

Supplementary Material for

Risk of breast cancer in men in relation to weight change: a national case-control study in England and Wales

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Supplementary tables 1-6

Suppl. Table 1 Risk of breast cancer in men in relation to change in relative fatness/body mass index from ages 11-20, 20-40 and 40-60 years, adjusted for baseline fatness/BMI

	Cases No.	Controls No.	OR ^a	95% CI	P	
Change in relative fatness, age 11 to 20^b						
<0	366	357	0.81	0.66-0.99	0.04	
0	865	736	1.00	Baseline	.	
1	475	350	1.22	1.00-1.48	0.05	
≥2	102	53	1.74	1.15-2.63	0.008	
Not known	178	101	1.41	1.06-1.88	0.02	
Trend ^b			1.23	1.10-1.37	< 0.001	z = 3.58
Change in BMI, age 20 to 40						
<0	65	44	1.12	0.71-1.77	0.63	
0	390	312	1.00	Baseline	.	
1-2	539	527	0.89	0.72-1.10	0.28	
3-4	392	309	1.13	0.90-1.43	0.29	
≥5	366	214	1.42	1.10-1.82	0.007	
Not known	199	107	1.20	0.52-2.77	0.67	
Not yet age 40	47	84				
Trend ^c			1.13	1.07-1.20	< 0.001	z = 4.37
Change in BMI, age 40 to 60						
<0	135	115	0.80	0.58-1.12	0.19	
0	438	362	1.00	Baseline	.	
1-2	397	352	1.02	0.82-1.27	0.89	
3-4	189	144	1.07	0.81-1.43	0.63	
≥5	156	64	1.89	1.32-2.71	<0.001	
Not known	92	45	1.95	0.66-5.77	0.23	
Not yet age 60	591	515				
Trend ^c			1.14	1.06-1.23	< 0.001	z = 3.57

OR = Odds ratio; CI = Confidence interval; BMI = Body mass index, Kg/m²

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Fatness at age 11 in 5 categories of comparison with peers. BMI at age 20 was split into categories with the percentile cut-offs between the categories matching those for controls at age 11. The change values represent moves between these categories, rather than a numerical change in BMI. Linear trend excludes 'Not known' category and is per unit increase in category.

^c Linear trend excludes 'Not known' category, and is per 2 unit increase in BMI (i.e. per 1 category in the table).

Suppl. Table 2 Risk of breast cancer in men in relation to change in waist/height ratio from age 20 to 5 years before interview, adjusted for waist/height ratio at age 20

	Cases No.	Controls No.	OR^a	95% CI	P	
Change in waist/height ratio, age 20 to 5 years before interview						
<0.00	25	22	0.83	0.41-1.67	0.60	
0.00	150	143	1.00	Baseline	.	
0.01-0.03	360	350	1.17	0.87-1.58	0.30	
0.04-0.06	394	389	1.20	0.89-1.62	0.24	
0.07-0.09	260	224	1.35	0.97-1.87	0.08	
≥0.10	371	192	1.95	1.40-2.72	<0.001	
Not known	438	277	1.26	0.71-2.25	0.43	
Trend^b			1.16	1.10-1.23	<0.001	<i>z</i> = 5.55

OR = Odds ratio

CI = Confidence interval

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Linear trend, excluding 'Not known' category, per 0.03 units increase in waist to height ratio (i.e. per 1 category increase in the table).

