

Epidemiologic evidence – Energy balance-related factors and pre- and postmenopausal breast cancer risk

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No conflict of interest



Analysing research on cancer
prevention and survival

Systematic literature review and meta-analysis of energy balance-related factors and breast cancer risk

- **Searched** in PubMed and reference list of relevant articles up to April 2015
- **Study designs:** Cohorts, case-cohort, and nested case-control, or pooled studies
- **Exposures:**
 - Body mass index (BMI)
 - Waist circumference/ waist-hip-ratio
 - Adult weight gain, from age 18-<30 years to study baseline
 - Physical activity, all types
- **Outcomes:** Risk of pre- and postmenopausal breast cancer incidence in women, overall and by hormone receptor status of the tumour and menopausal hormone therapy use (MHT)

Meta-analysis of energy balance-related factors and breast cancer risk

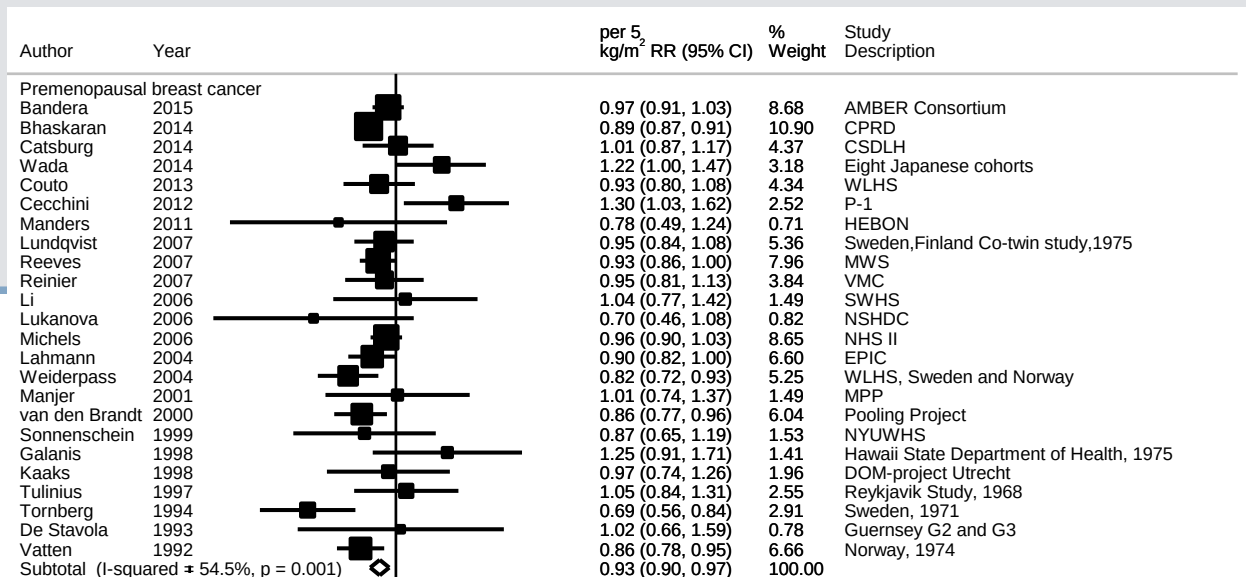
- **Statistical methods:**
 - Dose-response meta-analyses
 - Random-effects models to calculate summary relative risk (SRR)
 - Cochrane Q test and I square
 - Subgroup meta-analyses
 - Egger's test and funnel plot – small study/publication bias
- Overall 127 publications were included in the meta-analyses

Body mass index (BMI)

