden Health and Disease Cohort	35 362 Women Incidence	T-cell NHL	BMI 18.5–22.8 22.9–25.9 ≥ 26 [P_{trend}]	 6 17 12	 1.00 2.20 (0.91–6.12) 1.29 (0.49–3.75) [0.95]	Age, calendar year, smoking	
Lim et al. (2007) NIH-AARP cohort USA 1995–2003	473 984 Men and women Incidence	T-cell lymphoma ICD-O-2: 9700–9709, 9713–9714, 9716–9717, 9800–9801, 9827	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 27 28 16	 1.00 0.86 (0.50–1.48) 1.11 (0.59–2.11) [0.60]	Age, ethnicity, education level, alcohol consumption, cigarette smoking, height, physical activity	
Patel et al. (2013) Cancer Prevention Study II Nutrition Cohort USA 1992–2007	152 423 Men and women Incidence	T-cell lymphoma	BMI 18.5– < 25 25– < 30 ≥ 30 [P_{trend}]	 38 52 24	 1.00 1.35 (0.88–2.07) 1.82 (1.08–3.08) [0.013]	Age, sex, family history of haematopoietic cancer, education level, smoking status, physical activity, alcohol consumption	
Myeloid leukaemia							
Ross et al. (2004) Iowa Women's Health Study USA 1986–2001	37 627 Women Incidence	Acute myeloid leukaemia	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 16 30 26	 1.0 1.9 (1.0–3.4) 2.4 (1.3–4.5) [0.006]	Age, physical activity	Study in post-menopausal women Also included estimates for height and waist-to-hip ratio

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Ross et al. (2004) (cont.)			Weight (kg)				
			< 63	13	1.0		
			63–73	26	1.8 (0.9–3.6)		
			≥ 73	33	2.3 (1.2–4.4)		
			[P_{trend}]		[0.01]		
			WC (cm)				
			< 81	20	1.0		
			81–92	16	0.8 (0.4–1.5)		
			≥ 92	36	1.6 (0.9–2.8)		
			[P_{trend}]		[0.04]		
Samanic et al. (2004) United States Veterans cohort USA 1969–1996	4 500 700 Men Incidence	Acute myeloid leukaemia ICD-9: 205.0	Obesity			Age, calendar year	Obesity defined as discharge diagnosis of obesity: ICD-8: 277; ICD-9: 278.0
				White men:			
			Non-obese	1469	1.00		
			Obese	138	1.59 (1.33–1.90)		
				Black men:			
			Non-obese	257	1.00		
			Obese	30	2.64 (1.80–3.85)		
		Chronic myeloid leukaemia ICD-9: 205.1	Obesity			Age, calendar year	Obesity defined as discharge diagnosis of obesity: ICD-8: 277; ICD-9: 278.0
				White men:			
			Non-obese	1186	1.00		
			Obese	77	1.15 (0.92–1.45)		
				Black men:			
			Non-obese	239	1.00		
			Obese	14	1.32 (0.77–2.27)		
Samanic et al. (2006) Swedish Construction Worker Cohort Sweden 1958–1999	362 552 Men Mortality	Acute myeloid leukaemia ICD-7: 205.0	BMI			Attained age, calendar year, smoking	
			18.5–24.9	149	1.00		
			25–29.9	96	0.84 (0.64–1.09)		
			≥ 30	22	1.19 (0.76–1.88)		
			[P_{trend}]		[> 0.5]		
	362 552 Men Incidence	Chronic myeloid leukaemia ICD-7: 205.1	BMI				
			18.5–24.9	63	0.58 (0.36–0.94)		
			25–29.9	25	1.35 (0.66–2.74)		
			≥ 30	9	[> 0.5]		
			[P_{trend}]				

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Engeland et al. (2007) Norwegian cohort Norway 1963–2001	963 709 Men Incidence	Acute myeloid leukaemia	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 7 708 581 78	 0.95 (0.45–2.00) 1.00 1.10 (0.98–1.23) 1.12 (0.89–1.42) [0.04]	Age, birth cohort	
	1 038 010 Women Incidence	Acute myeloid leukaemia	BMI < 18.5 18.5–24.9 25–29.9 30–34.9 35–39.9 ≥ 40 [P_{trend}]	 16 555 458 172 30 9	 1.00 (0.60–1.64) 1.00 1.11 (0.97–1.26) 1.21 (1.01–1.44) 0.96 (0.66–1.39) 1.31 (0.68–2.54) [0.01]		
	963 709 Men Incidence	Chronic myeloid leukaemia	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 2 245 207 40	 0.78 (0.19–3.15) 1.00 1.13 (0.93–1.36) 1.65 (1.18–2.31) [0.009]	Age, birth cohort	
	1 038 010 Women Incidence	Chronic myeloid leukaemia	BMI < 18.5 18.5–24.9 25–29.9 30–34.9 35–39.9 ≥ 40 [P_{trend}]	 4 164 186 47 14 4	 0.85 (0.31–2.29) 1.00 1.46 (1.17–1.82) 1.06 (0.76–1.48) 1.43 (0.83–2.49) 1.89 (0.70–5.10) [0.02]		
Fernberg et al. (2007) Swedish construction workers Sweden 1971–2004	336 381 Men Incidence	Acute myeloid leukaemia	BMI 18.5–24.9 25–29.9 ≥ 30	 112 94 18	 1.00 1.07 (0.80–1.42) 1.30 (0.77–2.17)	Attained age, snuff use, daily tobacco smoking	
		Chronic myeloid leukaemia	BMI 18.5–24.9 25–29.9 ≥ 30	 66 27 8	 1.00 0.69 (0.43–1.09) 1.35 (0.64–2.84)		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Fujino et al. (2007) Japan Collaborative Cohort Study Japan NR	NR Men Mortality	Myeloid leukaemia	BMI < 18.5 18.5–24 25–29 ≥ 30	 1 33 7 3	 0.37 (0.05–2.75) 1.00 1.03 (0.45–2.35) 7.55 (2.30–24.76)	Age, area of study	No information provided on follow-up or number of people in study
			Weight (kg) < 55 55–62 ≥ 63	 10 18 16	 1.00 1.50 (0.68–3.29) 1.49 (0.65–3.40)		
	NR Women Mortality	Myeloid leukaemia	BMI < 18.5 18.5–24 25–29 ≥ 30	 1 20 6 3	 0.49 (0.06–3.70) 1.00 0.98 (0.39–2.45) 4.66 (1.36–16.0)		
			Weight (kg) < 47 47–54 ≥ 55	 12 6 13	 1.00 0.62 (0.23–1.69) 1.15 (0.51–2.60)		
Larsson & Wolk (2008) Meta-analysis 1994–2007	4 cohort studies Men and women Incidence	Acute myeloid leukaemia	Obesity vs normal BMI	4804 total	1.52 (1.19–1.95)		
	3 cohort studies Men and women Incidence	Chronic myeloid leukaemia	Obesity vs normal BMI	2530 total	1.26 (1.09–1.46)		
Kabat et al. (2013) NIH-AARP cohort USA 1995–2006	493 188 Men and women Incidence	Chronic myeloid leukaemia	BMI < 25 25– < 30 ≥ 30	 45 85 46	 1.00 1.31 (0.90–1.90) 1.46 (0.95–2.23)	Age, education level, smoking, physical activity, sex	
Saberi Hosnijeh et al. (2013) EPIC cohort 10 European countries 1992–2010	131 724 Men Incidence	Myeloid leukaemia	BMI < 24.22 24.22–26.30 26.31–29.72 ≥ 29.73 [P_{trend}]	 33 38 37 34	 1.00 1.08 (0.68–1.72) 1.05 (0.65–1.68) 1.00 (0.61–1.63) [0.95]	Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Saberi Hosnijeh et al. (2013) (cont.)			Weight (kg)				
			< 73.1	32	1.00		
			73.1–80.0	35	1.10 (0.67–1.80)		
			80.1–88.0	36	1.13 (0.68–1.86)		
			≥ 88.1	39	1.24 (0.74–2.08)		
			[P_{trend}]		[0.43]		
			WC (cm)				
			< 88.5	24	1.00		
			88.5–94.9	35	1.34 (0.80–2.26)		
			95–101.9	36	1.30 (0.77–2.20)		
			≥ 102	37	1.35 (0.79–2.30)		
			[P_{trend}]		[0.35]		
	242 253 Women Incidence	Myeloid leukaemia	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 22.48	20	1.00		
			22.48–24.96	30	1.27 (0.72–2.23)		
			24.97–28.23	48	1.86 (1.09–3.15)		
			≥ 28.24	41	1.63 (0.94–2.83)		
			[P_{trend}]		[0.04]		
			Weight (kg)				
			< 58.7	27	1.00		
			58.7–65.2	28	0.91 (0.54–1.56)		
			65.3–73.9	37	1.13 (0.68–1.88)		
			≥ 74	47	1.41 (0.86–2.33)		
			[P_{trend}]		[0.1]		
			WC (cm)				
			< 73.1	27	1.00		
			73.1–79.9	28	1.09 (0.64–1.85)		
			80–88	29	0.96 (0.56–1.64)		
			≥ 88.1	50	1.79 (1.09–2.94)		
			[P_{trend}]		[0.03]		
	131 724 Men Incidence	Acute myeloid leukaemia	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 24.22	16	1.00		
			24.22–26.30	41	0.96 (0.49–1.86)		
			26.31–29.72	35	1.24 (0.66–2.33)		
			≥ 29.73	32	0.79 (0.39–1.62)		
			[P_{trend}]		[0.75]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Saberi Hosnijeh et al. (2013) (cont.)			Weight (kg)				
			< 73.1	14	1.00		
			73.1–80.0	19	1.20 (0.59–2.43)		
			80.1–88.0	22	1.28 (0.63–2.61)		
			≥ 88.1	19	1.05 (0.49–2.24)		
			[P_{trend}]		[0.92]		
			WC (cm)				
			< 88.5	12	1.00		
			88.5–94.9	15	1.03 (0.48–2.21)		
			95–101.9	20	1.23 (0.59–2.55)		
			≥ 102	21	1.25 (0.60–2.61)		
			[P_{trend}]		[0.47]		
	242 253 Women Incidence	Acute myeloid leukaemia	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 22.48	10	1.00		
			22.48–24.96	17	1.38 (0.63–3.02)		
			24.97–28.23	30	2.17 (1.05–4.48)		
			≥ 28.24	17	1.26 (0.56–2.81)		
			[P_{trend}]		[0.40]		
			Weight (kg)				
			< 58.7	16	1.00		
			58.7–65.2	15	0.82 (0.40–1.68)		
			65.3–73.9	20	1.02 (0.52–2.01)		
			≥ 74	23	1.17 (0.59–2.30)		
			[P_{trend}]		[0.49]		
			WC (cm)				
			< 73.1	13	1.00		
			73.1–79.9	15	1.20 (0.57–2.53)		
			80–88	19	1.30 (0.63–2.66)		
			≥ 88.1	26	1.93 (0.96–3.89)		
			[P_{trend}]		[0.06]		
	131 724 Men Incidence	Chronic myeloid leukaemia	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 24.22	8	1.00		
			24.22–26.30	10	1.16 (0.46–2.96)		
			26.31–29.72	5	0.59 (0.19–1.81)		
			≥ 29.73	9	1.10 (0.41–2.94)		
			[P_{trend}]		[0.84]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Saberi Hosnijeh et al. (2013) (cont.)			Weight (kg)				
			< 73.1	12	1.00		
			73.1–80.0	5	0.50 (0.17–1.44)		
			80.1–88.0	5	0.53 (0.17–1.58)		
			≥ 88.1	10	1.12 (0.42–3.00)		
			[P_{trend}]		[0.88]		
			WC (cm)				
			< 88.5	7	1.00		
			88.5–94.9	8	1.14 (0.41–3.16)		
			95–101.9	8	1.14 (0.40–3.21)		
			≥ 102	7	1.05 (0.35–3.13)		
			[P_{trend}]		[0.93]		
	242 253 Women Incidence	Chronic myeloid leukaemia	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 22.48	7	1.00		
			22.48–24.96	6	0.75 (0.25–2.24)		
			24.97–28.23	11	1.28 (0.49–3.36)		
			≥ 28.24	10	1.17 (0.42–3.23)		
			[P_{trend}]		[0.53]		
			Weight (kg)				
			< 58.7	8	1.00		
			58.7–65.2	7	0.72 (0.26–2.00)		
			65.3–73.9	10	0.92 (0.35–2.43)		
			≥ 74	9	0.80 (0.29–2.19)		
			[P_{trend}]		[0.82]		
			WC (cm)				
			< 73.1	10	1.00		
			73.1–79.9	9	0.87 (0.35–2.16)		
			80–88	3	0.23 (0.06–0.85)		
			≥ 88.1	8	0.57 (0.20–1.61)		
			[P_{trend}]		[0.11]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Leukaemia not otherwise specified							
Calle et al. (2003) Cancer Prevention Study II USA 1982–1998	404 576 Men Mortality	Leukaemia	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 546 720 128 20	 1.00 1.14 (1.02–1.28) 1.37 (1.13–1.67) 1.70 (1.08–2.66) [< 0.001]	Age, race, education level, smoking, physical activity, alcohol consumption, marital status, aspirin use, fat and vegetable consumption	
	495 477 Women Mortality	Leukaemia	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 574 282 83 18	 1.00 1.05 (0.91–1.21) 1.12 (0.89–1.42) 0.93 (0.58–1.49) [0.53]		
Ross et al. (2004) Iowa Women's Health Study USA 1986–2001	37 627 Women Incidence	Leukaemia	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 54 85 55	 1.0 1.6 (1.1–2.3) 1.6 (1.1–2.4) [0.10]	Age, physical activity	Also included estimates for height and waist-to-hip ratio
			Weight (kg) < 63 63–73 ≥ 73 [P_{trend}]	 49 65 80	 1.0 1.2 (0.9–1.8) 1.6 (1.1–2.3) [0.007]		
			WC (cm) < 81 81–92 ≥ 92 [P_{trend}]	 53 67 74	 1.0 1.2 (0.9–1.8) 1.4 (1.0–1.9) [0.58]		
Samanic et al. (2004) United States Veterans cohort USA 1969–1996	4 500 700 (3 668 486 White; 832 214 Black) Men Incidence	Leukaemia ICD-9: 204–208	Obesity Non-obese Obese Non-obese Obese	 White men: 7687 630 Black men: 1364 109	 1.00 1.42 (1.31–1.54) 1.00 1.77 (1.45–2.15)	Age, calendar year	Obesity defined as discharge diagnosis of obesity: ICD-8: 277; ICD-9: 278.0

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Oh et al. (2005) Korea National Health Insurance Corporation Republic of Korea 1992–2001	781 283 Men Incidence	Leukaemia	BMI < 18.5 18.5–22.9 23–24.9 25–26.9 27–29.9 ≥ 30 [P_{trend}]	 2 86 67 32 10 3	 0.64 (0.16–2.61) 1.00 1.25 (0.90–1.75) 1.01 (0.66–1.55) 0.75 (0.38–1.51) 2.03 (0.64–6.44) [0.683]	Age, smoking, alcohol consumption, physical activity, family history of cancer, urban/rural residence	
Chiu et al. (2006) Chicago Heart Association Detection Project in Industry USA 1967–2002	20 313 Men Mortality	Leukaemia	BMI < 24.12 24.13–26.3 26.31–28.61 ≥ 28.62 [P_{trend}]	 15 23 35 31	 1.00 1.41 (0.74–2.71) 2.07 (1.13–3.80) 1.90 (1.02–3.53) [0.03]	Age, race, smoking	
	15 106 Women Mortality	Leukaemia	BMI < 20.99 20.99–23.24 23.25–26.15 ≥ 26.16 [P_{trend}]	 6 7 13 21	 1.0 1.07 (0.36–3.18) 1.81 (0.68–4.82) 2.83 (1.11–7.02) [< 0.01]		
Samanic et al. (2006) Swedish Construction Worker Cohort Sweden 1958–1999	362 552 Men Incidence	Leukaemia ICD-7: 204–207	BMI 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 399 310 58	 1.00 0.97 (0.83–1.13) 1.12 (0.85–1.48) [> 0.5]	Attained age, calendar year, smoking	
Reeves et al. (2007) Million Women Study United Kingdom 1996–2005	1 222 630 Women Incidence	Leukaemia ICD-10: C91–C95	BMI < 22.5 22.5–24.9 25–27.4 27.5–29.9 ≥ 30 per 10 kg/m^2	 91 169 137 99 139	 0.71 (0.57–0.87) 1.00 (0.86–1.16) 0.97 (0.82–1.14) 1.14 (0.93–1.38) 1.25 (1.05–1.48) 1.50 (1.23–1.83)	Age, geographical region, SES, reproductive history, smoking status, alcohol consumption, physical activity	

