Reviewer's report

Title: Causes of death in Tonga: quality of certification and implications for statistics

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Reviewer: Robert Anderson

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Overall, this is an important paper and highlights problems with cause-of-death certification common in many countries around the world, including the U.S. The authors have done a nice job with their study design and, as a result, have been able to make some sense of the Tongan mortality data. The most important result of this study is how this affects changes in the way the Tongans certify cause of death and how they tabulate their data. Assuming such changes are adopted, this should substantially improve our understanding of Tongan mortality and serve as a model for other countries with similar problems. I have only a few minor comments and concerns.

Minor Essential Revisions

1. On p. 4, the authors specify ICDv10AM as the classification system used for coding cause of death. AM, I assume, denotes the “Australian Modification” of the ICD. The reference (11), however, is to the WHO version of the ICD, which is not equivalent to ICD10AM. The AM version is used in Australia for morbidity coding only (the Australians use the WHO version for mortality coding), although it has been used in a few other countries (e.g., New Zealand…I think) for mortality coding. If the AM version is used in Tonga for mortality coding, the reference needs to be changed (and the Tongans should be encouraged to use the WHO version for better comparability). If it is the WHO version that is used, then the text needs to be altered to reflect this.

2. A better explanation of terms such as immediate and underlying cause is needed along with a better explanation as to how the medical certification of cause of death should be done. An image of the Tongan (or perhaps, international) medical certificate would be helpful here, as would some specific examples to illustrate the common problems.

3. ICD coding procedures, especially selection of underlying cause, need to be more clearly explained. How is the underlying cause selected? Who is doing the coding? Are these folks trained to apply the ICD rules? Are the ICD selection and modification rules applied? The lack of clear explanation results in some confusion especially regarding the issue of movement of contributory causes into Part I of the certificate and how the selection rules mitigate this problem.

4. On p. 12, the authors state that the effect of movement of contributing causes into the causal sequence is likely to be minor, other than for diabetes, if the ICD rules are rigorously applied. This statement could benefit from some additional
explanation regarding coding and selection procedures (see previous comment). Also, it is not immediately clear why diabetes is the exception…without looking up the reference (which I assume should be 19…not 21…see p. 13, top of page) and doing some additional research. An example would be helpful here.

5. Check reference numbering throughout. E.g., in addition to the problem with references 19 and 21 in the previous comment, on p. 6, it seems that reference 15 (3rd paragraph) should actually be 14 (reference to the international medical certificate of death). Reference 15 (Johansson et al, should be referenced on the following page (p. 7, first sentence).

**Level of interest:** An article of importance in its field

**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