Premenopausal breast cancer

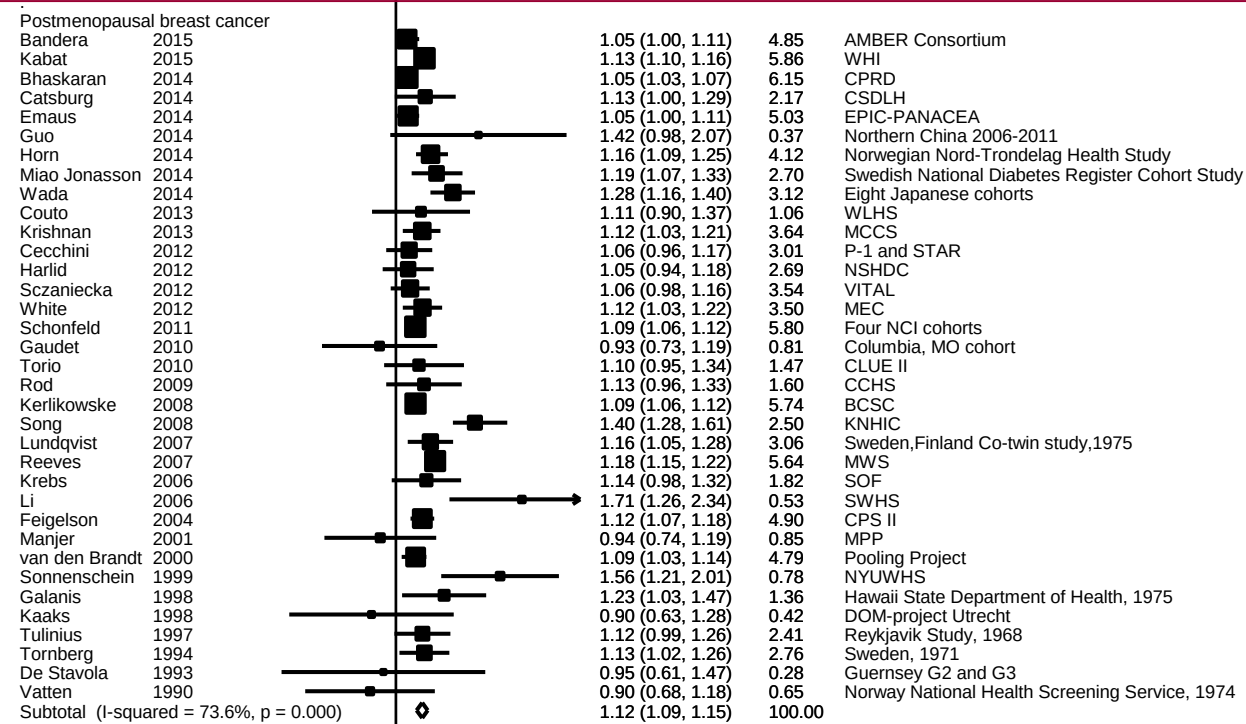
Per 5 kg/m²

SRR: 0.93 (95% CI: 0.90-0.97)



