Reviewer's report

Title: Effects of neighbourhood income on body mass index: an eight year longitudinal study of Canadian children

Version: 2 Date: 29 September 2007

Reviewer: Joanne Spetz

Reviewer's report:

General

This is a well-written paper on an interesting topic. The authors use an advanced statistical method in the analysis that is appropriate. The main shortcoming is that the authors assume the child’s family and geographic characteristics at baseline apply to every year of data. They make this assumption to keep the complexity of the statistical analysis from getting out of control. I might suggest the authors consider using a simpler method so they can take advantage of their data better; however this might result in a substantially different paper.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. I am concerned by the use of Cycle 1 data for covariates. It seems likely that family circumstances change, these changes are not uniform across the sample, and these changes are theoretically linked to the outcome. While it would make the multi-level model more difficult to estimate, I think accurate family and geographic data are needed for every year. By using Cycle 1 data, you are introducing measurement error and thus reducing the power of the analysis – possibly quite substantially.

2. The authors use 1996 Census data to ascertain neighborhood characteristics. Over a 10-year period, neighborhoods can change substantially. Is it possible to obtain data over time?

3. An alternative estimation approach that would allow the authors to more easily take advantage to their covariates changing over time would be Fixed Effects. The primary interest in this paper is the effect of neighborhood and family income (among other variables) on BMI percentile changes. That is, the interest is the coefficients (#). We know that Ordinary Least Squares would give us unbiased and consistent coefficients. Adding fixed effects for each child (i.e., a dummy variable for each child) would be an OLS model, and thus provide consistent # estimates. However, we think there are correlations within the levels of the model – that is, correlations between the errors for each individual (because each individual is observed multiple times). These correlations result in inconsistent estimates of the standard errors of the coefficients (but the coefficients are still
consistent). Unless we correct the standard errors in some way, we may incorrectly identify coefficients as statistically significant. A perfectly acceptable way to ensure the standard errors are consistent is to use a Huber-White correction, which also is often called a “sandwich” correction or “robust” standard errors. While a multi-level model might have an efficiency gain over this simpler approach, the efficiency gain has come at the cost of dropping all time-series variation in the covariates. This time-series variation is important – more important that a bit of an efficiency gain in my opinion. The estimation I propose can be estimated in MLwin, and it is extremely easy to do in Stata.

4. Why are the patterns depicted in Figures 1 & 2 so different? Average BMI percentiles are fairly stable over time, while percent overweight drops considerably. I’d expect a greater correlation. The implication of the Figures is that the share of children significantly underweight also must be dropping. Would this be important?

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Page 2, Abstract, Methods: delete the s in “fives”
2. Page 4, Methods, Sample: data is plural: “data are”
3. Page 5, top paragraph, I would use the American spelling of Center in Centers for Disease Control, since it is the name of an agency.

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

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.