Reviewer's report

Title: Myanmar mortality registration: an assessment for system improvement

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Reviewer: Chalapati Rao

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General comments

This article provides a descriptive analysis of the current status of vital statistics from the national death registration system in Myanmar. The findings from the statistical analysis confirm previous assessments of the quality of data from the Myanmar national mortality statistics system. However, some more direct evidence is required regarding data quality, as well as a more objective assessment of the operational characteristics of the processes for death registration and compilation of vital statistics. These would provide a basis for a set of concrete recommendations to 'improve' the system, as seems to be the intention of the article, from its title.

Major revisions

1. The paper makes several comparisons with data from the 2014 Census, which to some extent considers that the 2014 Census is a more reliable data source for all-cause mortality measurement. The Methods section should include a paragraph describing the methodology of mortality data collection in the Census 2014.

2. Estimates from the UN and US Census Bureau should also be qualified with a brief description of their methodology, and most importantly, the data sources from Myanmar that were utilised in such estimation, and if such information on data sources or methodology for estimation is not available, this should be mentioned.
3. Table 1 should present directly comparable numbers. i.e the CDR from VRS should be compared with the CDR from the 2014 Census, and so on. This will provide direct evidence of potential under-reporting in the VRS. Similarly, the U5MR, adult mortality (risk of dying between 15 and 60 years), expectation of life at age 60 years, and life expectancy at birth should all be presented from the VRS 2013, as well Census 2014; for both sexes, and at national and state level.

4. To simplify presentation, there could be a separate table each for males and females. And, data could be compared across urban and rural areas. To solve issues of space (if any) some of this material could be presented in a web appendix file, but these findings will identify specific states/regions that need to be targeted for improvement, which should be discussed in the article.

5. Figure 1: The log plots of age-specific mortality rates should be presented as overlapping line graphs separately for males and females, with each graph having a line of ASMRS from each of the three sources, in different colours or styles (dotted/dashed etc). This will enable a clear appreciation of the trend and magnitude of differences in mortality patterns across the three sources, and relevant observations should be documented in the text.

6. Figure 2: The three sources used in the comparison here should be the same as the three sources used in Figure 1. This will enable a clear understanding of the links between figures 1 and 2, and the interpretations there in.

7. Figure 3: The gender differences in the 2014 Census mortality data need to be discussed in more detail, and this will be supported by the findings presented in the revisions to Table 1 as recommended above. This is required because the Census 2014 mortality data, as mentioned in Comment 1, seems to represent a more accurate pattern of mortality in Myanmar. The gender differentials observed in Figure 3 should be explored further as to whether there is likelihood of some differences (more than observed from the historical data) being a true phenomenon, since they are also present in the more complete data from Census 2014. Or else, do the findings from both VRS 2013 and Census 2014 suggest that there are possibly some underlying societal or administrative reasons for such under-reporting / registration of female mortality. These issues should be discussed in detail.
8. Tables 2 and 3. The observed higher proportions of Group 2 mortality are more likely to be due to the severe-under-registration of child deaths, which are largely from neonatal conditions (prematurity/low birth weight/birth asphyxia/birth trauma); and infectious diseases (pneumonia, diarrhoeal diseases, and malaria). Very low representation of these deaths in the data result in the observed higher proportions of NCD mortality, and not the 'over-registration' of NCD deaths. Such 'over-registration' can only be demonstrated through a validation exercise that identifies misclassification patterns of Group 1 deaths to NCDs. The text referring to this aspect on pages 10-12 as well as in the discussion should reflect the observed skew to be largely due to under-registration of infant and child deaths.

9. Table 3: The footnote to Table 3 suggests that the proportions have been calculated using the denominator of deaths with 'proper' codes i.e 156,352. This is a misrepresentation of the proportional mortality patterns by cause in the VRS 2013. The proportions presented for specific causes should be calculated using the total deaths in the VRS data as the denominator; i.e 199,491.

10. Figure 3: The age-patterns should be presented separately for males and females. Each graph should present overlapping lines for each cause group from each of the two sources in different colour or style; to readily observe the differences in age patterns across the two sources, and present their observations accordingly. The authors could look at Figure 1 in the following reference, as an example of such data representation.


While the Turkish figure compares urban and rural patterns, the figure in this article could compare the VRS 2013 proportions with the WHO Estimates, for males and females respectively.

11. The Brass Growth Balance method estimates registration completeness only at ages above 5 years, and does not account for completeness of under-5 mortality data. This should be mentioned and discussed carefully, when comparing findings from the Brass method with the UNICEF, which possibly only estimates birth registration completeness, and not death registration completeness at all ages. Hence, these measures may not be directly comparable.
12. The recommendations for system improvement presented in the discussion need to be linked and targeted to the specific findings in the results, particularly in regard to administrative, technical and societal aspects of death registration and compilation of mortality statistics.

13. Reference 14 is the main source for the methodology used in this study, and is also cited in several locations to substantiate findings and interpretations. A web link should be included for readers to readily access this document.

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