Postmenopausal breast cancer

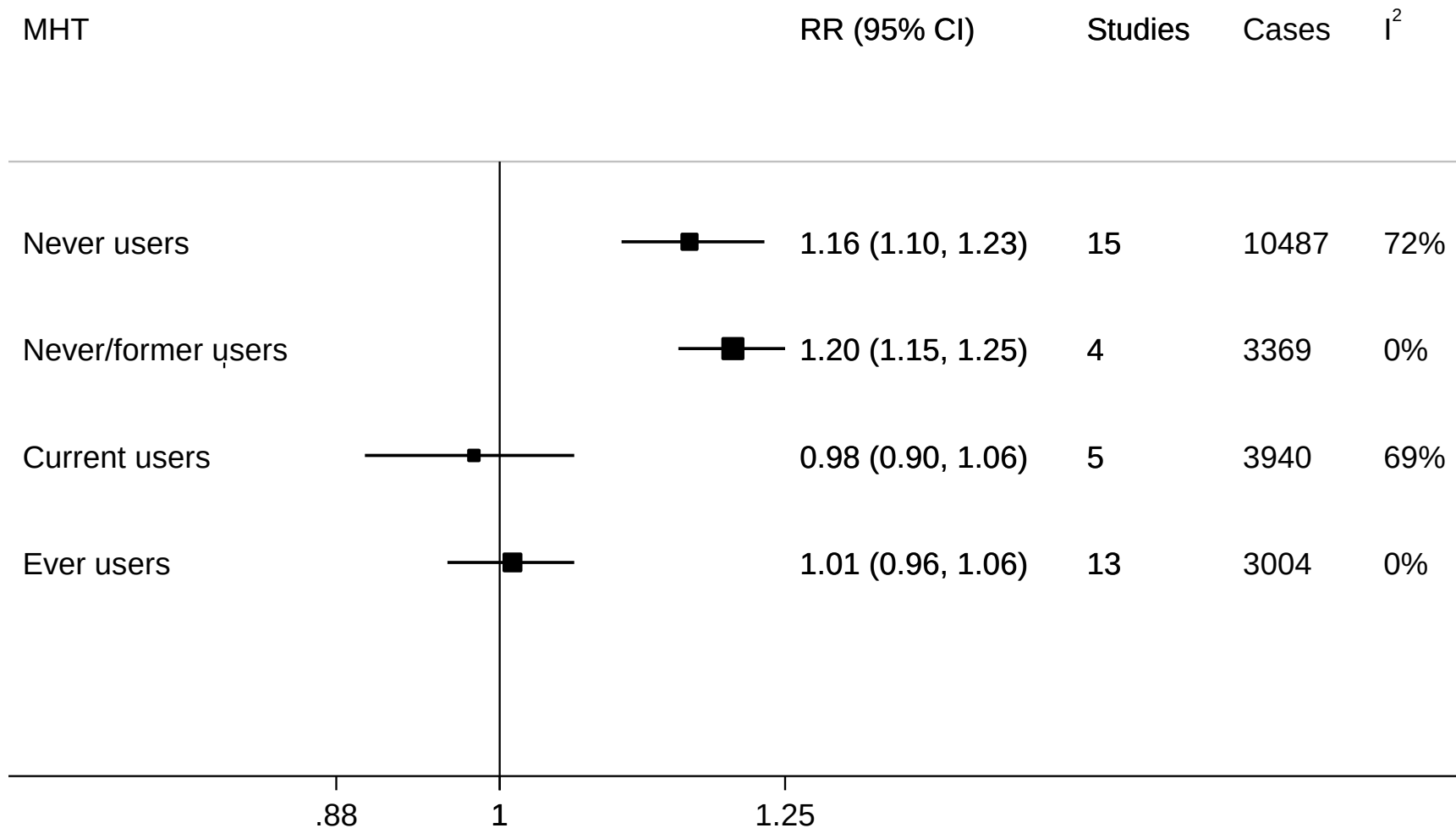
SRR: 1.12 (95% CI: 1.09-1.15)



