
Article:
Keum, N, Greenwood, DC, Lee, DH et al. (5 more authors) (2015) Adult weight gain and adiposity-related cancers: a dose-response meta-analysis of prospective observational studies. Journal of the National Cancer Institute, 107 (2). djv088. ISSN 0027-8874

https://doi.org/10.1093/jnci/djv088

Supplementary Materials

Supplementary Table 1. Database search strategy

Breast cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Breast Neoplasms"[Mesh] OR breast cancer*[tiab] OR breast neoplas*[tiab] OR breast tumo*[tiab] OR breast carcinoma*[tiab] OR cancer of the breast [tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT(Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('breast cancer'/exp OR (breast NEAR/2 (cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Colorectal cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Colorectal Neoplasms"[Mesh] OR colorectal cancer*[tiab] OR colorectal neoplasm*[tiab] OR colorectal tumo*[tiab] OR colorectal carcinoma*[tiab] OR colon cancer*[tiab] OR colonic cancer*[tiab] OR colon neoplasm*[tiab] OR colonic neoplasm*[tiab] OR colon tumo*[tiab] OR colonic tumo*[tiab] OR colon carcinoma*[tiab] OR colonic carcinoma*[tiab] OR cancer of the colon[tiab] OR rectal cancer*[tiab] OR rectum cancer*[tiab] OR rectal neoplasm*[tiab] OR rectum neoplasm*[tiab] OR rectal tumo*[tiab] OR rectum tumo*[tiab] OR rectal carcinoma*[tiab] OR rectum carcinoma*[tiab] OR cancer of the rectum[tiab])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('colon cancer'/exp OR 'rectum cancer'/exp OR ((colon OR colonic OR rectal OR rectum OR colorectal) NEAR/2 (cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Endometrial cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Endometrial Neoplasms"[Mesh] OR endometrial cancer*[tiab] OR endometrium cancer*[tiab] OR endometrial neoplas*[tiab] OR endometrium neoplas*[tiab] OR endometrial tumo*[tiab] OR endometrium tumo*[tiab] OR endometrial carcinoma*[tiab] OR endometrium carcinoma*[tiab] OR cancer of the endometrium

		[tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('endometrium cancer'/exp OR ((endometrial OR endometrium) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Esophageal cancer	**Pubmed**	("Body Weight"[mesh] OR body weight [tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Esophageal Neoplasms"[Mesh] OR esophageal cancer*[tiab] OR esophagus cancer*[tiab] OR esophageal neoplas*[tiab] OR esophagus neoplas*[tiab] OR esophageal tumo*[tiab] OR esophagus tumo*[tiab] OR esophageal carcinoma*[tiab] OR esophagus carcinoma*[tiab] OR cancer of the esophagus [tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('esophagus cancer'/exp OR ((esophageal OR esophagus) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Gallbladder cancer	**Pubmed**	("Body Weight"[mesh] OR body weight [tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Gallbladder Neoplasms"[Mesh] OR gallbladder cancer*[tiab] OR gallbladder neoplas*[tiab] OR gallbladder tumo*[tiab] OR gallbladder carcinoma*[tiab] OR cancer of the gallbladder [tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT(Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('gallbladder cancer'/exp OR ((gallbladder) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Kidney cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Kidney Neoplasms"[Mesh] OR kidney cancer*[tiab] OR renal

		cancer*[tiab] OR kidney neoplas*[tiab] OR renal neoplas*[tiab] OR kidney tumo*[tiab] OR renal tumo*[tiab] OR kidney carcinoma*[tiab] OR renal carcinoma*[tiab] OR cancer of the kidney [tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('kidney cancer'/exp OR ((renal OR kidney) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Ovarian cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Ovarian Neoplasms"[Mesh] OR ovarian cancer*[tiab] OR ovary cancer[tiab] OR ovarian neoplasm*[tiab] OR ovary neoplasm*[tiab] OR ovarian tumo*[tiab] OR ovary tumo*[tiab] Or ovarian carcinoma*[tiab] OR ovary carcinoma*[tiab] OR cancer of the ovary[tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('ovarian cancer'/exp OR ((ovarian OR ovary) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Pancreatic cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Pancreatic Neoplasms"[Mesh] OR pancreatic cancer*[tiab] OR pancreas cancer*[tiab] OR pancreatic neoplas*[tiab] OR pancreas neoplas*[tiab] OR pancreatic tumo*[tiab] OR pancreas tumo*[tiab] OR pancreatic carcinoma*[tiab] OR pancreas carcinoma*[tiab] OR cancer of the pancreas [tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('pancreas cancer'/exp OR ((pancreatic OR

		pancreas) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Prostate cancer	**Pubmed**	("Body Weight"[mesh] OR body weight[tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND("Prostatic Neoplasms"[Mesh] OR prostatic cancer*[tiab] OR prostate cancer[tiab] OR prostatic neoplasm*[tiab] OR prostate neoplasm*[tiab] OR prostatic tumo*[tiab] OR prostate tumo*[tiab] OR prostatic carcinoma*[tiab] OR prostate carcinoma*[tiab] OR cancer of the prostate[tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('prostate cancer'/exp OR ((prostate OR prostatic) NEAR/2 (cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim
Thyroid cancer	**Pubmed**	("Body Weight"[mesh] OR body weight [tw] OR weight gain[tw] OR weight increase[tw] OR weight change[tw]) AND ("Thyroid Neoplasms"[Mesh] OR thyroid cancer*[tiab] OR thyroid neoplas*[tiab] OR thyroid tumo*[tiab] OR thyroid carcinoma*[tiab] OR cancer of the thyroid [tiab]) NOT ("Animals"[Mesh] NOT "Humans"[Mesh]) NOT (Comment[ptyp] OR Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR News[ptyp] OR "Case-Control Studies"[Mesh])
	Embase	('body weight'/de OR 'weight gain'/exp OR 'weight change'/exp OR 'body mass'/exp OR (weight NEAR/2 (gain OR increase OR change)):ti,ab) AND ('thyroid cancer'/exp OR ((thyroid) NEAR/2(cancer* OR neoplasm* OR tumo* OR carcinoma*)):ti,ab) NOT ([animals]/lim NOT [humans]/lim) NOT ('conference abstract'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it OR 'case report'/de OR 'in vitro study'/de OR 'nonhuman'/de OR 'case control study'/exp) AND [embase]/lim

Supplementary Table 2. Characteristics of studies included

First author, Year, Country, Reference	Cohort study name	Follow-up period	No. of cases, Sex, Age at baseline No. participants	AWG: Definition, Assessment (early,later), Validation of later W	BC by menopausal status at diagnosis, HRT use	Highest vs. lowest AWG (kg)*	RR (95%CI)	Inclusion in dose-response meta-analysis	Variables adjusted for:
Breast Cancer									
Catsburg 2014 Canada (1)	Canadian Study of Diet, Lifestyle, and Health	(1992/1998)-(2005/2010)	548 F 46yrs 1,666	since 20 NR NR	Pre	15.9 vs. 0	1.05 (0.71, 1.56)		age, age at menarche, OC use, parity, age at first birth, family history, alcohol consumption, physical activity
			336 F 68yrs 2,751		Post Users	15.9 vs. 0	1.44 (0.88, 2.36)		
Alsaker 2013 Norway (2)	Nord Trondelag Health Study 2	1995---(mean 12.8yrs)	440 F 30-55yrs 18,147	since 18 (M,M) NR	post, combined (low use)	8.7 vs. 0	1.49 (1.11, 2.01)	**V**	age, BMI at age 18, height, calendar time, age at menarche, age at first birth, parity, education, alcohol intake, smoking, exercise
Krishnan 2013 Australia (3)	Melbourne Collaborative Cohort Study	1990-2010	631 F 60yrs 10,879	since 18-21 (R,M) NR	post, combined	23.0 vs. 5.1	1.17 (0.96, 1.42)	**V (S)**	age, BMI at age 18-21, height, country of birth, education, age at menarche, parity, lactation, OC use, HRT use, smoking, alcohol intake, physical activity, energy from diet
Michels 2012 USA (4)	Nurses' Health Study (NHS) & NHS II	NHS: 1976-2008 NHSII: 1989-2007	1,699 F NHS: 30-55yrs NHSII: 25-42yrs 37,046	since 18 (R,R) validated	Pre	27.5 vs. 0	0.78 (0.55, 1.11)	**V**	age, weight at age 18, height, calendar time, family history of breast cancer, history of benign breast disease, education, alcohol intake, smoking, exercise, age at menarche, parity, age at first birth, physical activity, OC use
White 2012 USA (5)	Multiethnic Cohort	1993-2004	2,872 F ≥55yrs 77,132	since 21 (R,R) validated	post, combined	27.0 vs.1.8	1.51 (1.34, 1.70)	**V (S)**	age, baseline BMI, height, family history, age at first birth, HRT use, age at menarche, age and type of menopause, parity, smoking, physical activity, alcohol

