Author's response to reviews

Title: Improved metabolic health among the obese in six population surveys 1986 to 2009. The Northern Sweden MONICA study.

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Author's response to reviews: see over

Thank you for this edits which now all have been corrected as suggested and marked with bold text.

Best wishes

Mats Eliasson

Abstract

1) “This declined to 15.8% if subjects treated for hypertension or hypercholesterolemia were classified as not healthy.”
   - Sentence not clear - clarify what declined to 15.8%.

Response: Split into two sentences and changed to:
“In 2009 women had a 27% higher prevalence of metabolic health than men. The prevalence of metabolic health among the obese was 19.8% which declined to 15.8% if subjects treated for hypertension or hypercholesterolemia were classified as not healthy.”

2) See edits below:
   This report shows a large increase in prevalence of metabolic health from 1986 to 2009 for all anthropometric categories. Metabolic health remains considerably less prevalent among overweight and obese subjects than among those with normal weight.

Response: Changed accordingly

Results

1) See edits below:
   Over the whole period 1986 to 2009, 10.0% of participants, 25 to 64 years, were treated with anti hypertensives (n=776), lipid lowering drugs (n=218) or both. In 2009, 23.7% of participants, 25 to 74 years, were treated with anti-hypertensives (n=321), lipid lowering drugs (n=208) or both. Applying the previous definition of metabolic health but categorizing drug treated subjects as not metabolically healthy, irrespective of their blood pressure and cholesterol levels, all analyses were repeated. In general, all prevalence estimates were 2-5%-units lower. In 2009, the prevalence of metabolic health among women 25 to 74 years thus decreased from 27.9% to 24.8% and among men from 21.9% to 17.0%. The proportion metabolically healthy obese in 2009 using this definition was 15.8% compared to 19.8% with the original definition, corresponding estimates among overweight subjects were 13.1% vs 17.5% and among normal weight subjects 31.4% vs 34.6%.

Response: Changed accordingly

Discussion
1) See edits below:
Notably we have not found any previous study reporting trends long-term trends in metabolically health in a well-defined population using a standardized methodology. As recently reviewed, there is no consensus on the definition of metabolic health among the obese. As our focus was to explore the impact of obesity on CVD risk we choose to rather use the well-validated risk factors systolic blood pressure, total cholesterol and absence of diabetes. A comparison of prevalence data with other studies is not possible as the 27 studies reviewed used 30 definitions of metabolic health and prevalence ranged between 6% and 75%, with strong age dependence [24].

Response: Changed accordingly

2) See edits below:
This indicates that while a larger proportion of these subjects now are metabolically healthy, it is still detrimental for one’s health to be overweight and obese, supporting finds from the Framingham and NHANES studies [2, 12, 25].

Response: Changed accordingly

3) See edits:
However, we have also previously reported that between 2004 and 2009, waist circumference decreased and hip circumference increased among women in northern Sweden [3].

Response: Changed accordingly

4) See edits:
In subjects aged 65 years or more, prevalence of metabolic health slightly increased compared to those 55-64 years of age.

Response: Changed accordingly

Conclusions

1) See edits:
While the prevalence of overweight and obesity is increasing in the population of northern Sweden, we can for the first time report that a larger proportion within all weight groups are metabolically healthy over the 23 year observation period.

Response: Changed accordingly

2) See edits:
Thus, the strength of obesity as a CVD risk factor may be attenuated. [15].

Response: Changed accordingly