NOTE: Weights are from random effects analysis

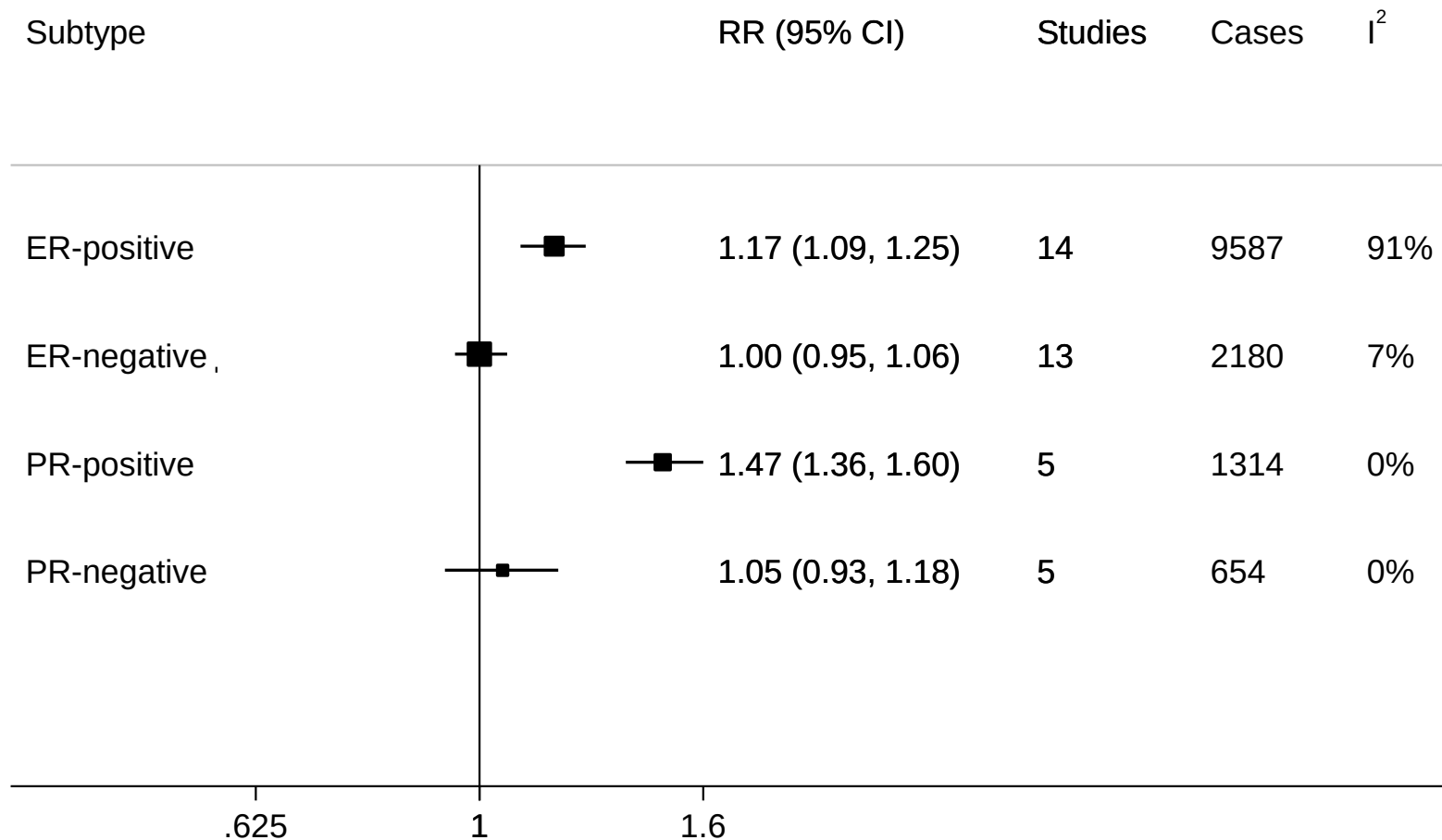
BMI and postmenopausal breast cancer by menopausal hormone therapy use

