Reviewer’s report

Title: Changes in food intake patterns during 2000-2007 and 2008-2016 in the population-based prospective Northern Sweden Diet Database

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Reviewer: Carolina Batis

Reviewer’s report:

General comments

This article aims to understand changes in dietary patterns over a 16-y period and the associated sociodemographic characteristics by using a very large population-based study. The aim is very relevant, however it is unclear that the methods used are the most appropriate. The analysis and results are very hard to follow. The authors need to do a much better job synthesizing, interpreting and presenting in a clearer way their results. Moreover, it is not convincing that the main conclusion can be reached by their analysis.

When analyzing changes in dietary patterns, two type of changes could be assessed: 1) changes in the structure of the patterns (which foods are characteristic of each pattern), or 2) changes in the degree of adherence to dietary patterns (proportion of subjects in the pattern, or scores if doing PCA o factor analysis). However, to be able to look at 2) the patterns need to be the same, otherwise it is impossible to distinguish between the two types of changes. The authors compare the proportion of subjects in a similar pattern, but the patterns are not exactly the same, so the comparison is not straightforward. I believe that PCA o factor analysis is a more intuitive method for making comparisons of patterns over time, as factor loadings (for type 1), and subjects scores to applied factors (for type 2) could be compared. Otherwise, with latent class/cluster analysis it might be more suitable to perform the analysis with a dataset that includes both time periods and then compare the proportions of subjects from each period in the same pattern.

Moreover, the main conclusion "increase in intake of high-fat spread and high fat dairy and decrease in intake of fruit and vegetables" is not 100% supported by the analysis. Changes in dietary patterns cannot be translated into changes in absolute intake without further consideration. For instance, in men, the conditional mean of high-fat spread between the two periods do not seem that different.

Specific comments:

Introduction:

Line 88, the aim is misleading, the only health outcome analyzed was BMI, and the main focus of the article was on sociodemographic characteristics.
Methods:

An intervention was performed on the study population? If so, this should be stated and it should be addressed if the intervention could influence the results. This is mention on the discussion, but only briefly.

Line 111: What do the authors mean by "food intake level" and how is it different to energy intake.

Line 112: It was described that assessments were made at 40, 50 and 60 years of age, please explain the <29 years exclusion criteria.

What was the proportion of subjects with measurements in both periods analyzed?, the title refers to a prospective study, but by looking at mean age in table 1, it seems that it was mainly two cross-sections.

Why was the frequency of food used for the patterns instead of total intake of the food group (kcal, %kcal or gr)?

When selecting the best latent class solution, was there any criteria on the minimum proportion of subjects in each class? (e.g. <2% in some clusters might not be suitable).

Results:

The presentation of results is very hard to follow and understand. The authors need to re-think their presentation to make their key findings more easily identified. The figures are illegible and one table per period/gender makes comparison hard. Also, the authors might consider if that many food groups or doing the analysis by gender is necessary.

The description of the sensitivity analysis is very long (for being a "sensitivity analysis") yet it is unclear. I was unable to follow it.

Discussion:

Line 359 "Although the study design made evaluation of causality impossible" Please clarify, to which study the authors are referring? Causality between what and what?

In the 2nd, 4th and 6th paragraphs of the discussion the authors make comparisons with other studies that assessed trends in the intake of nutrients or food groups. As described above, the results from this analysis cannot be directly translated into trends in absolute intake. This is most likely why the findings are different (not the differences in dietary instrument nor the population as the authors implied).

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