

Table 2.2.23a Cohort studies of measures of body fatness and malignant melanoma

Reference Location Follow-up period	Total number of subjects Incidence/mortality	Exposure categories	Exposed cases	Relative risk (95% CI)	Covariates	Comments
Calle et al. (2003) Cancer Prevention Study II USA 1982–1998	404 576 Men Mortality	BMI				Age, education level, smoking, physical activity, alcohol consumption, marital status, race, aspirin use, fat consumption, vegetable consumption; for women, also adjusted for use of estrogen replacement therapy
		18.5–24.9	238	1.00		
		25–29.9	279	0.95 (0.80–1.13)		
	495 477 Women Mortality	≥ 30	43	0.85 (0.61–1.18)	[0.32]	
		[<i>P</i> _{trend}]				
		BMI				
18.5–24.9	166	1.00				
25–29.9	61	0.85 (0.63–1.14)				
≥ 30	28	1.10 (0.73–1.66)				
[<i>P</i> _{trend}]			[0.95]			
Samanic et al. (2004) United States Veterans cohort USA 1969–1996	4 500 700 Men Incidence	Obesity				Age, calendar year
		Non-obese	White men: 3728	1.00		
		Obese	273	1.29 (1.14–1.46)		
		Non-obese	Black men: 86	1.00		
		Obese	10	2.39 (1.20–4.75)		
		[<i>P</i> _{trend}]				
Rapp et al. (2005) Vorarlberg Health Monitoring and Promotion Program Austria 1985–2001	67 447 Men Incidence	BMI				Age, smoking status, occupation
		18.5–24.9	59	1.00		
		25–29.9	56	1.00 (0.68–1.46)		
	≥ 30	7	0.59 (0.27–1.31)			
	[<i>P</i> _{trend}]			[0.32]		
	78 484 Women Incidence	BMI				
18.5–24.9	79	1.00				
25–29.9	38	1.03 (0.68–1.54)				
≥ 30	13	0.86 (0.47–1.57)				
[<i>P</i> _{trend}]			[0.72]			
Samanic et al. (2006) Swedish Construction Worker Cohort Sweden 1958–1999	362 552 Men Incidence	BMI				Attained age, calendar year, smoking
		18.5–24.9	555	1.00		
		25–29.9	454	1.27 (1.12–1.45)		
		≥ 30	74	1.35 (1.06–1.73)		
		[<i>P</i> _{trend}]			[< 0.001]	

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Reeves et al. (2007) Million Women Study United Kingdom 1996–2005	1 222 630 Women Incidence	BMI < 22.5 22.5–24.9 25–27.4 27.5–29.9 ≥ 30 per 10 kg/m ²	346 456 384 198 251	1.15 (0.98–1.34) 1.00 (0.86–1.16) 1.02 (0.88–1.19) 1.20 (1.00–1.44) 1.37 (1.18–1.60) 1.24 (1.03–1.48)	Age, geographical region, socioeconomic status, reproductive history, smoking status, alcohol intake, physical activity	
Dennis et al. (2008) Agricultural workers cohort USA 1993–2003	44 086 Men and women Incidence	BMI < 25 25–26.9 ≥ 27 [<i>P</i> _{trend}]	67 28 73	1.0 0.69 (0.44–1.08) 0.85 (0.61–1.20) [0.40]	Age, sex, tendency to burn	
		BMI at age 20 yr < 20 20–24.9 ≥ 25 [<i>P</i> _{trend}]	26 101 41	1.0 1.90 (1.22–2.94) 2.55 (1.52–4.30) [0.0004]	Age, sex, tendency to burn	
Pothiawala et al. (2012) Nurses' Health Study and Health Professionals Follow- Up Study USA 1976–NR	143 129 Men and women Incidence	BMI 18.5–24.9 25–29.9 ≥ 30 [<i>P</i> _{trend}]	601 282 83	1.0 1.06 (0.91–1.24) 1.05 (0.83–1.34) [0.46]	Sun sensitivity, family history, number of sunburns, moles, hair colour, physical activity, CVD, diabetes, cancer	No association in either sex analysed separately, and no association for BMI at 10 yr before baseline
Bhaskaran et al. (2014) Clinical Practice Research Datalink United Kingdom 1987–2012	5 243 978 Men and women Incidence	BMI per 5 kg/m ² [<i>P</i> _{trend}]	8505 total	0.99 (0.96–1.02) [0.39]	Age, diabetes, smoking, alcohol consumption, socioeconomic status, calendar year, sex	Similar association in never-smokers

BMI, body mass index (in kg/m²); CI, confidence interval; CVD, cardiovascular disease; NR, not reported; yr, year or years

Table 2.2.23b Meta-analyses and pooled analyses of measures of body fatness and malignant melanoma