									intake, caloric intake per day
Kawai 2010 Japan (6)	Miyagi Cohort Study	1990-2003	90 F 40-64yrs 7,344	since 20 (R,R) validated	post, combined (low use)	14.0 vs. 0	1.55 (0.70, 3.45)	**V**	age, weight at age 20, height, alcohol intake, smoking, occupation, walking, education, age at menarche, parity, age at menopause, family history of breast cancer, HRT use
Palmer 2007 USA (7)	Black Women's Health Study	1995-2005	490 F 21-69yrs 31,464	since 18 (R,R) validated	pre	27.5 vs. 5	1.17 (0.90, 1.52)	**V**	age, BMI at age 18, age at menarche, age at first birth, parity, physical activity, education, family history of breast cancer, age at menopause (for postmenopausal breast cancer only)
			443 F 21-69yrs 11,077		post combined	27.5 vs. 5	1.09 (0.81, 1.48)		
			160 F 21-69yrs 3,982		post non-user	27.5 vs. 5	1.40 (0.84, 2.32)	**V**	
Ahn 2007 USA (8)	NIH-AARP Diet and Health Study	1996-2000	1,835 F 55-69yrs 83,288	since 18 (R,R) not validated	post, combined	35.0 vs. 0	1.30 (1.02, 1.67)		age, weight at age 18, height, age at menarche, age at menopause, age at first birth, parity, smoking, education, race, family history of breast cancer, fat intake, alcohol intake, oophorectomy, physical activity
			803 F 55-69yrs 43,253		post, non-users	35.0 vs. 0	1.87 (1.29, 2.72)	**V**	
			1,032 F 55-69yrs 40,035		post, users	35.0 vs. 0	0.98 (0.70, 1.36)		
Eliassen 2006 USA (9)	Nurses' Health Study	1976-2002	1,304 F 30-55yrs 15,508	since 18 (R,R) validated	post, non-users	27.5 vs. 0	1.98 (1.55, 2.53)	**V**	age, weight at age 18, height, calendar time, age at menarche, parity, age at first birth, family history of breast cancer, history of benign breast disease, alcohol intake, HRT use, age at menopause
			2,507 F 30-55yrs 24,742		post, users	27.5 vs. 0	1.20 (1.01, 1.43)		
Lahmann 2005 10 European countries	European Prospective Investigation into Cancer	1992-2004	220 F 34-52yrs 36,381	since 20 (R,M) NR	pre	22.5 vs. 0	0.87 (0.51, 1.49)	**V**	age, weight at 20, height, center, age at menarche, age at first birth, parity, education, alcohol intake, smoking,

(10)	and Nutrition		1,020 F 57-63yrs 51,432		post, combined	22.5 vs. 0	1.23 (0.96, 1.58)		physical activity, OC use (for premenopausal breast cancer only)
			591 F 57-63yrs 37,767		post, non-users	22.5 vs. 0	1.52 (1.08, 2.13)	**V**	
			429 F 57-63yrs 13,665		post, users	22.5 vs. 0	0.95 (0.65, 1.38)		
Feigelson 2004 USA (11)	Cancer Prevention Study-II	1992-2001	1,934 F 63yrs 62,756	since 18 (R,R) not validated	post, combined	34.2 vs. 0	1.68 (1.27, 2.21)		age, baseline BMI, height, age at menarche, age at first birth, parity, age at menopause, OC use, family history of breast cancer, history of breast cysts, screening mammography, education, physical activity, alcohol intake, race
			1,182 F 63yrs 41,159		post non-users	34.2 vs. 0	2.13 (1.50, 3.01)	**V**	
			752 F 63yrs 21,597		post, users	34.2 vs. 0	1.13 (0.72, 1.76)		
Radimer 2004 USA (12)	Framingham Study	1948-1999	143 F 28-62yrs 916	since 25 (R,M) NR	post, combined	27.5 vs. 0	1.20 (0.50, 2.70)	**V** **(S)**	age, baseline BMI, height, center, HRT use, age at first birth, parity, alcohol use, smoking
Sweeney 2004 USA (13)	Iowa Women's Health Study	1986-2001	2,274 F 55-69yrs 31,629	since 18 (R,R) validated	post, combined	23.5 vs. 3	1.71 (1.52, 1.93)	**V** **(S)**	age, height, education, age at first birth, parity, age at menarche, age at menopause, family history of breast cancer
Breslow 2001 USA (14)	Epidemiologic Follow-up Study of NHANES I	1982-1992	83 F 40-70yrs 2,736	since 25 (R,M) NR	post, combined	25.0 vs. 2.5	1.74 (0.91, 3.30)	**V** **(S)**	age, BMI at age 25, height, birth year, physical activity, sample design variables, education, age at menarche, parity, menstrual status, family history
van den Brandt 1997 Netherlands (15)	Netherlands Cohort Study	1986-1990	453 F 63yrs 1,212	since 20 (R,R) not validated	post, combined	27.5 vs. 2.5	1.57 (0.99, 2.47)	**V** **(S)**	age, height, age at menarche, parity, age at first birth, alcohol intake
First author, Year,	**Cohort study name**	**Follow-up period**	**No. of cases,**	**AWG: Definition,**	**PC by stage**	**Highest vs.**	**RR (95%CI)**	**Inclusion in dose-**	**Variables adjusted for**

Country, Reference			Sex, Age at baseline No. participants	Assessment (early,later), Validation of later W		lowest AWG (kg)*		response meta-analysis	
Prostate Cancer									
Bassett, 2012 Australia (16)	Melbourne Collaborative Cohort Study	1990-2009	1,374 M 56yrs 16,514	since 18, (R,M) NR	combined	25.0 vs. 2.5	1.11 (0.93, 1.32)	**V**	age, weight at age 18, height, country of birth, education
			964 M 56yrs 16,514		localized	25.0 vs. 2.5	0.99 (0.81, 1.22)	**V**	
			410 M 56yrs 16,514		aggressive	25.0 vs. 2.5	1.37 (1.02, 1.83)	**V**	
Chamberlain 2011 Norway (17)	Nord-Trondelag Health Study	1984-2005	524 M 44-57yrs 18,260	since at least 20, (M,M) NR	combined	8.0 vs. 0	1.02 (0.78, 1.33)	**V**	age, baseline weight, height, education, smoking, marital status, physical activity
			175 M 44-57yrs 18,260		localized	8.0 vs. 0	0.76 (0.48, 1.19)	**V**	
			100 M 44-57yrs 18260		aggressive	8.0 vs. 0	0.74 (0.39, 1.40)	**V**	
Rodriguez 2007 USA (18)	Cancer Prevention Study II Nutrition Cohort	1992-2003	4,210 M 40-64yrs 34,639	since 40, (R,R) not validated	Combined	11.7 vs. 0	0.89 (0.79, 1.00)	**V**	age, BMI in year 1982, height, race, education, family history of prostate cancer, total calorie intake, smoking, history of PSA, history of diabetes, physical activity
			3,858 M 40-64yrs 34,639		Localized	7.2 vs. 0	0.94 (0.87, 1.01)	**V**	
			227 M 40-64yrs 34,639		Aggressive	7.2 vs. 0	0.97 (0.71, 1.33)	**V**	
Littman 2007 USA	Vitamins and Lifestyle Cohort	2000-2004	774 M 62yrs	since 18, (R,R) not validated	Combined	17.2 vs. 2.2	0.77 (0.59, 1.00)	**V**	age, baseline BMI, family history of prostate cancer, race, history of PSA

(19)			32,696						screening
			407 M 62yrs 32,329		Localized	17.2 vs. 2.2	0.67 (0.47, 0.95)	V	
			357 M 62yrs 32,279		Aggressive	17.2 vs. 2.2	0.94 (0.61, 1.50)	V	
Hernandez 2009 USA (20)	Multiethnic Cohort	1993-2004	5,285 M 45-75yrs 83,879	since 21, (R,R) not validated	Combined	21.6 vs. 1.1	1.03 (0.94,1.12)		age, weight at age 21, height, ethnicity, marital status, family history of prostate cancer, birthplace, education, smoking
			4,231 M 45-75yrs 83,879		Localized	21.6 vs. 1.1	1.02 (0.93, 1.13)		
			602 M 45-75yrs 83,879		Aggressive	21.6 vs. 1.1	1.06 (0.81, 1.40)		
Wright 2007 USA (21)	NIH-AARP Diet and Health Study	1995-2000	5,433 M 62yrs 172,961	since 18, (R,R) validated	Combined	45.0 vs. 0	1.03 (0.88, 1.20)		age, weight at age 18, height, race, smoking, education, history of diabetes, family history of prostate cancer
			4,709 M 62yrs 172,961		Localized	45.0 vs. 0	1.03 (0.87, 1.22)		
			724 M 62yrs 172,961		Aggressive	45.0 vs. 0	0.99 (0.65, 1.51)		
Jonsson 2003 Sweden (22)	Swedish Twin Registry	1969-1997	408 M 56yrs 19,374	since 25, (R,R) not validated	Combined	25.5 vs. 2.5	1.10 (0.70, 1.80)		age, weight at age 25, BMI at baseline
Giovannucci 1997 USA (23)	Health Professionals Follow-up Study	1986-1994	1,369 M 40-75yrs 47,781	since 21 (R,R) validated	Combined	18.2 vs. 2.3	0.89 (0.69, 1.16)		age, BMI at age 21
			423 M 40-75yrs 47,781		Aggressive		0.98 (0.64, 1.49)		

First author, Year, Country, Reference	Cohort study name	Follow-up period	No. of cases, Sex, Age at baseline No. participants	AWG: Definition, Assessment (early,later), Validation of later W	CRC by sex	Highest vs. lowest AWG (kg)*	RR (95%CI)	Inclusion in dose-response meta-analysis	Variables adjusted for
Colorectal Cancer									
Aleksandrova 2013 10 European countries (24)	European Prospective Investigation into Cancer and Nutrition	1992-2010	CC: 660 M 55yrs 69,046	since 20, (R,M) NR	M	22.5 vs. 0	1.31 (0.78, 2.19)	**V**	age, weight at age 20, smoking, education, alcohol intake, physical activity, red/processed meat intake, fish/shellfish intake, fruits and vegetables intake vegetables and fiber intake
			CC: 703 F 51yrs 115,849		F	22.5 vs. 0	1.49 (0.92, 2.42)	**V**	
Bassett 2010 Australia (25)	Melbourne Collaborative Cohort Study	1990-2007	CC: 269 M 56yrs 15,557	since 18, (R,M) NR	M	25.0 vs. 0	1.47 (0.94, 2.31)	**V**	age, weight at age 18, height, country of birth, education, meat intake, fruit and vegetable consumption, fat intake, daily energy intake, smoking, alcohol intake
			CC: 275, F 55yrs 22,240		F	25.0 vs. 0	0.96 (0.64, 1.44)	**V**	
Laake 2010 Norway (26)	Norwegian Counties Cohort Study	1974-2005	CC: 238 M 41yrs 18,026	since 20-34, (M,M) NR	M	12.5 vs. 0	1.45 (0.91, 2.31)	**V**	age, baseline BMI, height, physical activity, energy intake, smoking, education, county of residence
			CC: 213 F 41yrs 18,000		F	12.5 vs. 0	1.20 (0.77, 1.88)	**V**	
Thygesen 2008 USA (27)	Health Professionals Follow-up Study	1988-2004	CC: 551 M 54yrs 39,546	since 21, (R,R) validated	M	29.0 vs. 0	1.41 (0.83, 2.41)	**V**	age, BMI at age 21, physical activity, alcohol intake, folate, methionine, vitamin D, calcium, calories, processed/red meat, smoking, multivitamin use, aspirin use, endoscopic screening, family history of CRC.
Larsson 2006 Sweden (28)	Cohort of Swedish Men	1997-2005	CRC: 496 M 45-79yrs NR	since 20, (R,R) validated	M	25.0 vs. 0	1.16 (0.81, 1.65)		age, height, education, family history of CRC, history of diabetes, smoking, aspirin use, physical activity

Martinez 1997 USA (29)	Nurses' Health Study	1980-1992	CC: 393 F 34-59yrs NR	since 18, (R,R) validated	F	>20.0 vs. 0	1.08 (0.79, 1.48)		age, BMI at age 18, family history of CRC, smoking, aspirin use, alcohol intake, red meat intake, HRT use
First author, Year, Country, Reference	**Cohort study name**	**Follow-up period**	**No. of cases, Sex, Age at baseline No. participants**	**AWG: Definition, Assessment (early,later), Validation of later W**	**EC by menopausal status at diagnosis, HRT use**	**Highest vs. lowest AWG (kg)***	**RR (95%CI)**	**Inclusion in dose-response meta-analysis**	**Variables adjusted for**
Endometrial Cancer									
Canchola 2010 USA (30)	California Teachers Study cohort	(1995/1996)-2006	94 F median 61yrs 8,002	since 18, (R,R) validated	post, non-users	21.4 vs. 2.3	3.7 (2.00, 7.10)	**V**	age at menarche, parity, age at first full term pregnancy, OC use and duration, physical activity, height, hypertension
			149 F median 61yrs 11,041		post, users	21.4 vs. 2.3	1.50 (0.93, 2.30)	**V**	
Chang 2007 USA (31)	National Institutes of Health - AARP Diet and Health Study	(1996/1997)-2000	191 F 51-72 25,338	since 18, (R,R) not validated	post, non-users	27.5 vs. 2.5	5.29 (2.97, 9.42)	**V**	age, weight at age 18, physical activity, personal history of diabetes, age at menarche, parity, age at menopause, history of OC use, smoking, race
			185 F 51-72 24,292		post, users	27.5 vs. 2.5	1.48 (0.98, 2.24)	**V**	
Friedenreich 2007 Europe (32)	The European Prospective Investigation into Cancer and Nutrition (EPIC)	(1992/2000)-(1999/2004)	252 F 50yrs 92,129	since 20 or 25 (R,M) validated	combined (pre+post)	22.5 vs. 0	1.75 (1.11, 2.77)	**V (S)**	age, center, weight at age 20, physical activity, age at menarche, menopausal status, age at menopause, number of pregnancies, age at birth of last child, OC use, HRT use, education, smoking, hypertension, diabetes, fruit and veggie intake, fiber intake, carbohydrate intake, energy intake
Jonsson 2003 Sweden (22)	Swedish Twin Registry	1969-1997	107 F 56yrs 19,374	since 25 (R,R) not validated	combined (mostly post), NR	25.5 vs. 2.5	2.50 (1.10, 5.40)		age, weight at age 25, recent BMI
First author,	**Cohort**	**Follow-up**	**No. of**	**AWG:**	**OC by**	**Highest**	**RR**	**Inclusion**	**Variables adjusted for**

