

Do individuals who follow dietary guidelines on total energy and fat intake have lower cardiovascular event risk?

Leosdottir M, Nilsson P, Nilsson J-Å, Månsson H, Berglund G. From the Department of Medicine, Malmö University Hospital, S-205 02 Malmö, Sweden

Background and objectives

- Swedish national dietary guidelines recommend daily energy intakes of approximately 2200 kcal/day for women and 2700 kcal/day for men. They also encourage limiting fat intake to less than 30% of total daily energy and saturated- and trans-fatty acid intake to less than 10%.
- Dietary guidelines on total energy intake are based mainly on data from physiological research on energy metabolism, recommending intakes that approximately match the energy expenditure and *not* based on clinical or epidemiological research on the association between energy intake and disease.
- Results from various epidemiological, ecological, and clinical trials conducted from the 1950s through to the 1970s, support a theory that diets rich in animal fats and poor in unsaturated vegetable fats produce unfavourable risk profiles for cardiovascular disease. These results founded most of the dietary guidelines on fat intake used today in western countries.

Results

- In all, 2219 atherosclerosis-dependent cardiovascular events (fatal or non-fatal) were registered till the end of year 2000, during an average follow-up period of 6.6 years.

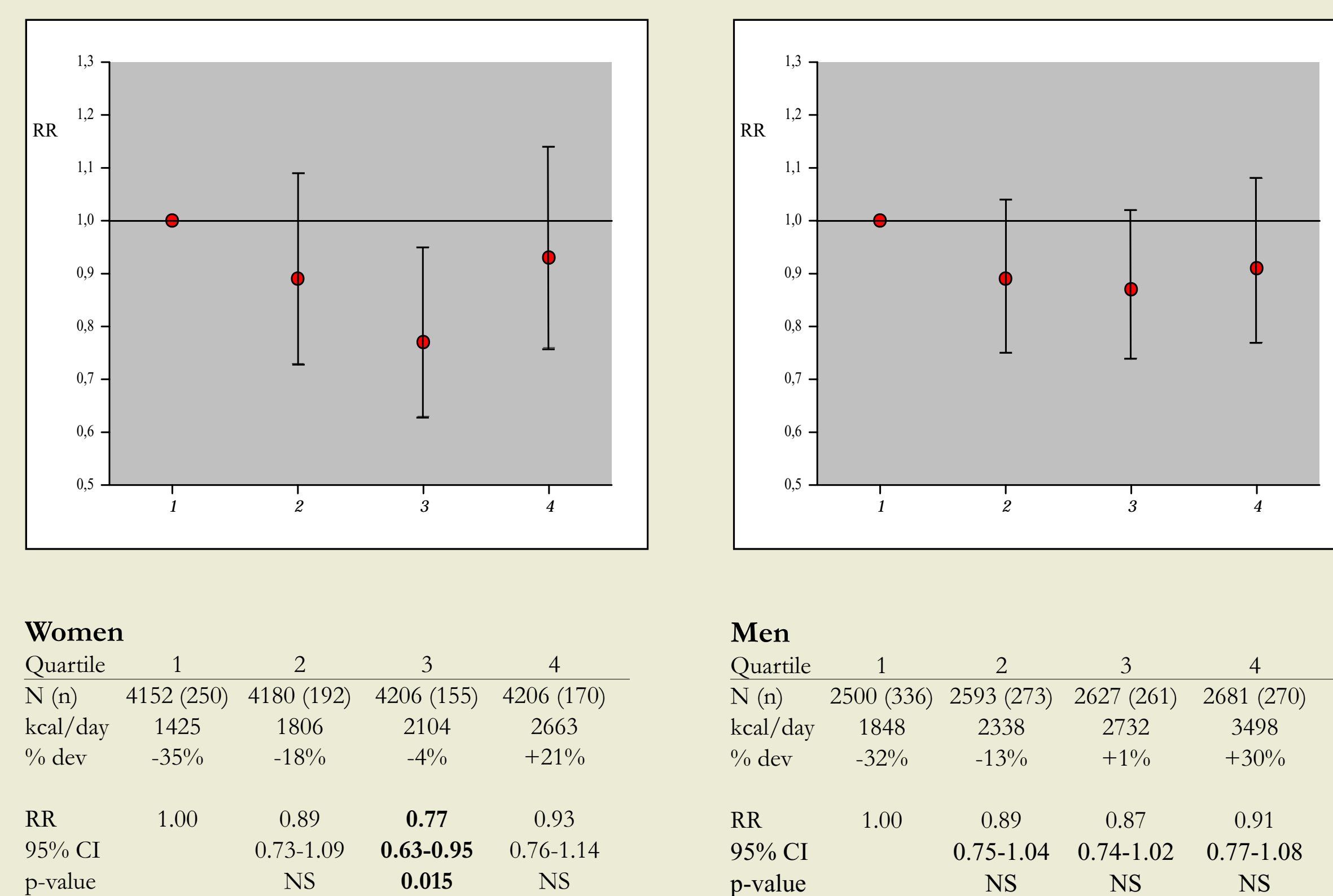


Figure 1. Total energy

