Reviewer's report

Title: The Dental Health of primary school children living in fluoridated, pre-fluoridated and non-fluoridated communities in New South Wales, Australia

Version: 3 Date: 24 September 2014

Reviewer: Jonathan Broadbent

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Discretionary Revisions

Is it possible to expand on why four of the school principals refused to allow their schools to participate in the study? While the research was about water fluoridation, there was no intervention directly applied as part of the research, is that correct? Did the principals decline to participate because of concerns about the ethics of the research design or because of some other concern?

Minor Essential Revisions

For consistency, ensure data values are consistently reported to 1 decimal place.

A number of grammar issues exist. For example, "wide spread" should be one word. "Occular" is spelt wrong, it should be "ocular".

The writing should be more succinct and to the point. For example, the first sentence of the abstract reads as if this is a manuscript about the history of CWF, not its ongoing development. It is acceptable to keep that material, but de-emphasise the history and use the opening of the introduction to explain the rationale behind the paper. E.g. explain why the research was needed.

The in-text citation formatting varies throughout the manuscript. Be consistent with the journal guidelines.

The authors state that "up to ten per cent of the children were re-examined to record intra-examiner consistency". What was the actual percentage? Did the percentage of children who were re-examined vary between examiners? What was the variation?

Why is "examiner" capitalised in the 2nd paragraph of p4?

The sentence structure could be improved through the manuscript. For example, in the sentence on how caries experience was measured (last sentence of page 4) it reads as if the dmft index is calculated based on decayed, missing, filled, percent caries-free and significant caries index, and that this was done differently according to geographic location. It is clear what the authors mean but the sentence structure is poor.

The authors state that regression analysis was used to identify significant independent associations etc. I presume that regression analysis was also used to identify risk factors that were not associated with caries experience/dmft. Please clarify this sentence.
Major Compulsory Revisions

Please clarify the population sizes of Gosford and Wyong. You state population sizes of 130,000 and 143,400, respectively, but Wikipedia tells me that the populations are only about 3500 each. This seems to be because the town of Gosford is called ‘Gosford’, but the local government area is called ‘City of Gosford’. A similar situation exists for Wyong, where the city/town is called Wyong but the local government area is called Wyong Shire. As BMC is international and not an Australian journal it should be clarified for non-Aussie readers that you are discussing the local government areas.

The meaning of the term ‘pre-fluoridated area’ is not clear. I understand that the authors are referring to an area that was not fluoridated at the time of data collection but is now fluoridated, but some readers could potentially be confused and think the area was ‘previously fluoridated’ (particularly if a reader stopped at the abstract).

Proportionally fewer participants were examined in the unfluoridated area (only 55.3%) than the other areas (F 77.5%, pre-F 80.1%). Usually in studies of dental caries, those who are not included tend to be of lower SES and have poorer dental health. This might result in an underestimate of the difference between the groups. I have a few questions about this:

1. Why were the participation rates different between the areas?
2. Do the authors have data on the general demographics of the populations of each area? Can this be reported in order to demonstrate whether there are any systematic differences between participants and non-participants between the areas?
3. What do the authors think about the likelihood and implications of nonparticipation bias?
4. Are there any analytical techniques that may help account for this?
5. The authors report (p6) that none of the differences between groups for any of the social characteristics recorded were statistically significant, but the results from the statistical tests are not provided. Please include these in a footnote for Table 1. On checking these data for differences myself I have a concern, because using a 2x2 table comparing the proportion of concession card holders in the fluoridated and pre-fluoridated area, I see a statistically significant difference. Please explain.

Were the examiner reliability scores for the examiners who did the examinations in Wyong and Gosford different from those who did the examinations in North Coast? The range is from 0.79 to 0.91 for the overall dmft scores, but what was the agreement at the tooth level? What component of the dmft index relate to?

What qualified the Gold Examiner to be considered the Gold examiner? What were the scores for reliability in repeated examinations for the Gold examiner?

There is comment that the examiners were calibrated (on p4), but I cannot see any comment on how the calibration was done. Was calibration done prior to
data collection? Did the examiners meet to discuss differences in their scorings? An ICC of 0.79 reflects what I would see as 'acceptable' but not necessarily 'high' agreement as claimed in the text (definitions do vary).

At the end of the results the authors state "Aboriginality and cardholder status also had a marked influence on dental disease". I see this as technically incorrect, because terms like 'influence' imply causality. There is nothing about the Aboriginal genome that predisposes people of that ethnicity to dental caries. Rather, being Aboriginal is a factor that is associated with systematic deprivation, disadvantage, and discrimination. Being Aboriginal is a risk marker for greater dental disease, it does not cause it.

Avoid Australasian vernacular such as "Tyranny of Distance" (p8).

Change the last paragraph of the discussion, or delete it. It isn't really necessary and is a bit 'loaded' the way currently written.

Check the references carefully. For example, the authors cite a study (reference 17) by Skinner et al (2013) but get the title of the article slightly wrong.

I'm also not sure about the citation to Barnard (reference 3), because a search of Pubmed doesn't reveal the article. Was this just an abstract from an IADR conference that was published in a special issue of J Dent Res?

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.