Year, Country, Reference	study name	period	cases, Sex, Age at baseline No. participants	Definition, Assessment (early,later), Validation of later W	menopausal status at diagnosis, HRT use	vs. lowest AWG (kg)*	(95%CI)	in dose-response meta-analysis	
Ovarian Cancer									
Ma 2013 China (33)	Shanghai Women's Health Study	(1996/2000)-2009	152 F 53yrs 70,258	since 20 (R,M) validated	combined, mostly non-users	19.0 vs. 2.0	2.33 (1.33, 4.06)	**V (S)**	age, weight at age 20, education
Canchola 2010 USA (34)	California Teachers Study	(1997/1998)-2007	91 F 55yrs 22,176	since 18 (R,R) validated	post, non-users	24.6 vs. 2.3	1.80 (1.00, 3.00)	**V**	age, weight at 18, height, race, OC use, wine consumption, PA, smoking, history of tubal ligation
Schouten 2003 Netherlands (35)	Netherlands Cohort Study on Diet and Cancer	1986-1993	126 F 62yrs 1,808	since 20 (R,R) validated	post, combined (low use)	27.5 vs. 2.5	1.72 (0.72, 4.10)	**V**	age, height, OC use, parity, HRT use
Lahmann 2010 Europe (36)	European Prospective Investigation into Cancer and Nutrition	(1992/2000)-(2004/2006)	52 F 52yrs (all population) 118,493 (pre+post)	since 20 or 25 (R,M) validated	pre	22.5 vs. 2.5	1.48 (0.57, 3.85)		age, study center, weight at age 20, parity, age at menarche, smoking, OC use, education, unilateral ovariectomy, menopausal status, HRT use, postmenopausal women
			243 F 52yrs (all population) 118,493 (pre+post)		post, combined	22.5 vs. 2.5	0.96 (0.67, 1.38)		
Jonsson 2003 Sweden (22)	Swedish Twin Registry	1969-1997	81 F 56yrs 19,374	since 25 (R,R) not validated	combined, (mostly post) NR	25.5 vs. 2.5	1.10 (0.40, 3.30)		age, weight at age 25, recent BMI
Fairfield 2002 USA (37)	Nurses' Health Study	1980-1996	204 F 46yrs NR (<109,445)	since 18 (R,R) validated	combined, combined	25.0 vs. 0	0.92 (0.50, 1.69)		age, BMI at age 18, OC use, parity, age at menarche, smoking, tubal ligation history
First author, Year, Country, Reference	**Cohort study name**	**Follow-up period**	**No. of cases, Sex, Age at baseline No. participants**	**AWG: Definition, Assessment (early,later), Validation of later W**	**PaC by sex**	**Highest vs. lowest AWG (kg)***	**RR (95%CI)**	**Inclusion in dose-response meta-analysis**	**Variables adjusted for**
Pancreatic Cancer									
Johansen 2009	The Malmo Prevention	(1974/1992)-2004	170 M/F	since 30 (R,M)	M/F	>10kg gain;	1.07 (0.77, 1.48)		age, sex, smoking, Mm-MAST category, BMI

Sweden (38)	Project		46yrs 26,902	validated		yes vs. no			
Luo 2008 USA (39)	Women's Health Initiative	(1993/1998)-2005	250 F 50-79 138,504	during adult life (R,M) not validated	F	steady gain vs. stable	0.90 (0.60, 1.20)		age, different treatment assignments in clinical trials, smoking, diabetes history at baseline
Patel 2005 USA (40)	Cancer Prevention Study (CPS-II) Nutrition Cohort	1992-1999	222 M/F 63yrs 145,627	since 18 (R,R) not validated	M/F	15.9 vs. 1.1	0.96 (0.61, 1.52)	V	age, sex, smoking, time since quitting for smokers, height, alcohol, education, family history of pancreatic cancer, personal history of gallbladder disease, personal history of diabetes, total caloric intake, fruit and vegetable intake, BMI, physical activity
			125 M 64yrs 69,589		M	15.9 vs. 1.1	1.59 (0.82, 3.08)		
			97 F 62yrs 76,038		F	15.9 vs. 1.1	0.50 (0.25, 1.00)		
Isaksson 2002 Sweden (41)	Swedish Twin Registry	1969-1997	102 M/F 56yrs 16,413	since 25 (R,R) not validated	M/F	14.5 vs. 3.5	1.46 (0.87, 2.45)	V	age, sex, smoking
First author, Year, Country, Reference	**Cohort study name**	**Follow-up period**	**No. of cases, Sex, Age at baseline No. participants**	**AWG: Definition, Assessment (early,later), Validation of later W**	**KC by sex**	**Highest vs. lowest AWG (kg)***	**RR (95%CI)**	**Inclusion in dose-response meta-analysis**	**Variables adjusted for**
Kidney Cancer									
Adams 2008 USA (42)	National Institutes of Health - AARP Diet and Health Study	(1996/1997)-2003	545 M 51-72yrs 185,758	weight change during age 18-35 (R,R) not validated	M	25 vs. 0	1.71 (1.21, 2.41)		age, BMI at age 18, height at age 18, smoking, protein intake, physical activity, history of diabetes, history of hypertension
			157 F 51-72yrs 134,860		F	25 vs. 0	1.49 (0.61, 3.60)		
Luo 2007 USA (43)	Women's Health Initiative	(1993/1998)-2005	376 F 50-79yrs 140,057	during adult life (R,M) Validated	F	steady gain vs. stable	1.20 (0.90, 1.70)		age, participation in the observational study or clinical trials, treatment assignments in clinical trials, smoking, hypertension, OC use, total energy intake, waist-to-hip

								ratio
First author, Year, Country, Reference	**Cohort study name**	**Follow-up period**	**No. of cases, Sex, Age at baseline No. participants**	**AWG: Definition, Assessment (early,later), Validation of later W**	**TC by sex**	**Highest vs. lowest AWG (kg)***	**RR (95%CI)**	**Inclusion in dose-response meta-analysis**	**Variables adjusted for**
Thyroid Cancer									
Kitahara 2012 USA (44)	NIH-AARP Diet and Health Study	(1995/1996)-2006	106 M 64yrs 125,347	since 18 (R,R) not validated	M F	12.5 vs. 0	1.75 (0.89, 3.43)		race, education, smoking, old weight
			105 F 63yrs 72,363			12.5 vs. 0	1.08 (0.67, 1.74)		
Kabat 2012 USA (45)	Women's Health Initiative	(1993/1998)-2011	151 F 63yrs 144,319	since 18 (R,M) not validated	M/F	27.3 vs. 0	1.00 (0.57, 1.78)		age, weight at age 18, age at first pregnancy, education, smoking, alcohol, physical activity, history of benign thyroid disease, randomization status in the controlled trial component
Iribarren 2001 USA (46)	Health-Maintenance Organization (HMO) in Northern California	(1964/1973)-1997	196 M/F 40yrs 204,964	since 18 (R,M) Validated	M/F	12.5 vs. 2.5	0.88 (0.57, 1.38)		age, recent BMI, sex, race, education, smoking, alcohol, personal and family history of benign thyroid diseases, height, occupational exposures

* Represents the midpoint of category-specific adult weight gain.

† AWG =adult weight gain; BC = breast cancer; BMI = body mass index; CC = colon cancer; CI = confidence interval; CRC = colorectal cancer; EC = endometrial cancer; HRT = hormone replacement therapy; KC = kidney cancer; M = males (for sex) or measured (for AWG assessment); Mm-MAST = Malmo modification of the brief Michigan Alcoholism Screening Test; No. = number; NR = not reported; OC = ovarian cancer (for cancer site) or oral contraceptive (for variables adjusted for); PaC = pancreatic cancer; PC = prostate cancer; PSA = prostate-specific antigen; R = self-reported; RR = relative risk; S = sensitivity analysis; TC = thyroid cancer; W = weight; yrs = years.

References

1. Catsburg C, Kirsh VA, Soskolne CL, et al. Associations between anthropometric characteristics, physical activity, and breast cancer risk in a Canadian cohort. *Breast Cancer Res Treat* 2014;145(2):545-552.
2. Alsaker MD, Janszky I, Opdahl S, et al. Weight change in adulthood and risk of postmenopausal breast cancer: the HUNT study of Norway. *Br J Cancer* 2013;109(5):1310-1317.
3. Krishnan K, Bassett JK, MacInnis RJ, et al. Associations between weight in early adulthood, change in weight, and breast cancer risk in postmenopausal women. *Cancer Epidemiol Biomarkers Prev* 2013;22(8):1409-1416.
4. Michels KB, Terry KL, Eliassen AH, et al. Adult weight change and incidence of premenopausal breast cancer. *Int J Cancer* 2012;130(4):902-909.
5. White KK, Park SY, Kolonel LN, et al. Body size and breast cancer risk: the Multiethnic Cohort. *Int J Cancer* 2012;131(5):E705-716.
6. Kawai M, Minami Y, Kuriyama S, et al. Adiposity, adult weight change and breast cancer risk in postmenopausal Japanese women: the Miyagi Cohort Study. *Br J Cancer* 2010;103(9):1443-1447.
7. Palmer JR, Adams-Campbell LL, Boggs DA, et al. A prospective study of body size and breast cancer in black women. *Cancer Epidemiol Biomarkers Prev* 2007;16(9):1795-1802.
8. Ahn J, Schatzkin A, Lacey JV, Jr., et al. Adiposity, adult weight change, and postmenopausal breast cancer risk. *Arch Intern Med* 2007;167(19):2091-2102.
9. Eliassen AH, Colditz GA, Rosner B, et al. Adult weight change and risk of postmenopausal breast cancer. *Jama* 2006;296(2):193-201.
10. Lahmann PH, Schulz M, Hoffmann K, et al. Long-term weight change and breast cancer risk: the European prospective investigation into cancer and nutrition (EPIC). *Br J Cancer* 2005;93(5):582-589.
11. Feigelson HS, Jonas CR, Teras LR, et al. Weight gain, body mass index, hormone replacement therapy, and postmenopausal breast cancer in a large prospective study. *Cancer Epidemiol Biomarkers Prev* 2004;13(2):220-224.
12. Radimer KL, Ballard-Barbash R, Miller JS, et al. Weight change and the risk of late-onset breast cancer in the original Framingham cohort. *Nutr Cancer* 2004;49(1):7-13.
13. Sweeney C, Blair CK, Anderson KE, et al. Risk factors for breast cancer in elderly women. *Am J Epidemiol* 2004;160(9):868-875.
14. Breslow RA, Ballard-Barbash R, Munoz K, et al. Long-term recreational physical activity and breast cancer in the National Health and Nutrition Examination Survey I epidemiologic follow-up study. *Cancer Epidemiol Biomarkers Prev* 2001;10(7):805-808.
15. van den Brandt PA, Dirx MJ, Ronckers CM, et al. Height, weight weight change, and postmenopausal breast cancer risk: The Netherlands Cohort Study. *Cancer Causes Control* 1997;8(1):39-47.
16. Bassett JK, Severi G, Baglietto L, et al. Weight change and prostate cancer incidence and mortality. *Int J Cancer* 2012;131(7):1711-1719.
17. Chamberlain C, Romundstad P, Vatten L, et al. The association of weight gain during adulthood with prostate cancer incidence and survival: a population-based cohort. *Int J Cancer* 2011;129(5):1199-1206.
18. Rodriguez C, Freedland SJ, Deka A, et al. Body mass index, weight change, and risk of prostate cancer in the Cancer Prevention Study II Nutrition Cohort. *Cancer Epidemiol Biomarkers Prev* 2007;16(1):63-69.
19. Littman AJ, White E, Kristal AR. Anthropometrics and prostate cancer risk. *Am J Epidemiol* 2007;165(11):1271-1279.
20. Hernandez BY, Park SY, Wilkens LR, et al. Relationship of body mass, height, and weight gain to prostate cancer risk in the multiethnic cohort. *Cancer Epidemiol Biomarkers Prev* 2009;18(9):2413-2421.
21. Wright ME, Chang SC, Schatzkin A, et al. Prospective study of adiposity and weight change in relation to prostate cancer incidence and mortality. *Cancer* 2007;109(4):675-684.
22. Jonsson F, Wolk A, Pedersen NL, et al. Obesity and hormone-dependent tumors: cohort and co-twin control studies based on the Swedish Twin Registry. *Int J Cancer* 2003;106(4):594-599.
23. Giovannucci E, Rimm EB, Stampfer MJ, et al. Height, body weight, and risk of prostate cancer. *Cancer Epidemiol Biomarkers Prev* 1997;6(8):557-563.

24. Aleksandrova K, Pischon T, Buijsse B, et al. Adult weight change and risk of colorectal cancer in the European Prospective Investigation into Cancer and Nutrition. *Eur J Cancer* 2013;49(16):3526-3536.
25. Bassett JK, Severi G, English DR, et al. Body size, weight change, and risk of colon cancer. *Cancer Epidemiol Biomarkers Prev* 2010;19(11):2978-2986.
26. Laake I, Thune I, Selmer R, et al. A prospective study of body mass index, weight change, and risk of cancer in the proximal and distal colon. *Cancer Epidemiol Biomarkers Prev* 2010;19(6):1511-1522.
27. Thygesen LC, Gronbaek M, Johansen C, et al. Prospective weight change and colon cancer risk in male US health professionals. *Int J Cancer* 2008;123(5):1160-1165.
28. Larsson SC, Rutegard J, Bergkvist L, et al. Physical activity, obesity, and risk of colon and rectal cancer in a cohort of Swedish men. *Eur J Cancer* 2006;42(15):2590-2597.
29. Martinez ME, Giovannucci E, Spiegelman D, et al. Leisure-time physical activity, body size, and colon cancer in women. Nurses' Health Study Research Group. *J Natl Cancer Inst* 1997;89(13):948-955.
30. Canchola AJ, Chang ET, Bernstein L, et al. Body size and the risk of endometrial cancer by hormone therapy use in postmenopausal women in the California Teachers Study cohort. *Cancer Causes Control* 2010;21(9):1407-1416.
31. Chang SC, Lacey JV, Jr., Brinton LA, et al. Lifetime weight history and endometrial cancer risk by type of menopausal hormone use in the NIH-AARP diet and health study. *Cancer Epidemiol Biomarkers Prev* 2007;16(4):723-730.
32. Friedenreich C, Cust A, Lahmann PH, et al. Anthropometric factors and risk of endometrial cancer: the European prospective investigation into cancer and nutrition. *Cancer Causes Control* 2007;18(4):399-413.
33. Ma X, Beeghly-Fadiel A, Shu XO, et al. Anthropometric measures and epithelial ovarian cancer risk among Chinese women: results from the Shanghai Women's Health Study. *Br J Cancer* 2013;109(3):751-755.
34. Canchola AJ, Chang ET, Bernstein L, et al. Body size and the risk of ovarian cancer by hormone therapy use in the California Teachers Study cohort. *Cancer Causes Control* 2010;21(12):2241-2248.
35. Schouten LJ, Goldbohm RA, van den Brandt PA. Height, weight, weight change, and ovarian cancer risk in the Netherlands cohort study on diet and cancer. *Am J Epidemiol* 2003;157(5):424-433.
36. Lahmann PH, Cust AE, Friedenreich CM, et al. Anthropometric measures and epithelial ovarian cancer risk in the European Prospective Investigation into Cancer and Nutrition. *Int J Cancer* 2010;126(10):2404-2415.
37. Fairfield KM, Willett WC, Rosner BA, et al. Obesity, weight gain, and ovarian cancer. *Obstet Gynecol* 2002;100(2):288-296.
38. Johansen D, Borgstrom A, Lindkvist B, et al. Different markers of alcohol consumption, smoking and body mass index in relation to risk of pancreatic cancer. A prospective cohort study within the Malmo Preventive Project. *Pancreatology* 2009;9(5):677-686.
39. Luo J, Margolis KL, Adami HO, et al. Obesity and risk of pancreatic cancer among postmenopausal women: the Women's Health Initiative (United States). *Br J Cancer* 2008;99(3):527-531.
40. Patel AV, Rodriguez C, Bernstein L, et al. Obesity, recreational physical activity, and risk of pancreatic cancer in a large U.S. Cohort. *Cancer Epidemiol Biomarkers Prev* 2005;14(2):459-466.
41. Isaksson B, Jonsson F, Pedersen NL, et al. Lifestyle factors and pancreatic cancer risk: a cohort study from the Swedish Twin Registry. *Int J Cancer* 2002;98(3):480-482.
42. Adams KF, Leitzmann MF, Albanes D, et al. Body size and renal cell cancer incidence in a large US cohort study. *Am J Epidemiol* 2008;168(3):268-277.
43. Luo J, Margolis KL, Adami HO, et al. Body size, weight cycling, and risk of renal cell carcinoma among postmenopausal women: the Women's Health Initiative (United States). *Am J Epidemiol* 2007;166(7):752-759.
44. Kitahara CM, Platz EA, Park Y, et al. Body fat distribution, weight change during adulthood, and thyroid cancer risk in the NIH-AARP Diet and Health Study. *Int J Cancer* 2012;130(6):1411-1419.
45. Kabat GC, Kim MY, Thomson CA, et al. Anthropometric factors and physical activity and risk of thyroid cancer in postmenopausal women. *Cancer Causes Control* 2012;23(3):421-430.
46. Iribarren C, Haselkorn T, Tekawa IS, et al. Cohort study of thyroid cancer in a San Francisco Bay area population. *Int J Cancer* 2001;93(5):745-75