The figure shows relative risk (RR) and 95% confidence intervals (CI) of cardiovascular events by quartiles of total energy intake (kcal/day). Also shown is the number of individuals in each quartile (N), the number of events (n), average intake of calories per day (kcal/day), and the deviation in total caloric intake from what is recommended by national dietary guidelines (% dev).

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- Lately, evidence from large-scale epidemiological studies has been emerging; partly defying the previously believed theory that fat is bad for the heart. Most researchers today agree on total fat intake not being a risk factor for cardiovascular disease.
- We examined whether total energy intake, total fat-, saturated fat- or unsaturated fat intake are independent risk factors for atherosclerosis-dependent cardiovascular events (fatal and non-fatal).

Conclusions

- Men ingesting calories approximately in line with national dietary guidelines did not benefit in regard to reducing cardiovascular event risk. Ingesting 20-30% more calories than recommended did not affect cardiovascular event risk for either sex.
- Subjects receiving more than 30% of their daily energy from fat and more than 10% from saturated fat did not have increased risk.
- Beneficial effects of relatively high intakes of unsaturated fats were not observed.
- Thus, in relation to risk of atherosclerosis-dependent cardiovascular events in middle aged subjects, our results do not suggest apparent health benefit from following currently used dietary guidelines on fat intake for both sexes and energy intake for men.

