Reviewer's report

Title: Area-level poverty and preterm birth risk: A population-based multilevel analysis

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Reviewer: Marianne M Hillemeier

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This paper explores an issue important for public health—the potential role of contextual factors in influencing health outcomes, in this case the incidence of preterm birth. The authors use data from Missouri birth records supplemented with county-level poverty rates from the census. They estimate multilevel models and find that areal poverty remains a significant predictor after individual-level factors are taken into account. As the authors point out, previous studies have also shown that areal poverty is independently related to preterm birth risk.

An important limitation of this study is that the data are 10 years old. Although it is reasonable to expect that the effects of area-level poverty are similar today as during the earlier time point, the paper would be stronger if more recent data were included.

Preterm birth is referred to as a disease in the abstract and elsewhere in the paper. A better description can be found in the recent IOM report the authors cite with refers to preterm birth as a “cluster of problems.” Also in the abstract, it is stated that the paper looks at “neighborhood-level” poverty. Since the areal measure of poverty is at the county level, this is not strictly accurate.

In some cases references are outdated. For example, in the background section, more recent statistics on preterm birth are available in Hamilton, Brady E., Joyce A. Martin, and Stephanie J. Ventura. 2007. "Births: Preliminary data for 2006." National Vital Statistics Reports 56:1-18.

Overall the paper would be strengthened if more detail and justification were provided about the variables in the analyses. For example, in the methods section there is little discussion about categories of race/ethnicity in the data and how this variable was defined. Some variables could also be more optimally defined. For example, adequacy of prenatal care utilization has been quantified in the paper only as late entry into care, however there are other indices (such as the Adequacy of Prenatal Care Utilization or APNCU) which are more complete.

More information about the “missing data” prior to 1989 would be helpful. Is the data missing because there was incomplete ascertainment of all births in the registry, or because data collection forms were revised to include more information after that date?

The discussion of policy implications would benefit from more detail and
specificity.

The numerous typographical and grammatical errors in the manuscript are distracting and should be corrected.

**Level of interest:** An article of limited interest

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests