Reviewer’s report

Title: Estimating cause-specific mortality in Madagascar: an evaluation of death notification data from the capital city

Version: 0 Date: 10 Apr 2019

Reviewer: Don de Savigny

Reviewer's report:

This is an important paper for all those interested in cause specific mortality in Africa. It demonstrates the application of a variety of useful methodological approaches for settings where the majority of deaths are notified to the health sector with a physician certified cause. Even in countries with highly sub-optimal national civil registration and vital statistics systems like Madagascar, such data sets are often available in large urban centers where there are large teaching hospitals and high physician access. This paper shows how much can be learned in such situations.

A laudable feature of this paper is the effort that went into manually redistributing garbage codes according to principles modified from the GBD. Their garbage code algorithm logic is well explained, easy to understand and the result was still a highly plausible concordance with GBD CSMFs after redistribution of garbage codes, despite the urban and hospital bias of the source data.

It would be good if the authors, given their wide experience in Africa, could add a few lines in discussion to comment on how this approach could be extended to other countries in the Region. In particular, what features in Antananarivo they would consider important to generalizing their approach elsewhere. I assume it includes the special case where the health sector issues burial permits only after there is a physician certified cause, even for home deaths, and that all hospitals, public, private, and teaching, participate. It is remarkable that 40 years of data were available for analysis. Much of this period would have been based on paper records (which don't last so long in Africa), so I assume that much of the older data had already been "rescued" digitally for analysis in this series. There may be other features important to how well this worked in Antananarivo that could be listed in a table. e.g. the very prompt reporting of deaths to the health sector.

One point of interest to readers (that could be added to the annex) would be a copy or description of the typical medical certificate of cause of death form that has been used over the years. Did it conform to the general format of the WHO MCCoD certificate with immediate, intermediate, and underlying causes sequenced in the form? The authors refer to initiating cause as the underlying cause. It is interesting that the largest discrepancy from GBD is the relatively small
proportion of Level 3 Injury / External causes seen in the data compared with the GBD estimates (Table 2). Could this be due to the fact that often in hospital deaths in Africa, the underlying cause of injury is not recorded on the MCCoD form?

An important conclusion stated in this paper is the potential of verbal autopsy to augment such data sets where home deaths are a prevalent share of deaths.

This is a rich paper, well and clearly written, that draws attention to an insufficiently considered source of mortality data in Africa and provides practical methodological approaches. I recommend acceptance for publication in Population Health Metrics. Minor revisions could be considered as above to add value.

**Level of interest**
Please indicate how interesting you found the manuscript:

An article of importance in its field

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

**Declaration of competing interests**
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests.
I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal.