Reviewer’s report

Title: Effect of risk-based capitation model on caries inequalities in preschool children assessed by geo-mapping

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Reviewer: Peter Bottenberg

Reviewer's report:

The approach of the manuscript is interesting and original. However, it duplicates methods of a previous article.

What frustrates me most is the way a rather new (although for readers whose interest is more situated in the clinical aspects) method is described. Bayesian statistics is not something an interested dental scholar is absolutely familiar with. The applied method is referred to in a previous paper by the same author team, however, the relevant method section is just copied and pasted and did not contribute to my enlightenment. Two other papers were clearly written for a statistically well informed audience. As far as my interpretation of reference #8 goes, the method used can have possible imprecisions. The authors should lose a few words in the discussion on the merits and possible drawbacks of the applied method.

Phrases like: "We underline that such Bayesian smoothing yielded "shrinkage" of the conventional observed-to-expected ratios. The corresponding statistical certainty geo-maps were obtained by calculating the posterior probabilities of a parish-specific relative risks above 1 given the data, denoted Pr(RR>1|data), using the Bayesian approach." contribute to the prejudice of a distrustful mind that statistical methods allow any which one conclusion if you just fiddle long enough with the parameters or for the more simple spirit that statistics is a kind of black magic only accessible to the initiated. This would also allow readers to understand the difference between the green-and-purple map and the certainty map.

In the results section (p6, line 47) is mentioned "When parishes with statistically outlying RRs were excluded". Was it a positive or negative outlier? From figure 1, it seems to be one with a very high polarization index. Is the exclusion justified? What makes the parish to be so polarized? In Fig. 1, also the exclusion of 4 parishes is mentiond. Same question applies.

Then the conclusions can be placed in proper context.

Several times in the text children of foreign origin are mentioned; however, the relationship with the geo-mapping concept remains unclear. Is a shift in caries risk attributable to migration in the specific parishes? This does not seem to be the case, since they were excluded from geo-mapping. All of a sudden, they re-appear in the discussion.
More down to earth, it would be worth mentioning by whom the epidemiological data were collected (p5, line 1) and if there was some standardization or calibration involved. Furthermore, "parish" has a rather ecclesiastical connotation. Looking it up, it seems to be used in Anglo-Saxon countries. However, I propose at least to clarify it as "administrative parish".

In Figure 3 and 4, the shading for the "extreme value" does not coincide between map and legend.

More interesting would be to draw a map showing differences in caries RR between 2010 and 2016.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

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