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Reeves et al. (2007) (cont.)	1 222 630 Women Mortality	Leukaemia ICD-10: C91–C95	BMI < 22.5 22.5–24.9 25–27.4 27.5–29.9 ≥ 30 per 10 kg/m^2	 67 109 93 65 94	 0.82 (0.64–1.04) 1.00 (0.83–1.21) 0.99 (0.81–1.21) 1.09 (0.86–1.39) 1.21 (0.98–1.49) 1.34 (1.05–1.71)		
Larsson & Wolk (2008) Meta-analysis 1994–2007	10 cohort studies Men and women Incidence	Leukaemia	BMI (variable cut-off points) Normal Overweight Obese	17 349 total	 1.00 1.14 (1.03–1.25) 1.39 (1.25–1.54)		
Renehan et al. (2008) Meta-analysis 1966–2007	7 studies Men Incidence	Leukaemia	BMI per 5 kg/m^2	NR	 1.08 (1.02–1.14)		Also split up by global region
	7 studies Women Incidence	Leukaemia	BMI per 5 kg/m^2	NR	 1.17 (1.04–1.32)		Also split up by global region
Song et al. (2008) Korea Medical Insurance Corporation Republic of Korea 1994–2003	170 481 Women Incidence	Leukaemia ICD-10: C91–C95	BMI < 18.5 18.5–20.9 21–22.9 23.0–24.9 25.0–26.9 27.0–29.9 ≥ 30.0 per 1 kg/m^2	 4 12 10 22 17 18 10	 3.21 (1.00–10.3) 1.40 (0.55–3.55) 1.00 1.64 (0.77–3.50) 1.61 (0.73–3.55) 1.77 (0.76–4.10) 5.15 (2.09–12.7) 1.09 (1.02–1.16)	Age, height, smoking status, alcohol consumption, exercise, income	
Whitlock et al. (2009) 57 pooled European and American cohorts Follow-up varied by cohort	894 576 Men and women Mortality	Leukaemia ICD-9: 204–208	BMI, per 5 kg/m^2 For BMI 15–24.9 For BMI 25–50 For BMI 15–50	 290 315	 1.02 (0.69–1.50) 0.88 (0.68–1.14) 1.01 (0.89–1.16)	Study, sex, age, smoking	