Supplementary Table 3. Subgroup analyses of meta-analysis comparing highest and lowest level of adult weight gain

Subgroups	No. of studies	RR (95% CI)	I^2 (%)	$P_{heterogeneity}$	
				Within Subgroup (Q, df)	Between subgroups
Breast Cancer					
By menopausal status at diagnosis					
Pre-menopausal	4	0.99 (0.82, 1.21)	17.1	0.31 (3.62, 3)	0.001
Post-menopausal (among no/low HRT users)	7	1.75 (1.54, 2.00)	0	0.55 (4.94, 6)	
By HRT use (among post-menopausal women)					
Users	5	1.14 (1.00, 1.30)	0	0.58 (2.90, 4)	0.002
Non-users	5	1.83 (1.58, 2.13)	0	0.50 (3.36, 4)	
Post-menopausal Breast Cancer (among no/low HRT users)					
All studies	7	1.75 (1.54, 2.00)	0	0.55 (4.94, 6)	--
By inclusion in primary dose-response analysis					
Yes	7	1.75 (1.54, 2.00)	0	0.55 (4.94, 6)	--
No	0	--	--	--	
By geographical location					
USA	4	1.92 (1.62, 2.27)	0	0.59 (1.91, 3)	0.16
Europe	2	1.50 (1.20, 1.88)	0	0.93 (0.01, 1)	
Asia	1	1.55 (0.70, 3.44)	--	--	
By mean age at baseline					
>55 years	5	1.70 (1.44, 2.00)	0	0.54 (3.09, 4)	0.59
≤55 years	2	1.79 (1.32, 2.44)	31.1	0.23 (1.45, 1)	
By age at early weight assessment					
18-25 years	7	1.75 (1.54, 2.00)	0	0.55 (4.94, 6)	--
>25 years	0	--	--	--	
By No. of total cases					
≥500	4	1.88 (1.61, 2.20)	0	0.54 (2.17, 3)	0.16
<500	3	1.47 (1.16, 1.88)	0	0.97 (0.06, 2)	
By duration of follow-up					

≥10	3	1.74 (1.43, 2.13)	8.8	0.33 (2.19, 2)	0.97
<10	4	1.75 (1.45, 2.12)	0	0.43 (2.75, 3)	
By methods of weight (early, later) assessments					
Both measured	1	1.49 (1.11, 2.01)	--	--	0.18
Measured at least later weight	1	1.52 (1.08, 2.14)	--	--	
Both self-reported	5	1.90 (1.61, 2.24)	0	0.71 (2.17, 4)	
By validation of later weight*					
Validated	5	1.67 (1.43, 1.95)	0	0.52 (3.21, 4)	0.29
Not validated	2	2.01 (1.55, 2.59)		0.62 (0.25, 1)	
By update of adult weight change					
Yes	2	1.75 (1.32, 2.44)	31.1	0.23 (1.45, 1)	0.59
No	5	1.70 (1.44, 2.00)	0	0.54 (3.09, 4)	
By adjustment for confounders:					
Early weight or BMI					
Yes	6	1.70 (1.47, 1.96)	0	0.62 (3.43, 5)	0.29
No	1	2.13 (1.50, 3.02)	--	--	
Later weight or BMI					
Yes	1	2.13 (1.50, 3.02)	--	--	0.29
No	6	1.70 (1.47, 1.96)	0	0.62 (3.43, 5)	
Height					
Yes	6	1.78 (1.55, 2.04)	0	0.53 (4.14, 5)	0.42
No	1	1.40 (0.84, 2.33)	--	--	
Physical activity					
Yes	6	1.67 (1.43, 1.95)	0	0.61 (3.59, 5)	0.30
No	1	1.98 (1.55, 2.53)	--	--	
Alcohol					
Yes	6	1.78 (1.55, 2.04)	0	0.53 (4.14, 5)	0.42
No	1	1.40 (0.84, 2.33)	--	--	
Smoking					
Yes	4	1.59 (1.32, 1.92)	0	0.81 (0.98, 3)	0.21
No	3	1.93 (1.60, 2.33)	0	0.39 (1.88, 2)	
Family history of breast cancer					

Yes	5	1.90 (1.61, 2.24)	0	0.71 (2.17, 4)	0.16
No	2	1.50 (1.20, 1.88)	0	0.93 (0.01, 1)	
HRT use					
Yes	6	1.82 (1.57, 2.11)	0	0.62 (3.52, 5)	0.29
No	1	1.49 (1.11, 2.01)	--	--	
OC use					
Yes	2	1.80 (1.29, 2.50)	45.9	0.17 (1.85, 1)	0.81
No	5	1.74 (1.48, 2.03)	0	0.55 (3.04, 4)	
Prostate Cancer					
All studies	8	0.98 (0.91, 1.06)	31.1	0.18 (10.16, 7)	--
By inclusion in dose-response analysis					
Yes	4	0.95 (0.82, 1.09)	56.2	0.01 (6.84, 3)	0.38
No	4	1.02 (0.95, 1.10)	0	0.75 (1.22, 3)	
By stage at diagnosis					
Localized	6	0.96 (0.89, 1.04)	33.7	0.18 (7.54, 5)	0.29
Aggressive	7	1.06 (0.92, 1.21)	0	0.55 (4.99, 6)	
By geographical location					
USA	5	0.95 (0.86, 1.04)	48.6	0.10 (7.79, 4)	0.22
Europe	3	1.08 (0.94, 1.25)	0	0.87 (0.27, 2)	
By mean age at baseline					
>55 years	7	0.98 (0.90, 1.06)	40.6	0.12 (10.09, 6)	0.79
≤55 years	1	1.02 (0.78, 1.33)	--	--	
By age at early weight assessment					
18-25 years	7	1.01 (0.95, 1.08)	7.0	0.37 (6.45, 6)	0.11
>25 years	1	0.89 (0.79, 1.00)	--	--	
By No. of total cases					
≥500	7	0.98 (0.90, 1.06)	39.7	0.13 (9.95, 6)	0.66
<500	1	1.10 (0.69, 1.76)	--	--	
By duration of follow-up					
≥10	5	1.00 (0.92, 1.09)	30.2	0.22 (5.73, 4)	0.40
<10	3	0.92 (0.77, 1.09)	46.0	0.16 (3.70, 2)	
By methods of weight (early, later) assessments					