Summary RRs per 5 kg/m²

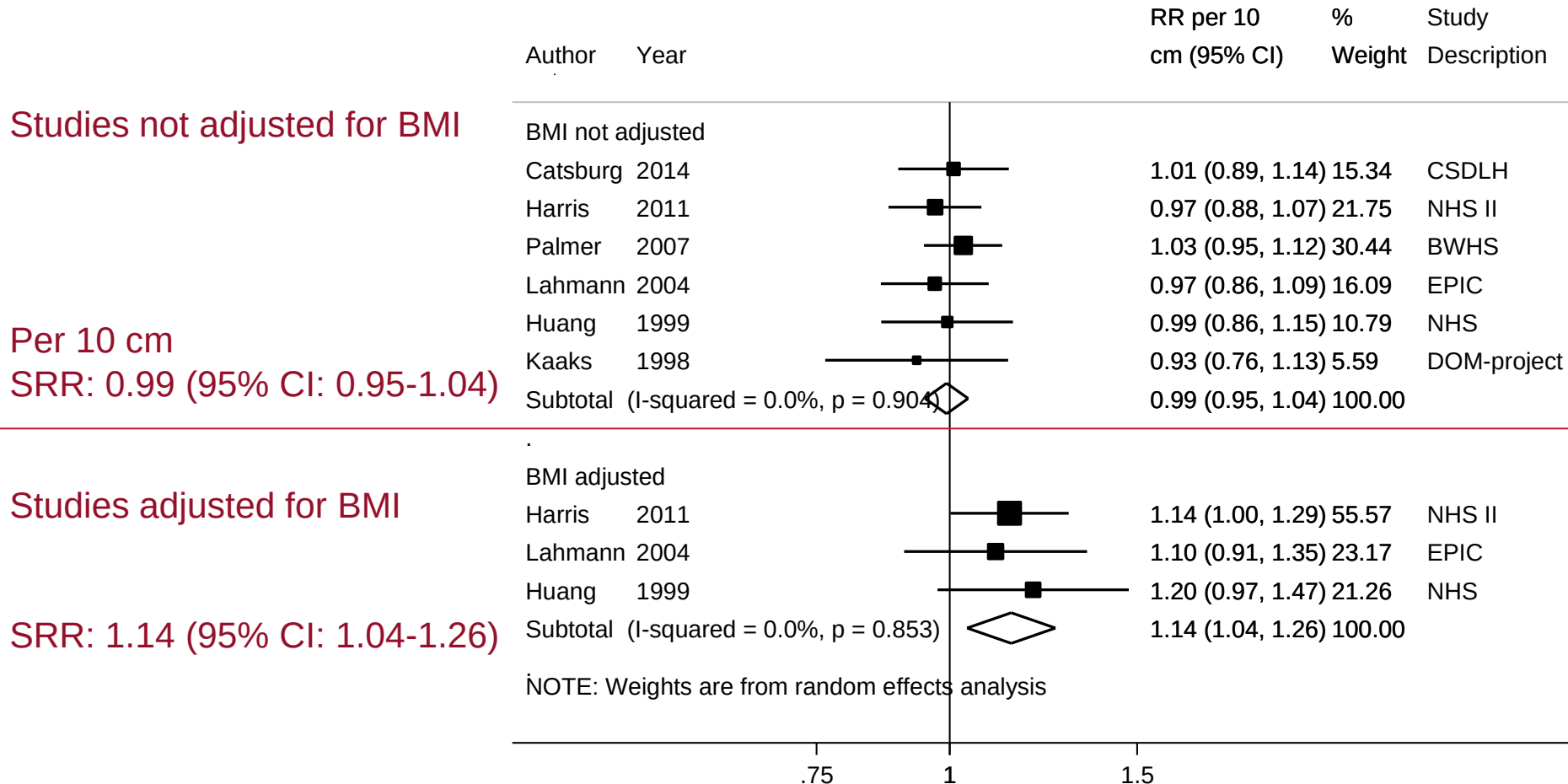


BMI and postmenopausal breast cancer by hormone receptor status

Summary RRs per 5 kg/m²



Waist circumference and premenopausal breast cancer risk