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Andreotti et al. (2010) Agricultural Health Study USA 1993–2005	39 628 Men Incidence	Leukaemia	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 Continuous variable	 23 52 17 2	 1.00 1.21 (0.64–2.30) 1.38 (0.64–2.97) – 1.00 (0.94–1.07)	Race, smoking status, vegetable consumption, exercise, family history of cancer, age	
	28 319 Women Incidence	Leukaemia	BMI 18.5–24.9 25–29.9 30–34.9 ≥ 35 Continuous variable	 13 10 2 1	 1.00 0.93 (0.39–2.20) – – 0.93 (0.84–1.02)	Smoking status, hypertension, use of vitamin supplements, parity	
De Roos et al. (2010) Women's Health Initiative USA 1994-2008	81 219 Women Incidence	Leukaemia	BMI < 25 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 72 55 25 22	 1.00 0.93 (0.65–1.32) 0.96 (0.61–1.52) 1.52 (0.93–2.47) [0.37]	Age, minority race, education level, region of the USA, smoking	
Parr et al. (2010) Asia-Pacific Cohort Studies Collaboration 1961–1999 10 countries Average follow-up 4 yr	326 387 Men and women Mortality	Leukaemia ICD-9: 204–208 ICD-10: C91–C95	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 per 5 kg/m^2 [P_{trend}]	 4 52 32 67 29	 0.82 (0.29–2.26) 1.00 (0.81–1.23) 1.14 (0.89–1.47) 1.65 (1.10–2.47) 1.27 (1.05–1.54) [0.047]	Age, sex, smoking	
Chu et al. (2011) MJ Health Screening Center Taiwan, China 1997–2007	383 956 Men and women Mortality	Leukaemia	BMI < 18.5 18.5–23.9 24–26.9 ≥ 27 [P_{trend}]	 7 30 21 15	 2.01 (0.80–5.04) 1.00 1.16 (0.61–2.20) 2.07 (1.08–3.96) [0.20]	Sex, age, smoking, alcohol consumption, physical activity	
			WC (cm)				
			Men: Women: < 90 < 80 ≥ 90 ≥ 80	 45 27	 1.00 1.87 (1.27–2.75)		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Saberi Hosnijeh et al. (2013) EPIC cohort 10 European countries 1992–2010	131 724 Men Incidence	Leukaemia	BMI			Age, study country, height	Also included height, hip circumference, and waist-to-hip ratio
			< 24.22	88	1.00		
			24.22–26.30	94	0.99 (0.74–1.32)		
			26.31–29.72	94	0.98 (0.73–1.31)		
			≥ 29.73	83	0.89 (0.65–1.21)		
			[P_{trend}]		[0.46]		
			Weight (kg)				
			< 73.1	93	1.00		
			73.1–80.0	75	0.76 (0.56–1.04)		
			80.1–88.0	92	0.92 (0.68–1.25)		
			≥ 88.1	99	1.01 (0.74–1.38)		
			[P_{trend}]		[0.66]		
			WC (cm)				
			< 88.5	66	1.00		
			88.5–94.9	84	1.15 (0.83–1.59)		
			95–101.9	91	1.16 (0.84–1.60)		
			≥ 102	92	1.17 (0.84–1.62)		
			[P_{trend}]		[0.39]		
	242 253 Women Incidence	Leukaemia	BMI				Also included height, hip circumference, and waist-to-hip ratio
			< 22.48	42	1.00		
			22.48–24.96	84	1.68 (1.16–2.43)		
			24.97–28.23	96	1.75 (1.21–2.53)		
			≥ 28.24	79	1.46 (0.99–2.14)		
			[P_{trend}]		[0.12]		
			Weight (kg)				
			< 58.7	58	1.00		
			58.7–65.2	66	0.96 (0.67–1.37)		
			65.3–73.9	84	1.11 (0.79–1.57)		
			≥ 74	93	1.19 (0.84–1.69)		
			[P_{trend}]		[0.2]		
			WC (cm)				
			< 73.1	63	1.00		
			73.1–79.9	62	0.98 (0.69–1.40)		
			80–88	78	1.02 (0.73–1.44)		
			≥ 88.1	84	1.14 (0.80–1.61)		
			[P_{trend}]		[0.43]		