Both measured	1	1.02 (0.78, 1.33)	--	--	0.37
Measured at least later weight	1	1.11 (0.93, 1.32)	--	--	
Both self-reported	6	0.96 (0.87, 1.04)	38.0	0.15 (8.06, 5)	
By validation of later weight*					
Validated	4	1.03 (0.94, 1.14)	0	0.59 (1.92, 3)	0.35
Not validated	4	0.94 (0.82, 1.07)	57.4	0.07 (7.05, 3)	
By update of adult weight change					
Yes	2	0.89 (0.80, 0.99)	0	1.00 (0, 1)	0.07
No	6	1.02 (0.95, 1.10)	7.6	0.37 (5.41, 5)	
By adjustments for confounders:					
Early weight or BMI					
Yes	6	1.00 (0.93, 1.07)	24.3	0.25 (6.61, 5)	0.34
No	2	0.89 (0.67, 1.17)	53.6	0.14 (2.16, 1)	
Later weight or BMI					
Yes	3	0.92 (0.74, 1.14)	30.1	0.24 (2.86, 2)	0.47
No	5	0.99 (0.92, 1.08)	37.8	0.17 (6.44, 4)	
Height					
Yes	5	1.00 (0.93, 1.08)	30.0	0.22 (5.72, 4)	0.19
No	3	0.86 (0.72, 1.02)	0	0.41 (1.78, 2)	
Physical activity					
Yes	2	0.91 (0.82, 1.01)	0	0.36 (0.84, 1)	0.18
No	6	1.01 (0.93, 1.09)	22.5	0.27 (6.45, 5)	
Alcohol					
Yes	8	0.98 (0.91, 1.06)	31.1	0.18 (10.16, 7)	--
No	0	--	--	--	
Smoking					
Yes	4	0.99 (0.91, 1.07)	28.9	0.24 (4.22, 3)	0.80
No	4	0.89 (0.69, 1.15)	49.2	0.12 (5.91, 3)	
Family history of prostate cancer					
Yes	4	0.95 (0.85, 1.06)	59.2	0.06 (7.36, 3)	0.43
No	4	1.04 (0.92, 1.17)	0	0.58 (1.99, 3)	

Colon Cancer (men)					
All studies	5	1.33 (1.09, 1.63)	0	0.92 (0.94, 4)	--
By inclusion in dose-response analysis					
Yes	4	1.42 (1.11, 1.81)	0	0.99 (0.12, 3)	0.43
No	1	1.16 (0.81, 1.66)	--	--	
By geographical location					
USA	1	1.41 (0.83, 2.40)	--	--	0.83
Europe	4	1.32 (1.06, 1.63)	0	0.83 (0.88, 3)	
By mean age at baseline					
>55 years	3	1.30 (1.02, 1.66)	0	0.68 (0.77, 2)	0.79
≤55 years	2	1.39 (0.98, 1.96)	0	0.78 (0.08, 1)	
By age at early weight assessment					
18-25 years	4	1.30 (1.04, 1.63)	0	0.86 (0.77, 3)	
>25 years	1	1.45 (0.91, 2.31)	--	--	
By no. of total cases					
≥500	3	1.40 (1.05, 1.87)	0	0.95 (0.11, 2)	0.64
<500	2	1.26 (0.95, 1.67)	0	0.46 (0.56, 1)	
By duration of follow-up					
≥10	4	1.42 (1.11, 1.81)	0	0.99 (0.12, 3)	0.43
<10	1	1.16 (0.81, 1.66)	--	--	
By methods of weight (early, later) assessments					
Both measured	1	1.45 (0.91, 2.31)	--	--	0.47
Measured at least later weight	3	1.40 (1.05, 1.87)	0	0.95 (0.11, 2)	
Both self-reported	1	1.16 (0.81, 1.66)	--	--	
By validation of later weight*					
Validated	5	1.33 (1.09, 1.63)	0	0.92 (0.94, 4)	--
Not validated	0	--	--	--	
By update of adult weight change					
Yes	2	1.43 (1.01, 2.03)	0	0.94 (0.01, 1)	0.64
No	3	1.28 (1.00, 1.64)	0	0.72 (0.67, 2)	
By adjustment for confounders:					
Early weight or BMI					
Yes	4	1.42 (1.11, 1.81)	0	0.99 (0.12, 3)	0.43

No	1	1.16 (0.81, 1.66)	--	--	
Later weight or BMI					
Yes	0	--	--	--	--
No	5	1.33 (1.09, 1.63)	0	0.92 (0.94, 4)	
Height					
Yes	3	1.32 (1.04, 1.67)	0	0.64 (0.88, 2)	0.90
No	2	1.36 (0.94, 1.97)	0	0.85 (0.04, 1)	
Physical activity					
Yes	5	1.33 (1.09, 1.63)	0	0.92 (0.94, 4)	--
No	0	--	--	--	
Alcohol					
Yes	3	1.40 (1.05, 1.87)	0	0.95 (0.11, 2)	0.64
No	2	1.26 (0.95, 1.67)	0	0.46 (0.56, 1)	
Smoking					
Yes	5	1.33 (1.09, 1.63)	0	0.92 (0.94, 4)	--
No	0	--	--	--	
Family history of colorectal cancer					
Yes	2	1.23 (0.92, 1.66)	0	0.55 (0.36, 1)	0.55
No	3	1.42 (1.08, 1.86)	0	0.94 (0.12, 2)	
Colon Cancer (women)					
All studies	4	1.13 (0.93, 1.38)	0	0.57 (2.03, 3)	--
By inclusion in dose-response analysis					
Yes	3	1.17 (0.90, 1.51)	0	0.39 (1.89, 2)	0.74
No	1	1.08 (0.79, 1.48)	--	--	
By geographical location					
USA	3	1.17 (0.90, 1.51)	0	0.39 (1.89, 2)	0.74
Europe	1	1.08 (0.79, 1.48)	--	--	
By mean age at baseline					
>55 years	1	0.96 (0.64, 1.44)	--	--	0.46
≤55 years	3	1.19 (0.95, 1.49)	0	0.55 (1.20, 2)	
By age at early weight assessment					
18-25 years	3	1.12 (0.89, 1.39)	0	0.38 (1.94, 2)	0.80
>25 years	1	1.20 (0.77, 1.88)	--	--	

By No. of total cases					
≥500	2	1.17 (0.76, 1.80)	46.4	0.17 (1.86, 1)	0.90
<500	2	1.12 (0.87, 1.45)	0	0.71 (0.14, 1)	
By duration of follow-up					
≥10	4	1.13 (0.93, 1.38)	0	0.57 (2.03, 3)	--
<10	0	--	--	--	
By methods of weight (early, later) assessments					
Both measured	1	1.20 (0.77, 1.88)	--	--	0.73
Measured at least later weight	2	1.17 (0.76, 1.80)	46.4	0.17 (1.86, 1)	
Both self-reported	1	1.08 (0.79, 1.48)	--	--	
By validation of later weight*					
Validated	4	1.13 (0.93, 1.38)	0	0.57 (2.03, 3)	--
Not validated	0	--	--	--	
By update of adult weight change					
Yes	2	1.12 (0.87, 1.45)	0	0.71 (0.14, 1)	0.90
No	2	1.17 (0.76, 1.80)	46.4	0.17 (1.86, 1)	
By adjustment for confounders:					
Early weight or BMI					
Yes	4	1.13 (0.93, 1.38)	0	0.57 (2.03, 3)	--
No	0	--	--	--	
Later weight or BMI					
Yes	0	--	--	--	--
No	4	1.13 (0.93, 1.38)	0	0.57 (2.03, 3)	
Height					
Yes	2	1.06 (0.79, 1.43)	0	0.47 (0.53, 1)	0.64
No	2	1.20 (0.89, 1.62)	16.5	0.27 (1.20, 1)	
Physical activity					
Yes	3	1.17 (0.90, 1.51)	0	0.39 (1.89, 2)	0.74
No	1	1.08 (0.79, 1.48)	--	--	
Alcohol					
Yes	3	1.12 (0.89, 1.39)	0	0.38 (1.94, 2)	0.80
No	1	1.20 (0.77, 1.88)	--	--	
Smoking					
Yes	4	1.13 (0.93, 1.38)	0	0.57	--

