Reviewer's report

Title: Variation in the effects of family background and birth region on adult obesity: results of a prospective cohort study of a Great Depression-era American cohort

Version: 1
Date: 21 August 2014

Reviewer: Philip McLoone

Reviewer's report:

This paper investigates early life factors associated with obesity in adults aged 61 and over. The question is well defined and the paper is well presented.

The paper examines factors associated with the prevalence of obesity in two time periods in the same cohort.

Analysis

Major Compulsory Revisions

Details of the total sample should be given, including numbers of cases with missing data on outcomes and explanatory variables.

New England was used as the reference group (4.3%) of sample. It is common practice that a reference group should have a substantial proportion of subjects – South Atlantic Divison would be more suitable.

The authors have used multinomial logistic regression. Multinomial logistic regression is fraught with difficulties of interpretation yet the authors present their analysis as if it was a straightforward logistic regression. The authors have not set out how they performed and interpreted the regression analysis. The authors have not stated what software they used to perform the analysis.

The authors have a large number of explanatory variables. It is unclear why they have included health variables to 'explain' obesity. Which direction do they expect causality to follow? Generally obesity is considered a risk factor for diabetes not the other way around.

The authors identify variation in obesity by region of birth after controlling for individual factors. There is an argument which says that a random effects (multilevel) model would be more appropriate when using region of birth. This multilevel approach (subjects within regions) might be limited by the number of regions (9) used but nevertheless should be explored.

Results

Major Compulsory Revisions

The authors find that region effects are associated with corn yield, infant mortality and per capita income. These ecological variables seem to be interrelated as areas with high corn yield have lower infant mortality. It is not clear what happens when they are all simultaneously entered into a model.
Minor Essential Revisions

One wonders how much of these ecological associations are being influenced by the high obesity rate in New England.

I was not particularly convinced by the author’s way of showing that selective mortality and attrition cannot explain the disappearance of the region effect. I would be more convinced if they repeated the 1992 analysis using only those subjects that they had information for in 2008.

Discretionary Revisions

The authors have longitudinal data and it would have been interesting to report the proportions who fall into each weight category at each time point, along with the proportions who change weight category.

Discussion

Major Compulsory Revisions

The discussion mixes a large number of speculative hypotheses and it is unclear how the analysis the authors present fits into any of these. Are the authors suggesting that the consumption of corn has an effect on the intrauterine environment which makes obesity more likely? Or is corn production simply an inverse surrogate for infant mortality. Ecological associations are fraught with difficulty and I do not feel that the authors have fully explained the limitations of their work.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests