Reviewer’s report

Title: Performance of Physician Certification of Verbal Autopsies: Multi-Site Validation Study using Clinical Diagnostic Gold Standards

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Reviewer: Elisabeth França

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Performance of physician certification of verbal autopsies: multi-site validation study using clinical diagnostic gold standards

The focus of this study is to describe the performance of the physician certification of causes of death on verbal autopsy (PCVA) using an expressive size of dataset (12,542 deaths) collected at six sites in four countries. It presents results of a validation study of the PCVA comparing different procedures: VAs with and without healthcare experience (HCE), physicians with and without local information, and also using two physicians’ readers. So its subject is of great interest in the field of verbal autopsy (VA) due to the wide use of PCVA and the careful methodology used in the study. The points raised by the authors will certainly contribute to better understanding of the role of the PCVA.

The article is well written and the analyses are pertinent to the objectives of the study. I have only a few specific comments to make as follows.

1. In the Abstract Methods, please consider including the criteria of the gold standard causes of deaths used in the study because it was mentioned in the Results section (and also in the Background section) without specific definition.

2. In reference to the gold standard above mentioned, we are informed that the number of adults, child and neonates deaths by cause used in this research and presented in Annex 1 comprises of both levels 1 and 2 gold standard causes of death. Given the importance of this issue which is considered one of the most important contributions of this article, the addition of the number of deaths by levels of diagnostic certainty would be welcomed by readers.

3. In the Methods section, I would appreciate a more specific and detailed description of the cause of death classification list mentioned on page 5, first paragraph of Data analysis. The specific diagnoses can be seen in figures 3-5 and in the additional files (Annex 1, 2 and 3), but as this information has important relevance to the analysis I think it would be better to present them also in the text of the Methods section.

4. In reference to the list of causes of death cited above and specified in the annexes, I suggest changing the title “neonates causes” to “perinatal causes” and presenting the specific stillbirth´s causes (pre-eclampsia? infections?)
because the use of the term “stillbirth” as a neonate cause of death is not adequate. Besides, if the cause of stillbirth was not specified in the study I suggest using the term “unexplained stillbirth” or a similar one.

5. I was a little confused when comparing Figure 1 and the explanation presented in the item “Organization of Physician review of VAs”. For example, please clarify why 90% of VAs were single-review according to this figure, and in the text it was mentioned that “all VAs were read by one physician” (page 4).

6. Also on page 4 it was stated that 50% of VAs were reviewed by a “different physician” using complete information, i.e. VA with HCE. As observed by the authors, “physicians vary markedly in their ability to assign the true cause controlling for cause of death, availability of HCE, and whether the physician is from the site or another location”. Thus, using a different physician when comparing PCVA for VAs with and without HCE could introduce errors due to different observers which can be a confounding factor when comparing the different procedures. This could lead to a misunderstanding of the process of the physician review of VAs presented, and the authors should clarify these issues.

Discretionary Revisions

1. In the Abstract, please consider changing or specifying the term “local prior information” due to the difficulty in understanding it in this section.

2. I think it would be useful for readers who would not read the specific reference mentioned in the text an explanation about the meaning of the term “priority causes” (page 4, first paragraph of Methods).

3. Maybe the sub-title “PHMRC Study Overview” (p. 4) could be changed to “Definition of the gold standard cause of death” or similar.

4. The definition of the variable HCE has been found in different parts of the Methods section (pages 4 and 5) and also in the Results (p. 6, first paragraph), and should be reviewed and standardized. Does the term “medical information” mentioned in Figure 1 have the same meaning as HCE?

5. Page 7, fourth paragraph: the table mentioned should be table 3.

**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.