Author’s response to reviews

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

Authors:

Svante. Twetman (stwe@sund.ku.dk)

Anders Holmen (anders.holmen@regionhalland.se)

Ulf Stromberg (ulf.a.stromberg@gu.se)

Gunnel Hakansson (gunnel.hakansson@regionhalland.se)

Version: 1  Date: 02 Nov 2017

Author’s response to reviews:

Editor Comments:

Please comment in particular on description of outliers as well as of the influence of migration on the results.

Our response: We have changed the text accordingly and it is hopefully now easier to follow. For the details, please, see our response to Reviewer 2 below.

Reviewer reports:

Christos Rahiotis (Reviewer 1): The paper is well conducted and well written. The methodology is a adequate and well-established.

Our response: Thank you!

Peter Bottenberg, PhD (Reviewer 2): 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 \( Pr(\text{RR}>1|\text{data}) \), 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.

Our response: Thank you for the comments. We have added a new paragraph in the discussion, underlining the merits and limitations of the applied methods.

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 mentioned. Same question applies.

Then the conclusions can be placed in proper context.

Our response: The polarization index reflects the regional polarization of caries risk. The study region consists of 58 administrative parishes. A single parish was regarded as an “outlier” if the estimated risk of caries for the children living in that parish corresponded to an outlying (or extreme) value according to a conventional statistical definition. We have clarified the definition of outliers in the method section. Moreover, we have clarified that a sensitivity analysis of the polarization index was performed by excluding the outliers.

We can only speculate on the reason for the polarized outliers. Migrants and refugees arriving to Sweden are placed in rural camps during the asylum process. Unfortunately, this process takes several years nowadays due to the high number of new arrivals. During the process, all migrants/refugees are fully eligible to free medical and dental care and many children born are
born in the camps. They are not excluded in the present study; we excluded only migrant children born outside Sweden. This can contribute to significant shifts in the burden of caries for an administrative parish.

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.

Our response: The discussion was an attempt to explain how a sudden migration of foreign children with a heavy burden of caries can affect the permanent residents. The Public Dental Clinics have to assign a great deal of limited resources to emergency treatments which may crowd out the care of those with less urgent need. The discussion has been amended to improve this understanding.

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".

Our response: The epidemiological data were collected and filed in digital records by the responsible dentist at the different Public Dental clinics and they are regularly trained and calibrated at least once every second year. All clinics share the same record system and the data for the present study was simply extracted from the records. We have clarified this and changed the word “parish” to “administrative parish” throughout the manuscript as suggested.

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

Our response: Figures 3 and 4 are corrected so the shading of the extreme values coincidence between map and legend.
More interesting would be to draw a map showing differences in caries RR between 2010 and 2016.

Our response: We focused on changes in the polarization index (i.e., changes in the regional polarization of caries risk) rather than on more specific spatial changes in caries RR. However, the reviewer raises a relevant point of concern, which we now address in the new paragraph in the discussion.