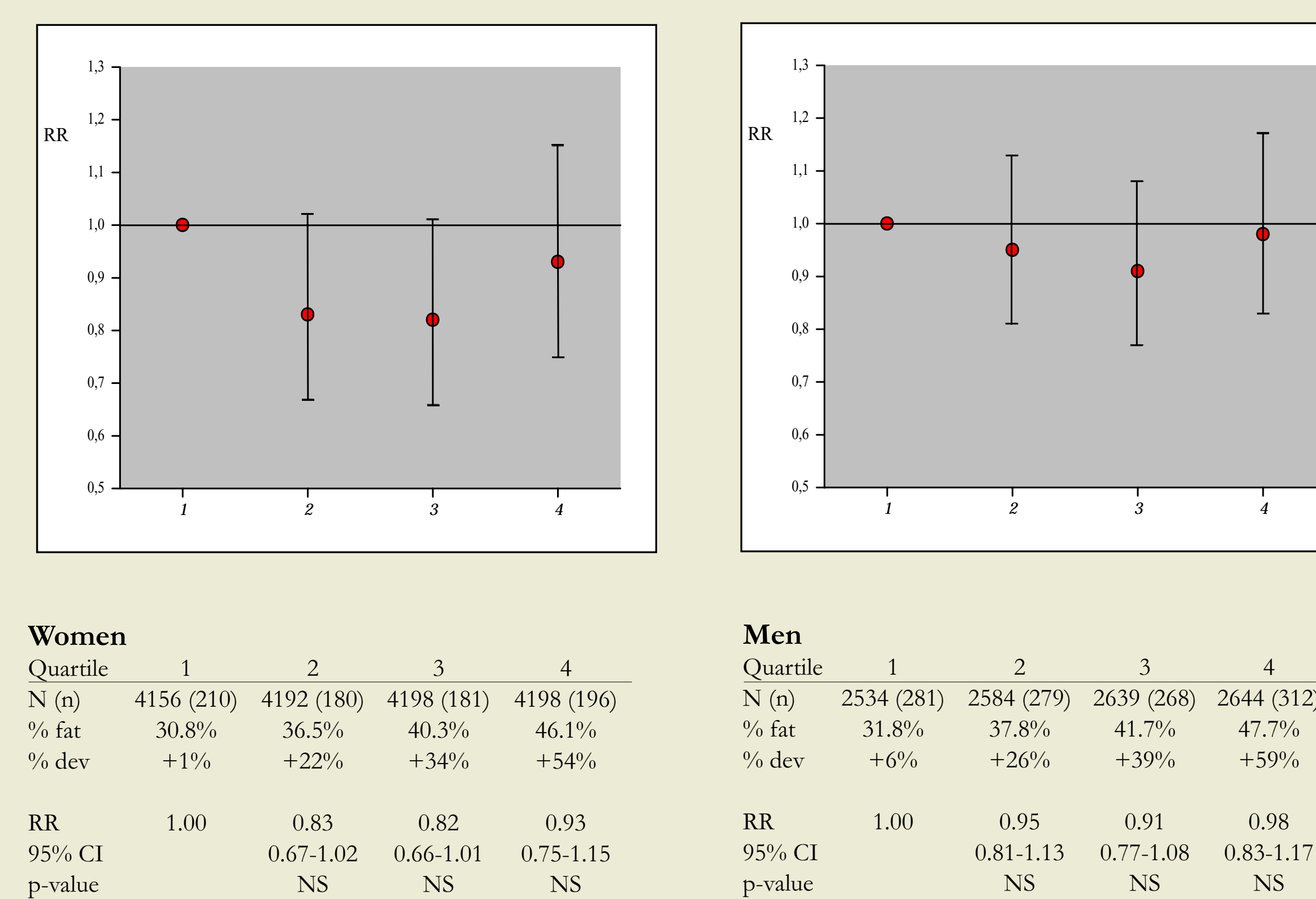


Figure 2. Total fat

The figure shows relative risk (RR; 95% CI) of cardiovascular events by quartiles of total fat intake, measured as percentage of total daily energy coming from fat. The number of individuals in each quartile (N), the number of events (n), average fat intake per day (% fat), and the deviation from what is recommended by national dietary guidelines (% dev) is also shown. Swedish dietary guidelines encourage limiting fat intake to <30% of daily energy.

Material and methods

- Material from the Malmö Diet and Cancer Study, a population-based prospective cohort study designed in 1991 to identify dietary risk factors in relation to cancer, was used in this study. In all, 28,098 middle aged individuals (61% females) underwent dietary evaluation and physical examination.
- In the current analysis, subjects were categorised by quartiles of total energy intake and relative fat intake. Cox's proportional hazards regression was used to estimate multivariate relative risks (RR) and 95% confidence intervals (CI), with the first quartiles used as reference points.
- Adjustments were made for confounding by age, smoking habits, alcohol consumption, social status, marital status, physical activity, body mass index, fibre intake and blood pressure. Information on cardiovascular disease and mortality was acquired from national registries. Patients with a prior history of myocardial infarction or stroke (n=953) were excluded.