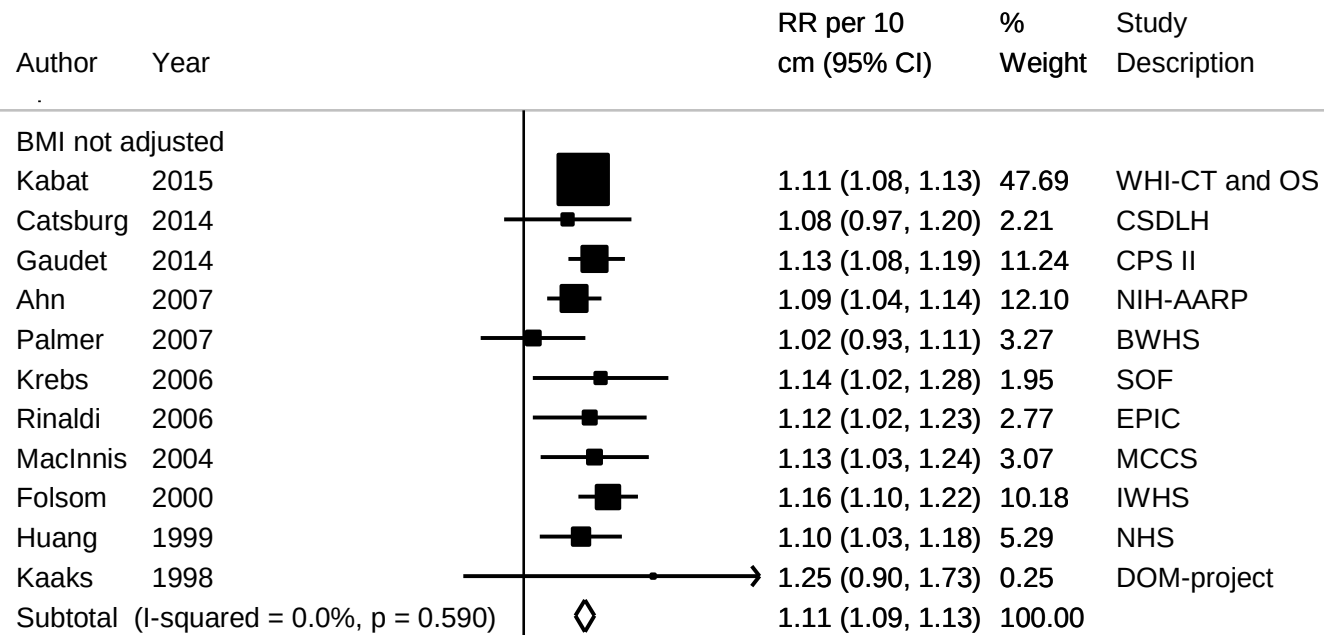


Waist circumference and postmenopausal breast cancer risk

Studies not adjusted for BMI

Per 10 cm

SRR: 1.11 (95% CI: 1.09-1.13)



Studies adjusted for BMI

SRR: 1.06 (95% CI: 1.01-1.12)