Table 2.2.20a Cohort studies of measures of body fatness and haematopoietic malignancies with *inadequate* evidence

Reference Cohort Location Follow-up period	Total number of subjects Sex Incidence/mortality	Organ site (ICD code)	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Bhaskaran et al. (2014) Clinical Practice Research Datalink United Kingdom 1987–2012	5 243 978 Men and women Incidence	Leukaemia ICD-10: C91–C95	BMI per 5 kg/m^2 [P_{trend}]	5833	 1.09 (1.05–1.13) [< 0.0001]	Age, diabetes, smoking, alcohol consumption, SES, calendar year, sex	
Batty et al. (2015) Whitehall Study United Kingdom 1967–2002	18 403 Men Mortality	Leukaemia	BMI 18.5–24.9 25.0–29.9 ≥ 30 [P_{trend}]	 61 45 2	 1.00 0.93 (0.61–1.41) 0.44 (0.10–1.91) [0.42]	Age, employment grade, physical activity, smoking status, marital status, prevalent disease, past-year weight loss, BP medication, height, skinfold thickness, systolic BP, plasma cholesterol, glucose intolerance, diabetes	

BMI, body mass index (in kg/m^2); BP, blood pressure; CI, confidence interval; CLL, chronic lymphocytic leukaemia; EPIC, European Prospective Investigation into Cancer and Nutrition; ICD, International Classification of Diseases; ICD-O, International Classification of Diseases for Oncology; NHL, non-Hodgkin lymphoma; NIH-AARP, National Institutes of Health–AARP Diet and Health Study; NR, not reported; PLCO, Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial; SES, socioeconomic status; SLL, small lymphocytic lymphoma; WC, waist circumference; yr, year or years

Table 2.2.20b Case–control studies of measures of body fatness and haematological malignancies with *inadequate* evidence

Reference Study location Period	Total number of cases Total number of controls Source of controls	Exposure categories	Exposed cases	Relative risk (95% CI)	Adjustment for confounding
Hodgkin lymphoma					
Chang et al. (2005) Scandinavia 1999–2002	618 from Scandinavian Lymphoma Etiology Study 3187 (for entire study) Population	BMI			Age, sex, country
		Age < 45 yr:			
		< 18.5	6	0.9 (0.3–2.8)	
		18.5–24.9	287	1.0	
		25–29.9	90	0.9 (0.7–1.3)	
		≥ 30	26	1.1 (0.6–1.9)	
		Age ≥ 45 yr:			
		< 18.5	0	–	
		18.5–24.9	95	1.0	
		25–29.9	91	1.1 (0.8–1.5)	
		≥ 30	19	0.8 (0.5–1.3)	
Willett & Roman (2006) United Kingdom 1998–2003	216 216 Population	BMI			
		All:			
		< 18.5	6	0.9 (0.3–2.6)	
		18.5–24.9	113	1.0	
		25–29.9	67	1.1 (0.7–1.7)	
		≥ 30	30	2.2 (1.1–4.3)	
		Men:			
		18.5–24.9	60	1.0	
		25–29.9	51	1.1 (0.7–1.8)	
		≥ 30	23	2.8 (1.2–6.5)	
		Women:			
		< 18.5	5	0.7 (0.2–2.4)	
		18.5–24.9	53	1.0	
		25–29.9	16	1.3 (0.5–3.0)	
		≥ 30	7	1.1 (0.3–3.8)	
Li et al. (2013) USA (Connecticut and Massachusetts) 1997–2000	567 679 Population-matched controls from Connecticut and Massachusetts	BMI			Age, sex, state of residence, race, education level, smoking history
		Men, age < 35 yr:			
		18.5– < 25	70	1.0	
		25– < 30	52	0.8 (0.5–1.3)	
		≥ 30	25	1.4 (0.7–3.0)	