Reference Study location Period	Number and type of studies	Study population	Exposure categories	Exposed cases	Relative risk (95% CI)	Adjustment Comments
Olsen et al. (2008) Pooled analysis 1979–1993	8 case– control studies	Cancer registries and pathology laboratories Hospital-based (United Kingdom) or population- based (Australia, Canada, Denmark, Italy, USA) 2083 cases 2782 controls Women	BMI in early adulthood			Age
			< 18.5	150	1.1 (0.8–1.6)	
			18.5–24.9	849	1.0	
			25–29.9	50	0.9 (0.8–1.1)	
			≥ 30	13	0.9 (0.7–1.2)	
			Weight change since early adulthood			
Loss of ≥ 2 kg	109	1.2 (0.7–2.7)				
Gain/loss of < 2 kg	208	1.0				
Gain of ≥ 2 kg	852	1.5 (1.1–2.0)				
Sergentanis et al. (2013) Meta-analysis	10 cohort studies	7895 incident cases 6 368 671 subjects	BMI			Cut-off values differ between studies
			Overweight	Men:	1.29 (1.15–1.45)	
			Obese		1.30 (1.17–1.45)	
			Overweight	Women:	0.99 (0.92–1.07)	
	Obese		0.87 (0.70–1.08)			
	11 case– control studies	4460 cases 6342 controls	Overweight	Men:	1.37 (1.11–1.69)	
			Obese		1.36 (1.06–1.75)	
			Overweight	Women:	0.97 (0.84–1.12)	
			Obese		1.16 (0.87–1.53)	
	All studies		Overweight	Men:	1.31 (1.18–1.45)	
Obese				1.31 (1.19–1.44)		
		Overweight	Women:	0.98 (0.92–1.05)		
		Obese		0.99 (0.83–1.18)		

BMI, body mass index (in kg/m²); CI, confidence interval

References

- Bhaskaran K, Douglas I, Forbes H, dos-Santos-Silva I, Leon DA, Smeeth L (2014). Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5.24 million UK adults. *Lancet*. 384(9945):755–65. [http://dx.doi.org/10.1016/S0140-6736\(14\)60892-8](http://dx.doi.org/10.1016/S0140-6736(14)60892-8) PMID:25129328
- Calle EE, Rodriguez C, Walker-Thurmond K, Thun MJ (2003). Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. *N Engl J Med*. 348(17):1625–38. <http://dx.doi.org/10.1056/NEJMoa021423> PMID:12711737
- Dennis LK, Lowe JB, Lynch CF, Alavanja MC (2008). Cutaneous melanoma and obesity in the Agricultural Health Study. *Ann Epidemiol*. 18(3):214–21. <http://dx.doi.org/10.1016/j.annepidem.2007.09.003> PMID:18280921
- Olsen CM, Green AC, Zens MS, Stukel TA, Bataille V, Berwick M, et al. (2008). Anthropometric factors and risk of melanoma in women: a pooled analysis. *Int J Cancer*. 122(5):1100–8. <http://dx.doi.org/10.1002/ijc.23214> PMID:17990316
- Pothiwala S, Qureshi AA, Li Y, Han J (2012). Obesity and the incidence of skin cancer in US Caucasians. *Cancer Causes Control*. 23(5):717–26. <http://dx.doi.org/10.1007/s10552-012-9941-x> PMID:22450736
- Rapp K, Schroeder J, Klenk J, Stoehr S, Ulmer H, Concin H, et al. (2005). Obesity and incidence of cancer: a large cohort study of over 145,000 adults in Austria. *Br J Cancer*. 93(9):1062–7. <http://dx.doi.org/10.1038/sj.bjc.6602819> PMID:16234822
- Reeves GK, Pirie K, Beral V, Green J, Spencer E, Bull D; Million Women Study Collaboration (2007). Cancer incidence and mortality in relation to body mass index in the Million Women Study: cohort study. *BMJ*. 335(7630):1134. <http://dx.doi.org/10.1136/bmj.39367.495995.AE> PMID:17986716
- Samanic C, Chow WH, Gridley G, Jarvholm B, Fraumeni JF Jr (2006). Relation of body mass index to cancer risk in 362,552 Swedish men. *Cancer Causes Control*. 17(7):901–9. <http://dx.doi.org/10.1007/s10552-006-0023-9> PMID:16841257
- Samanic C, Gridley G, Chow WH, Lubin J, Hoover RN, Fraumeni JF Jr (2004). Obesity and cancer risk among white and black United States veterans. *Cancer Causes Control*. 15(1):35–43. <http://dx.doi.org/10.1023/B:CACO.0000016573.79453.ba> PMID:14970733
- Sergentanis TN, Antoniadis AG, Gogas HJ, Antonopoulos CN, Adami HO, Ekblom A, et al. (2013). Obesity and risk of malignant melanoma: a meta-analysis of cohort and case-control studies. *Eur J Cancer*. 49(3):642–57. <http://dx.doi.org/10.1016/j.ejca.2012.08.028> PMID:23200191