				(2.03, 3)	
No	0	--	--	--	
Family history of colorectal cancer					
Yes	1	1.08 (0.79, 1.48)	--	--	0.74
No	3	1.17 (0.90, 1.51)	0	0.39 (1.89, 2)	
Endometrial Cancer					
By menopausal status at diagnosis					
Pre-menopausal	0	--	--	--	0.10
Post-menopausal (among no/low HRT users)	2	4.50 (2.94, 6.89)	0	0.41 (0.67, 1)	
Combined	2	1.91 (1.29, 2.84)	0	0.45 (0.58, 1)	
Post-menopausal endometrial cancer (among no/low HRT users)					
All studies	2	4.50 (2.94, 6.89)	0	0.41 (0.67, 1)	--
By inclusion in dose-response analysis					
Yes	2	4.50 (2.94, 6.89)	0	0.41 (0.67, 1)	--
No	0	--	--	--	
Ovarian Cancer					
By menopausal status at diagnosis					
Pre-menopausal	1	1.48 (0.57, 3.85)	79.4	0.03 (4.86, 1)	0.86
Post-menopausal	4	1.27 (0.88, 1.84)	29.4	0.24 (4.25, 3)	
Combined	2	1.48 (0.59, 3.67)	0	--	
Post-menopausal ovarian cancer (among no/low HRT users)					
All studies	2	1.99 (1.39, 2.84)	0	0.76 (0.54, 2)	--
By inclusion in dose-response analysis					
Yes	2	1.99 (1.39, 2.84)	0	0.76 (0.54, 2)	--
No	0	--	--	--	--
Pancreatic Cancer					
All studies	4	1.04 (0.85, 1.26)	0	0.48 (2.46, 3)	--
By inclusion in dose-response analysis					
Yes	2	1.16 (0.77, 1.75)	29.5	0.23 (1.42, 1)	0.54
No	2	0.99 (0.78, 1.25)	0	0.48 (0.51, 1)	
By sex					
Men	1	1.59 (0.82, 3.08)	--	--	0.38
Women	2	0.73 (0.42, 1.27)	54.7	0.14 (2.21, 1)	
By geographical location					

USA	2	1.17 (0.89, 1.54)	0	0.32 (0.99, 1)	0.36
Europe	2	0.92 (0.70, 1.21)	0	0.83 (0.05, 1)	
By mean age at baseline					
>55 years	3	1.03 (0.79, 1.35)	17.1	0.30 (2.41, 2)	0.87
≤55 years	1	1.07 (0.77, 1.48)	--	--	
By age at early weight assessment					
18-25 years	3	1.11 (0.88, 1.41)	0	0.47 (1.51, 2)	0.43
>25 years	1	0.90 (0.64, 1.27)	--	--	
By No. of total cases					
≥500	0	--	--	--	--
<500	4	1.04 (0.85, 1.26)	0	0.48 (2.46, 3)	
By duration of follow-up					
≥10	2	1.17 (0.89, 1.54)	0	0.32 (0.99, 1)	0.36
<10	2	0.92 (0.70, 1.21)	0	0.83 (0.05, 1)	
By methods of weight (early, later) assessments					
Both measured	0	--	--	--	0.54
Measured at least later weight	2	0.99 (0.78, 1.25)	0	0.48 (0.51, 1)	
Both self-reported	2	1.16 (0.77, 1.75)	29.5	0.23 (1.42, 1)	
By validation of later weight*					
Validated	1	1.07 (0.77, 1.48)	--	--	0.87
Not validated	3	1.03 (0.79, 1.35)	17.1	0.30 (2.41, 2)	
By update of adult weight change					
Yes	0	--	--	--	--
No	4	1.04 (0.85, 1.26)	0	0.48 (2.46, 3)	
By adjustment for confounders:					
Early weight or BMI					
Yes	1	0.96 (0.61, 1.52)	--	--	0.76
No	3	1.06 (0.84, 1.35)	14.1	0.31 (2.33, 2)	
Later weight or BMI					
Yes	1	1.07 (0.77, 1.48)	--	--	0.87
No	3	1.03 (0.79, 1.35)	17.1	0.30 (2.41, 2)	
Height					
Yes	1	0.96 (0.61, 1.52)	--	--	0.76
No	3	1.06 (0.84, 1.35)	14.1	0.31	

				(2.33, 2)	
Physical activity					
Yes	1	0.96 (0.61, 1.52)	--	--	0.76
No	3	1.06 (0.84, 1.35)	14.1	0.31 (2.33, 2)	
Alcohol					
Yes	2	1.03 (0.79, 1.35)	0	0.71 (0.14, 1)	0.92
No	2	1.10 (0.69, 1.76)	56.8	0.13 (2.32, 1)	
Smoking					
Yes	4	1.04 (0.85, 1.26)	0	0.48 (2.46, 3)	--
No	0	--	--	--	
Family history of colorectal cancer					
Yes	1	0.96 (0.61, 1.52)	--	--	0.76
No	3	1.06 (0.84, 1.35)	14.1	0.31 (2.33, 2)	
History of diabetes					
Yes	2	0.92 (0.70, 1.21)	0	0.83 (0.05, 1)	0.36
No	2	1.17 (0.89, 1.54)	0	0.32 (0.99, 1)	
Kidney Cancer					
All studies	2‡	1.42 (1.11, 1.81)	9.3	0.33 (2.21, 2)	--
By inclusion in dose-response analysis					
Yes	0	--	--	--	--
No	2‡	1.42 (1.11, 1.81)	9.3	0.33 (2.21, 2)	--
By sex					
Men	1	1.71 (1.21, 2.41)	--	--	0.39
Women	2	1.23 (0.91, 1.66)	0.0	0.65 (0.20, 1)	
Thyroid Cancer					
All studies	3§	1.06 (0.82, 1.38)	0.0	0.42 (2.85, 3)	--
By inclusion in dose-response analysis					
Yes	0	--	--	--	--
No	3§	1.06 (0.82, 1.38)	0.0	0.42 (2.85, 3)	--
By sex					
Men	1	1.75 (0.89, 3.44)	--	--	0.41
Women	2	1.05 (0.73, 1.51)	0.0	0.0 (0.04, 1)	

* Measured weight was classified as validated.

† One study (See Supplementary Table 2, Larsson et al. 2006) used colorectal cancer as an outcome.
‡ One study (See Supplementary Table 2, Adams et al. 2008) provided data for men and women separately and thus, three results were pooled.
§ One study (See Supplementary Table 2, Kitahara et al. 2012) provided data for men and women separately and thus, four results were pooled.
|| The *P* values for the within-subgroup heterogeneity were calculated from the Cochran's Q test and the *P* values for the between-subgroup heterogeneity were calculated using meta-regression comparing the model including the stratification variable as explanatory variable with the null model without any explanatory variables; all statistical tests were two-sided.
¶ BMI = body mass index; CI = confidence interval; HRT = hormone replacement therapy; No. = number; RR = relative risk.