Suppl. Table 3 Risk of invasive, and of in situ, breast cancer in men in relation to change in relative fatness/body mass index from ages 11-20, 20-40, 40-60 years

	Invasive					In situ					
	Cases No.	Controls No.	OR ^a	95% CI	P	Cases No.	Controls No.	OR ^a	95% CI	P	
Change in relative fatness, age 11 to 20^b											
<0	343	357	0.87	0.71-1.05	0.15	23	357	0.67	0.41-1.11	0.12	
0	732	736	1.00	Baseline	.	72	736	1.00	Baseline	.	
1	475	350	1.18	0.98-1.43	0.08	38	350	1.07	0.70-1.65	0.75	
≥2	91	53	1.61	1.11-2.36	0.01	11	53	2.16	1.04-4.49	0.04	
Not known	174	101	1.48	1.10-1.97	0.009	16	101	1.51	0.82-2.81	0.19	
Trend ^b			1.18	1.07-1.29	< 0.001	z = 3.51		1.29	1.04-1.61	0.02	z = 2.35
P interaction in trends invasive/in situ ^d											0.34
Change in BMI, age 20 to 40											
<0	58	44	1.22	0.77-1.94	0.39	7	44	2.31	0.90-5.93	0.08	
0	366	312	1.00	Baseline	.	24	312	1.00	Baseline	.	
1-2	494	527	0.86	0.70-1.06	0.17	45	527	1.04	0.61-1.79	0.89	
3-4	360	309	1.08	0.85-1.36	0.54	32	309	1.35	0.76-2.41	0.30	
≥5	337	214	1.35	1.05-1.73	0.02	29	214	1.40	0.76-2.59	0.28	
Not known	183	107	1.40	1.03-1.90	0.03	16	107	1.59	0.78-3.27	0.21	
Not yet age 40	40	84				7	84				
Trend ^c			1.11	1.05-1.18	< 0.001	z = 3.81		1.06	0.92-1.21	0.42	z = 0.81
P interaction in trends invasive/in situ ^d											0.68

OR = Odds ratio; CI = Confidence interval; BMI = Body mass index, Kg/m²

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Fatness at age 11 in 5 categories of comparison with peers. BMI at age 20 was split into categories with the percentile cut-offs between the categories matching those for controls at age 11. The change values represent moves between these categories, rather than a numerical change in BMI. Linear trend excludes 'Not known' category and is per unit increase in category.

^c Linear trend excludes 'Not known' category, and is per 2 unit increase in BMI (i.e. per 1 category in the table).

^d From case-case analyses.

(Contd.) Suppl. Table 3 Risk of invasive, and of in situ, breast cancer in men in relation to change in relative fatness/body mass index from ages 11-20, 20-40, 40-60 years

	Invasive					In situ					
	Cases No.	Controls No.	OR ^a	95% CI	P	Cases No.	Controls No.	OR ^a	95% CI	P	
Change in BMI, age 40 to 60											
<0	122	115	0.90	0.66-1.25	0.54	13	115	1.69	0.78-3.65	0.18	
0	415	362	1.00	Baseline	.	23	362	1.00	Baseline	.	
1-2	373	352	1.00	0.81-1.26	0.97	24	352	1.14	0.61-2.13	0.67	
3-4	177	144	1.10	0.83-1.47	0.52	12	144	1.40	0.65-3.00	0.39	
≥5	144	64	1.91	1.33-2.74	<0.001	12	64	3.09	1.38-6.93	0.006	
Not known	85	45	1.33	0.86-2.06	0.10	7	45	2.40	0.90-6.37	0.08	
Not yet age 60	522	515				69	515				
Trend ^c			1.10	1.02-1.18	0.01	<i>z</i> = 2.61		1.09	0.90-1.32	0.21	<i>z</i> = 0.89
P interaction in trends invasive/in situ ^d						0.65					

OR = Odds ratio; CI = Confidence interval; BMI = Body mass index, Kg/m²

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Fatness at age 11 in 5 categories of comparison with peers. BMI at age 20 was split into categories with the percentile cut-offs between the categories matching those for controls at age 11. The change values represent moves between these categories, rather than a numerical change in BMI. Linear trend excludes 'Not known' category and is per unit increase in category.

^c Linear trend excludes 'Not known' category, and is per 2 unit increase in BMI (i.e. per 1 category in the table).

^d From case-case analyses.

Suppl. Table 4 Risk of invasive, and of in situ, breast cancer in men in relation to change in waist/height ratio from age 20 to 5 years before interview

	Invasive					In situ					
	Cases No.	Controls No.	OR ^a	95% CI	P	Cases No.	Controls No.	OR ^a	95% CI	P	
Change in waist/height ratio, age 20 to 5 years before interview											
<0.00	23	22	0.98	0.49-1.97	0.96	2	22	0.65	0.13-3.23	0.60	
0.00	131	143	1.00	Baseline	.	19	143	1.00	Baseline	.	
0.01-0.03	329	350	1.20	0.88-1.64	0.25	31	350	0.67	0.36-1.27	0.22	
0.04-0.06	367	389	1.21	0.89-1.65	0.22	27	389	0.53	0.28-1.01	0.06	
0.07-0.09	240	224	1.33	0.95-1.86	0.09	20	224	0.78	0.39-1.56	0.48	
≥0.10	336	192	1.83	1.32-2.54	<0.001	35	192	1.54	0.82-2.92	0.18	
Not known	412	277	1.72	1.18-2.49	0.005	26	277	0.67	0.29-1.58	0.36	
Trend ^b			1.13	1.08-1.19	< 0.001	z = 4.80		1.17	1.04-1.31	0.009	z = 2.61
P interaction in trends invasive/in situ ^c											0.57

OR = Odds ratio

CI = Confidence interval

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Linear trend, excluding 'Not known' category, per 0.03 units increase in waist to height ratio (i.e. per 1 category increase in the table).

^c From case-case analyses.

Suppl. Table 5 Risk of breast cancer in men in relation to change in relative fatness/body mass index from ages 11-20, 20-40, 40-60 years, by HER-2 expression status

	HER-2 Positive					HER-2 Negative						
	Cases No.	Controls No.	OR ^a	95% CI	P	Cases No.	Controls No.	OR ^a	95% CI	P		
Change in relative fatness, age 11 to 20^b												
<0	34	357	0.80	0.51-1.25	0.32	262	357	0.88	0.71-1.08	0.23		
0	89	736	1.00	Baseline	.	601	736	1.00	Baseline	.		
1	40	350	0.91	0.59-1.39	0.65	331	350	1.21	0.99-1.48	0.06		
≥2	13	53	2.45	1.22-4.91	0.01	70	53	1.67	1.12-2.49	0.01		
Not known	12	101	1.06	0.52-2.16	0.86	128	101	1.48	1.08-2.01	0.01		
Trend ^b			1.17	0.95-1.44	0.14			1.19	1.08-1.31	< 0.001	z = 1.49	z = 3.52
P interaction in trends HER-2 +ve/-ve ^d											0.84	
Change in BMI, age 20 to 40												
<0	7	44	1.58	0.61-4.09	0.35	48	44	1.24	0.77-2.00	0.38		
0	36	312	1.00	Baseline	.	288	312	1.00	Baseline	.		
1-2	54	527	0.96	0.59-1.57	0.89	356	527	0.80	0.64-1.01	0.06		
3-4	32	309	0.98	0.57-1.70	0.94	282	309	1.09	0.85-1.39	0.51		
≥5	41	214	1.85	1.08-3.18	0.03	250	214	1.26	0.97-1.65	0.09		
Not known	15	107	1.46	0.71-2.97	0.30	137	107	1.34	0.97-1.86	0.08		
Not yet age 40	3	84				31	84					
Trend ^c			1.18	1.04-1.34	0.01			1.11	1.04-1.17	< 0.001	z = 2.58	z = 3.37
P interaction in trends HER-2 +ve/-ve ^d											0.63	

OR = Odds ratio; CI = Confidence interval; BMI = Body mass index, Kg/m²

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Fatness at age 11 in 5 categories of comparison with peers. BMI at age 20 was split into categories with the percentile cut-offs between the categories matching those for controls at age 11. The change values represent moves between these categories, rather than a numerical change in BMI. Linear trend excludes 'Not known' category and is per unit increase in category.