Table 2.2.20b Case–control studies of measures of body fatness and haematological malignancies with *inadequate* evidence

Reference Study location Period	Total number of cases Total number of controls Source of controls	Exposure categories	Exposed cases	Relative risk (95% CI)	Adjustment for confounding
Li et al. (2013) (cont.)		Men, age ≥ 35 yr:			
		18.5– < 25	42	1.0	
		25– < 30	62	0.7 (0.4–1.3)	
		≥ 30	30	0.9 (0.5–1.8)	
		Women, age < 35 yr:			
		18.5– < 25	74	1.0	
		25– < 30	31	2.1 (1.1–4.0)	
		≥ 30	14	0.9 (0.4–1.9)	
		Women, age ≥ 35 yr:			
		18.5– < 25	77	1.0	
		25– < 30	32	0.6 (0.4–1.2)	
		≥ 30	21	0.4 (0.2–0.8)	
Non-Hodgkin lymphoma					
Larsson & Wolk (2007) Meta-analysis 1999–2006	16 studies (10 cohort and 6 case–control) Case–control studies: 8561 cases 14 254 controls Population for 5 studies and hospital for 1 study	BMI			
		All studies:			
		< 25		1.00	
		25– < 30		1.07 (1.01–1.14)	
		≥ 30		1.20 (1.07–1.34)	
		Case–control studies:			
		< 25		1.00	
		25– < 30		1.09 (0.95–1.25)	
		≥ 30		1.22 (1.00–1.50)	
Willett et al. (2008) Pooled analysis from InterLymph Consortium of 18 case–control studies Europe, Japan, North America 1983–2004	10 000 16 000	BMI			
		< 18.5	24	0.85 (0.50–1.44)	
		18.5–24.9	802	1.00	
		25–29	776	0.79 (0.69–0.90)	
		30–39.9	403	0.84 (0.72–0.99)	
		≥ 40	31	0.63 (0.40–0.99)	
		[P_{trend}]		[0.12]	

Table 2.2.20b Case–control studies of measures of body fatness and haematological malignancies with *inadequate* evidence

Reference Study location Period	Total number of cases Total number of controls Source of controls	Exposure categories	Exposed cases	Relative risk (95% CI)	Adjustment for confounding
Chronic lymphocytic leukaemia/small lymphocytic lymphoma					
Chang et al. (2005) Denmark, Sweden 1999–2002	750 from Scandinavian Lymphoma Etiology Study 3158 Population	BMI < 18.5 18.5–24.9 25–29.9 30–34.9 ≥ 35 [P_{trend}]	 11 370 286 72 11	 1.1 (0.6–2.3) 1.0 0.8 (1.0–1.4) [sic] 0.9 (0.7–1.2) 0.6 (0.3–1.2) [0.04]	Age, sex, country
Pan et al. (2005) Canada 1994–1997	100 from National Enhanced Cancer Surveillance System 3106 Population	BMI 18.5– < 25 25– < 30 ≥ 30 [P_{trend}]	 35 48 13	 1.00 1.64 (1.04–2.59) 1.27 (0.66–2.44) [0.18]	Age, province, sex, education level, pack-years of smoking, alcohol consumption, exposure to some chemicals, occupational exposures, physical activity, energy intake
Morton et al. (2008) SEER registries, USA	128 1057 Population	BMI < 25 25– < 35 ≥ 35 [P_{trend}]	 50 66 12	 1.0 0.6 (0.4–0.9) 0.7 (0.4–1.4) [0.06]	
Chen et al. (2011) USA 1996–2000	59 868 Population	BMI < 25 25–30 > 30 [P_{trend}]	 32 18 9	 1.0 1.1 (0.6–2.1) 0.9 (0.4–2.0) [0.635]	Age, race, total energy intake
Kelly et al. (2012) USA 2002–2008	302 from Mayo Clinic 1315 Population	BMI < 18.5 18.5–24.9 25–29.9 ≥ 30 [P_{trend}]	 13 353 466 286	 0.36 (0.05–2.82) 1.00 1.05 (0.76–1.43) 1.19 (0.85–1.68) [0.22]	Age, sex, county of residence
Follicular lymphoma					
Pan et al. (2005) Canada 1994–1997	242 from National Enhanced Cancer Surveillance System 3106 Population	BMI 18.5– < 25 25– < 30 ≥ 30 [P_{trend}]	 110 82 47	 1.00 0.94 (0.69–1.27) 1.41 (0.97–2.03) [0.16]	Age, province, sex, education level, pack-years of smoking, alcohol consumption, exposure to some chemicals, occupational exposures, physical activity, energy intake

Table 2.2.20b Case–control studies of measures of body fatness and haematological malignancies with *inadequate* evidence

Reference Study location Period	Total number of cases Total number of controls Source of controls	Exposure categories	Exposed cases	Relative risk (95% CI)	Adjustment for confounding
Chen et al. (2011) USA 1996–2000	119 868 Population	BMI < 25 25–30 > 30 [P_{trend}]	 57 35 27	 1.0 1.2 (0.8–2.0) 1.7 (1.0–2.8) [0.127]	Age, race, total energy intake
Linet et al. (2014) Pooled analysis from InterLymph Consortium of 19 case–control studies Europe, Japan, North America	3530 22 639 Population	BMI 15– <18.5 18.5– <22.5 22.5– <25 25– <30 30– <35 35–50	 267 3481 4276 6112 1760 608	 0.67 (0.44–1.03) 1.00 1.09 (0.96–1.23) 1.01 (0.89–1.14) 1.07 (0.91–1.25) 0.93 (0.73–1.17)	
Leukaemia					
Kasim et al. (2005) Canada 1994–1997	1068 from Canadian National Enhanced Cancer Surveillance System 5039 Population	BMI All leukaemia: < 25 25–30 > 30 [P_{trend}]	 421 446 201	 1.0 1.3 (1.1–1.5) 1.6 (1.3–1.9) [< 0.0001]	Age, sex, ethnic group, education level, residence, family income, total years of passive smoking, occupational exposure to benzene and ionizing radiation, smoking status, pack-years of smoking
		AML: < 25 25–30 > 30 [P_{trend}]	 130 117 60	 1.0 1.2 (0.9–1.5) 1.6 (1.2–2.2) [0.005]	
		CML: < 25 25–30 > 30 [P_{trend}]	 63 67 39	 1.0 1.4 (1.0–2.0) 2.3 (1.5–3.4) [0.0003]	

Table 2.2.20b Case–control studies of measures of body fatness and haematological malignancies with *inadequate* evidence

Reference Study location Period	Total number of cases Total number of controls Source of controls	Exposure categories	Exposed cases	Relative risk (95% CI)	Adjustment for confounding
Strom et al. (2009) USA (Texas) 1999–2006	253 CML cases from MD Anderson Cancer Center 270 Friends and family members of MD Anderson patients recruited from non-haematological cancer clinics	BMI			Age, sex, ethnicity, agrochemical exposure, family history, weight at age 25 yr and at age 40 yr Analyses with BMI at age 25 yr and at age 40 yr gave similar results
		Men:			
		< 24.9	26	1.00	
		25–29.9	61	1.50 (0.81–2.76)	
		30–34.5	28	2.22 (1.04–4.75)	
		≥ 35	16	3.79 (1.34–10.7)	
		[P_{trend}]		[0.004]	
		Women:			
		< 24.9	45	1.00	
		25–29.9	34	1.11 (0.59–2.10)	
		30–34.5	23	2.11 (0.96–4.67)	
		≥ 35	19	2.65 (1.06–6.64)	
		[P_{trend}]		[0.01]	
Poynter et al. (2016) USA 2010–2014	420 AML cases from Minnesota Cancer Surveillance System 1388 Minnesota driver's licence/identity card list	BMI			Race/ethnicity, education level, income, smoking, physical activity, NSAID use, personal and family history of cancer, history of cancer treatment, benzene exposure, number of live births
		Men:			
		18.5–24.9	160	1.00	
		25–29.9	330	0.90 (0.56–1.45)	
		30–34.9	176	1.20 (0.72–2.01)	
		> 35	85	0.97 (0.50–1.88)	
		per 5 kg/m^2		1.09 (0.92–1.29)	
		Women:			
		18.5–24.9	212	1.00	
		25–29.9	183	0.97 (0.51–1.85)	
		30–34.9	112	1.16 (0.57–2.40)	
		> 35	77	1.60 (0.73–3.54)	
		per 5 kg/m^2		1.12 (0.93–1.35)	

AML, acute myeloid leukaemia; BMI, body mass index (in kg/m^2); CI, confidence interval; CML, chronic myeloid leukaemia; NSAID, non-steroidal anti-inflammatory drug; yr, year or years

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