NOTE: Weights are from random effects analysis

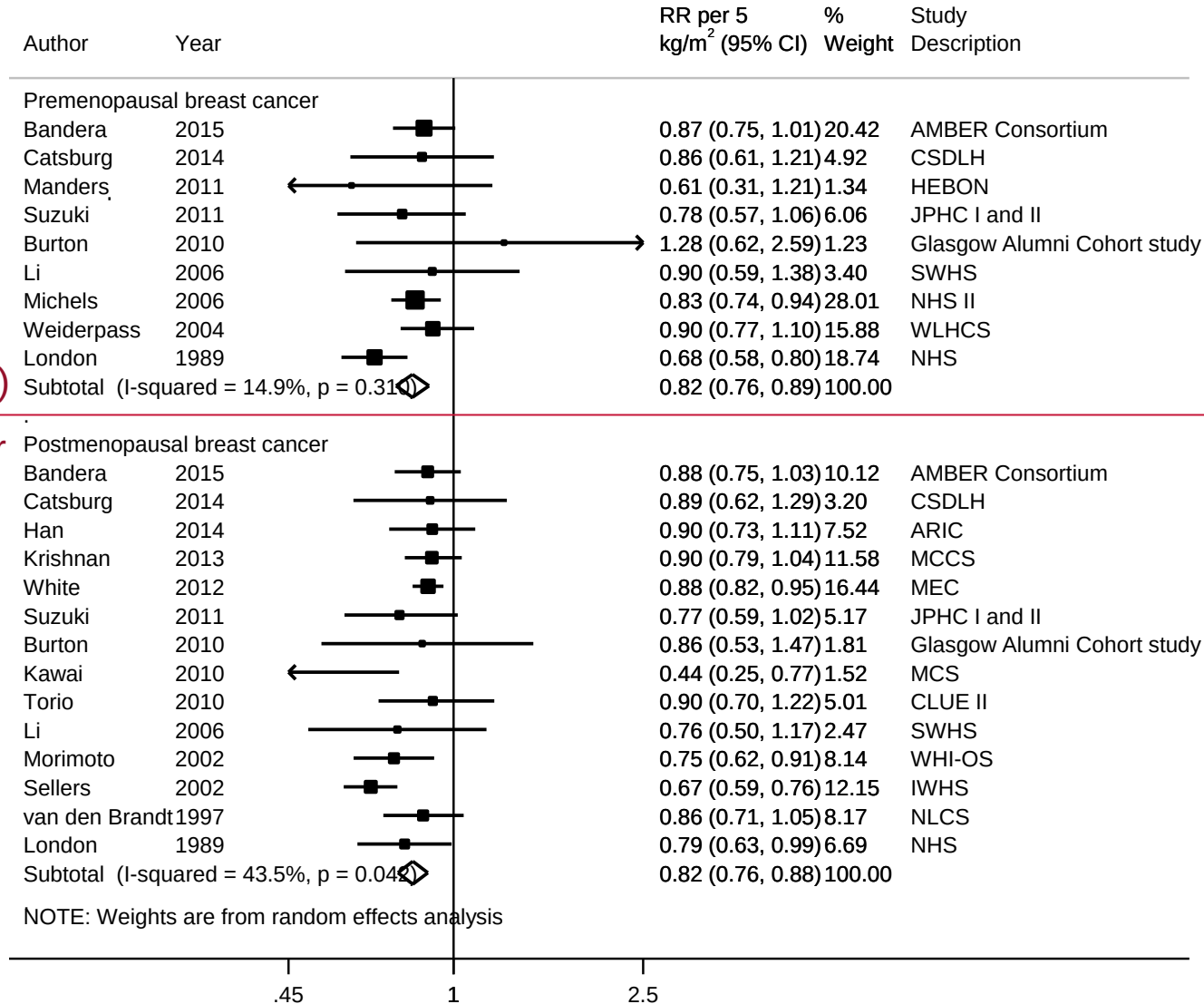
Early adult BMI and pre- and postmenopausal breast cancer risk

Premenopausal breast cancer

Per 5 kg/m²
SRR: 0.82 (95% CI: 0.76-0.89)

Postmenopausal breast cancer

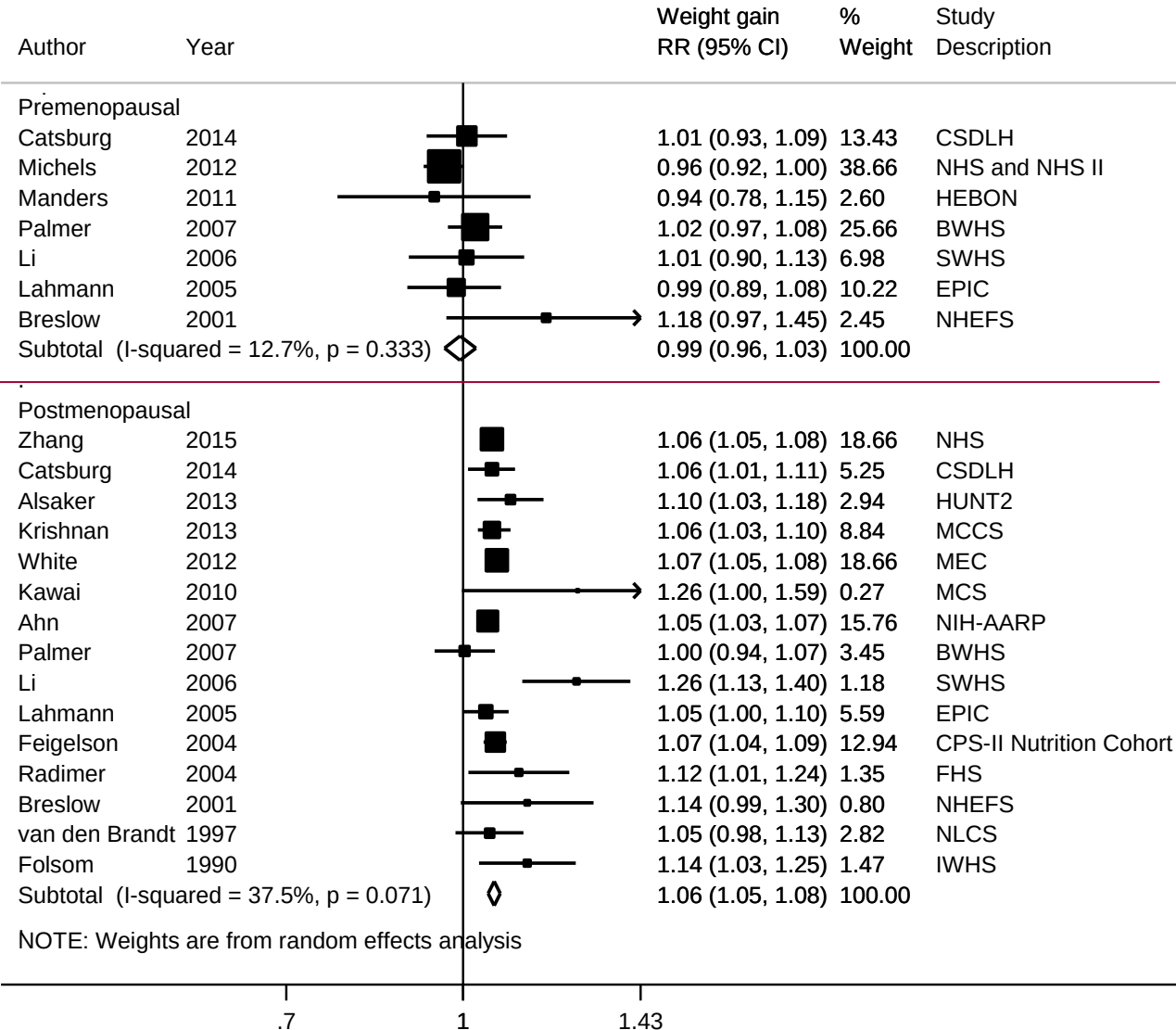
SRR: 0.82 (95% CI: 0.76-0.88)



Adult weight gain and pre- and postmenopausal breast cancer risk

Premenopausal breast cancer

SRR per 5 kg increase:
0.99 (95% CI: 0.96-1.03)



Physical activity and pre- and postmenopausal breast cancer risk – dose-response meta-analysis

Summary RRs per increment unit of physical activity

Exposure	Premenopausal breast cancer	Postmenopausal breast cancer
Physical activity	RR (95% CI), I square (%)	
	Number of studies/cases	
Recreational	0.96 (0.90-1.03), 69%	0.98 (0.97-0.99), 0%
Per 10 MET-hour/week	3 studies, 2 331 cases	5 studies, 18 486 cases
Vigorous	0.91 (0.83-1.01), 0%	0.94 (0.86-1.02), 0%
Per 30 minute/day	3 studies, 1 473 cases	3 studies, 3 293 cases

Summary

- Greater abdominal obesity increases risk of pre- and postmenopausal breast cancer
- Weight gain and general obesity are more relevant after menopause
- Early adult obesity and physical activity are inversely associated with pre- and postmenopausal breast cancer
- Higher body fatness increases the risk of ER/PR+ breast cancers and not ER/PR- breast cancers
- Menopausal hormone therapy use masks the association of body fatness with breast cancer risk

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Thank you

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