Reviewer's report

Title: Tuberculosis and HIV are the leading causes of adult death in northwest Ethiopia: evidence from verbal autopsy data of Dabat Health and Demographic Surveillance System, 2007-2013

Version: 0 Date: 04 Oct 2016

Reviewer: Chalapati Rao

Reviewer's report:

General comments

This article presents methods and findings from a study that used verbal autopsies to investigate causes of death in a demographic surveillance site in Northern Ethiopia. The article is informative particularly in terms of providing information on mortality patterns in a region from where little empirical information is available. This is a sufficient reason for the manuscript to be published. However, there are several aspects that require attention to improve its quality and presentation to the scientific community. Since the article was not paginated, the comments are according to the section/sub section titles.

1. In the study setting section, a few details of the population coverage and health services (primary health centres; hospitals; doctors; local health staff etc) available to the HDSS community should be provided.

2. VA data collection procedure: Describe some details of the questionnaire - language version used; any local modifications to the INDEPTH version; use of paper forms or electronic data collection platform; educational qualifications of VA interviewers

3. Data quality management - more details on training programs for physician reviewers and evaluation of physician training; whether physician certification was according to multiple causes followed by ICD rules for the underlying cause; or based on physicians directly adjudicating and mentioning only the underlying cause
4. Broad causes of death: it is not clear for which period the data presented on lines 2-4 of this paragraph refer to. Also, the percentage for NCDS (13.22%) in this sentence appears to be wrong.

5. Broad causes of death (contd). The results presented on lines 4-9 of this paragraph needs to be substantiated, in terms of some reasoning for the variations causes across different years. Is there some specific trend? Could these variations be an artefact of the low numbers of deaths (small numbers?) Or, could they be a result of variations in VA procedures. A couple of essential details here; followed if necessary, by more details in the discussion would help explain the variations.

6. Specific causes/Major causes: Again, the text merely repeats what is stated in the tables. Some interpretation of the trends or variations (or similarities) across time or between urban and rural areas needs to be mentioned. In regard to meningitis, more details on the age-sex distribution would be helpful. Were meningitis deaths concentrated in any specific age/sex group?

7. Table 2: Provide total numbers of deaths at the bottom of each column. Percentages need only one decimal place. Check formatting of brackets.

8. Similar to comment 6 above; more interpretation is required of the data presented in regard to climactic zones and deaths among women. Formatting and details in Table 3 should conform to recommendations made above for Table 2.

9. The results of the Chi squared test presented for trends in communicable and non-communicable diseases in Table 4 are not clear. Which differences are statistically significant? Table 4 presents odds ratios, but not marked for any statistical significance; nor displayed with 95% CI, to infer statistical significance. This should be rectified.
10. Factors associated with specific causes of death. In general, Table 5 needs a major revision.

a. The abbreviations COR and AOR need to be expanded; I assume they mean 'Crude odds ratio' and 'adjusted Odds ratio' but these need to be spelt out.

b. It would be easier to consistently interpret in all instances 'excess' risks of mortality in all the associations, rather than the use of 'reduced' risk in some instances and excess risk in others. For example; reduced risk of non-communicable disease mortality in rural areas could be alternatively (and more meaningfully) presented as 'excess' risk of NCD mortality in urban areas. Reduced risks are generally discussed in regard to the effect of specific clinical or public health interventions; in terms of a 'protective' effect. It is suggested to redo the table presenting and highlighting the findings in terms of 'excess' risks of mortality.

c. In particular, for external causes; you could use the OR for ages above 50 years as the base; and compute the ORs for the younger age groups as 'excess' risks. This will convey a more meaningful epidemiological interpretation of the data, for planning interventions. Also, in the text of the results section, some information on the proportionate composition of external causes (road accidents/falls/occupational injuries etc) could be presented. Table 3 presents some of the specific external causes, but the presented data in the table accounts for only 41 of the 124 total deaths from external causes, something appears to be missing.

d. Statistical significance is to be highlighted & discussed only for 'Adjusted Odds ratios'; and not crude odds ratio.

e. Statistical significance of association of Education with any of the mortality outcomes should be removed; since they are not consistent either across all the outcomes; or with common knowledge of the associations between education and health outcomes. In all probability, the observed statistical significance in some instances are an artefact of small numbers.
11. Discussion: The article compares findings from this study with at least two other HDSS sites in Ethiopia. It would be interesting to see a pooled analysis of data across these three (or potentially any additional) HDSS sites in Ethiopia; in an attempt to get an understanding of broader national mortality patterns. While such an analysis is beyond the scope of this article; the discussion should raise the potential as well as the need for such analysis, and suggest mechanisms, and potential benefits from the same.

12. Towards the end, the authors mention challenges in regard to physicians agreeing on the probable cause of death. If data are available, the authors could present the percentage of cases with agreement between two; percentage referred to the third and subsequent agreement with either of the first two; and finally, the percentage remaining undetermined due to disagreement across all three reviewers. This will give a better understanding of the nature of the challenge.

13. The discussion could also clarify whether the VA questionnaire included a 'free text' section for the interviewer to record an open narrative provided by the respondent about the terminal illness and events. If such a section was present in the questionnaire, the authors could also seek and provide opinion from physician reviewers as to the general value of such a section in formulating a diagnosis of the probable cause of death, in addition to the information from structured questions.

14. Finally, the discussion could also highlight any immediate clinical interventions or public health measures that could directly be informed or implemented, as guided by the findings from this study.

15. The article needs to be carefully checked for spellings; typos, and occasional grammatical errors.
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