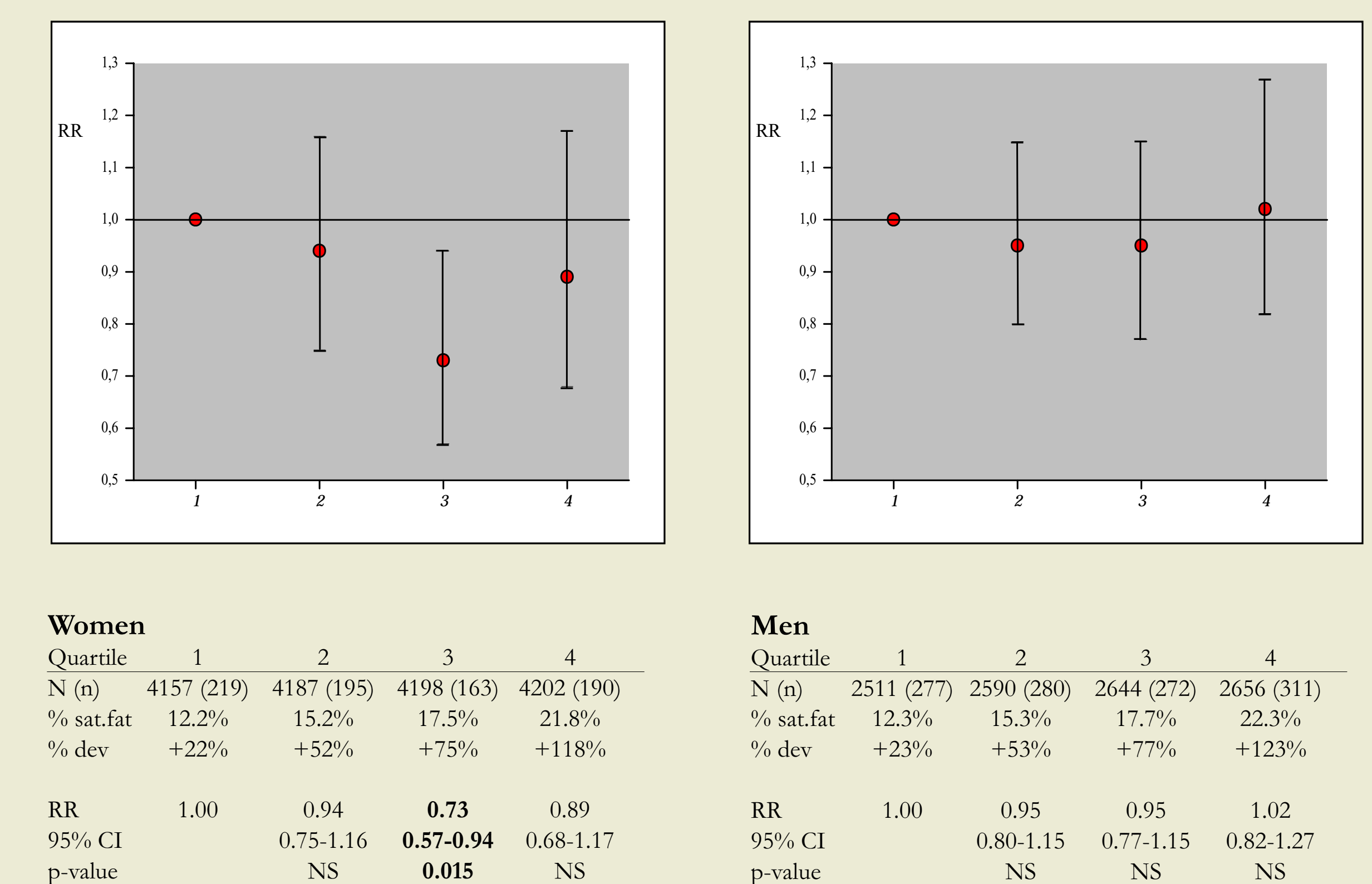


Figure 3. Saturated fat

The figure shows relative risk (RR; 95% CI) of cardiovascular events by quartiles of saturated fat intake, measured as percentage of total daily energy coming from saturated fat. The number of individuals in each quartile (N), the number of events (n), average saturated fat intake per day (% sat.fat), and the deviation from what is recommended by national dietary guidelines (% dev) is also shown. Swedish dietary guidelines encourage limiting saturated- and trans-fatty acid intake to no more than 10% of daily energy.

- No beneficial effects of relatively high intakes of unsaturated fats were observed. When looking at the ratio between monounsaturated- and saturated fat intake, relatively *higher* intakes of saturated fat were associated with a *lower* risk of cardiovascular events for women, with RR for the second quartile being 0.76 (0.62-0.94; p=0.010), the third quartile 0.79 (0.64-0.97; p=0.023), and the fourth quartile 0.81 (0.65-0.99; p=0.043). The same significant trend was observed for the ratio between polyunsaturated and saturated fat intake. No significant risk reduction was observed for men, even though all RR for the 2nd – 4th quartiles were lower than 1.00.