^c Linear trend excludes 'Not known' category, and is per 2 unit increase in BMI (i.e. per 1 category in the table).

^d From case-case analyses.

(Contd.) Suppl. Table 5 Risk of breast cancer in men in relation to change in relative fatness/body mass index from ages 11-20, 20-40, 40-60 years, by HER-2 expression status

	HER-2 Positive					HER-2 Negative					
	Cases No.	Controls No.	OR ^a	95% CI	P	Cases No.	Controls No.	OR ^a	95% CI	P	
Change in BMI, age 40 to 60											
<0	15	115	0.96	0.48-1.90	0.90	91	115	0.92	0.65-1.30	0.63	
0	53	362	1.00	Baseline	.	304	362	1.00	Baseline	.	
1-2	26	352	0.62	0.36-1.06	0.08	290	352	1.05	0.83-1.33	0.68	
3-4	15	144	0.72	0.36-1.43	0.35	143	144	1.22	0.90-1.65	0.19	
≥5	16	64	2.12	1.05-4.27	0.04	113	64	2.05	1.41-2.99	<0.001	
Not known	4	45	0.94	0.31-2.82	0.91	65	45	1.40	0.88-2.22	0.15	
Not yet age 60	59	515				387	515				
Trend ^c			1.00	0.84-1.19	0.98			1.15	1.06-1.24	< 0.001	z = 3.49
P interaction in trends HER-2 +ve/-ve ^d											0.12

OR = Odds ratio; CI = Confidence interval; BMI = Body mass index, Kg/m²

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Fatness at age 11 in 5 categories of comparison with peers. BMI at age 20 was split into categories with the percentile cut-offs between the categories matching those for controls at age 11. The change values represent moves between these categories, rather than a numerical change in BMI. Linear trend excludes 'Not known' category and is per unit increase in category.

^c Linear trend excludes 'Not known' category, and is per 2 unit increase in BMI (i.e. per 1 category in the table).

^d From case-case analyses.

Suppl. Table 6 Risk of breast cancer in men in relation to change in waist/height ratio from age 20 to 5 years before interview, by HER-2 expression status

	HER-2 Positive					HER-2 Negative					
	Cases No.	Controls No.	OR ^a	95% CI	P	Cases No.	Controls No.	OR ^a	95% CI	P	
Change in waist/height ratio, age 20 to 5 years before interview											
<0.00	4	22	1.27	0.36- 4.54	0.71	17	22	1.08	0.51- 2.28	0.85	
0.00	18	143	1.00	Baseline	.	100	143	1.00	Baseline	.	
0.01-0.03	34	350	0.75	0.39- 1.45	0.39	258	350	1.30	0.93- 1.81	0.12	
0.04-0.06	34	389	0.63	0.33- 1.22	0.17	306	389	1.36	0.98- 1.88	0.07	
0.07-0.09	24	224	0.72	0.35- 1.46	0.36	192	224	1.48	1.04- 2.11	0.03	
≥0.10	38	192	1.32	0.68- 2.54	0.41	261	192	1.93	1.36- 2.73	<0.001	
Not known	36	277	1.01	0.45- 2.26	0.98	258	277	1.87	1.26- 2.78	0.002	
Trend ^b			1.08	0.97-1.21	0.16	<i>z</i> = 1.41		1.14	1.08-1.20	< 0.001	<i>z</i> = 4.65
P interaction in trends HER-2 +ve/-ve ^c											0.35

OR = Odds ratio

CI = Confidence interval

^a Adjusted for age, socioeconomic status (Acorn score (CACI, 2019)), region of residence, year of interview and marital status.

^b Linear trend, excluding 'Not known' category, per 0.03 units increase in waist to height ratio (i.e. per 1 category increase in the table).

^c From case-case analyses.