Reviewer's report

Title: Geographic variation in cesarean delivery in the United States

Version: 2
Date: 7 June 2014

Reviewer: Katy B Kozhimannil

Reviewer's report:

Thank you for the opportunity to review this manuscript, which represents an important contribution to the field. I suggest several revisions to strengthen or clarify the paper.

Major Compulsory Revisions:

1) Please describe your methods and risk adjustment strategy in greater detail (Page 7, top). Specifically, please address why race and primary expected payer (a proxy for SES) were included? There is active debate about the inclusion of SES and race/ethnicity in risk adjustment, and it may be justified, but should be done explicitly. If there is no clear justification, please consider dropping these. You may want to consult the following NQF project: http://www.qualityforum.org/Risk_Adjustment_SES.aspx. The paragraph on the middle of page 7 describes the hierarchical model and the variables included, but does not provide a specific justification for including these – why are all maternal conditions (not just medical indications for cesarean) included? Also, is the hospital considered a level in the analysis? How is this included?

Minor Essential Revisions:

2) The unit of analysis (CBSA, correct?) is not clear in the abstract, and interpretation of study results is confusing because it’s not clear if/when the unit is an individual hospitalization or a rate or proportion of the birth hospitalizations in the CBSA. Please revise the abstract and results sections for clarity. In addition, please state the sample size (total number of CBSAs) in the methods section, not results, and please also list the percentage of all CBSAs in the US that this represents.


Discretionary Revisions:

4) Abstract: define “geographic area” in first sentence – CBSA?

5) Abstract: In results here (and in main manuscript), phrases such as “Private insurance had a higher primary cesarean rate” are not clear. Is this referring to women with private insurance, or to the proportion of births in a CBSA paid by private insurance? Similar issues with clarity for “the percent African American in
the population.” What population, exactly?


7) Methods, bottom of page 4: Please note the 6 excluded states.

8) Methods, page 5: “we obtained characteristics on population size…” Was this for the CBSA or ZIP level?

9) Results, page 7: “Adjusted rates did not vary substantially from unadjusted rates.” I think this is quite surprising and worthy of discussion in the discussion section of the manuscript. Perhaps on the bottom of page 10, it could be included?

10) Results, page 8: “Asian and Native American backgrounds were associated” This phrase is confusing – is this referring to women with these backgrounds or the percentage of the population of this background within the CBSA?

11) Discussion, page 11: “Primary care physicians per capita were associated with…” Were the individual physicians associated with reduced rates of cesarean? Or as a CBSA-level? Also, how might the number of primary care physicians reduce the need for cesareans (following sentence)? Are there data to show this?

12) Conclusion, page 12: Please re-state your findings and describe how they relate to the other issues discussed in the conclusion section.

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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.