Reviewer's report

Title: Evaluation of the Mortality Registry in Ecuador (2001 - 2013) - Social and Geographical Inequalities in Completeness and Quality

Version: 0 Date: 18 Jul 2018

Reviewer: Margarita Ronderos

Reviewer's report:

The authors in this paper propose to answer the question of whether there are inequalities between subnational administrative-geographical divisions in Ecuador in quality, completeness and internal consistency of death certification/registration. Ecuador's Civil registration and vital statistics system will no doubt benefit of a more detailed analysis of mortality registration completeness at the subnational level. Such estimations will allow targeting interventions for improvement, given an estimated country completeness of death registration of around 78.3 for the period 2010-2015 (OPS. 158 Sesión del Comité Ejecutivo. CE158/INF/8. Plan De Acción Regional para el Fortalecimiento de las Estadísticas Vitales y de Salud: Informe Final. 8 de Abril del 2016. Anexo). This is also of interest to a more general audience in low and middle-income countries wishing to learn on methods to estimate completeness of mortality registration.

The authors need to clarify the following issues in the methodology:

Completeness estimates:

1. The authors refer to Murray et al's (Murray CJL, Rajaratnam JK, Marcus J, Laakso T, Lopez AD (2010) What Can We Conclude from Death Registration? Improved Methods for Evaluating Completeness. PLoS Med 7(4): e1000262. doi:10.1371/journal.pmed.1000262) article for the methodology used in the Death Distribution Methods. This research clearly points to best age groups to use for each DDM and recommends that :" if an estimate of completeness must be obtained solely from the optimal DDMs at time period, then the median result across these three best age trims may be used". Peralta et al used the three DDMs: GGB, SEG and GGB-SEG to estimate completeness. They provide a summary estimate based on the harmonic mean of the three estimates and provide in table 1 for each province an age interval. In the methods section they say that " ..for each method used, DDM automatically chooses the age interval that best fits the models and minimizes the residuals…". The authors need to explain why they chose to use the harmonic mean and how they arrived at the single age interval in each province.
2. Murray et al found that the uncertainty around completeness of death registries estimates could be up to +20%. Peralta et al make no effort to estimate uncertainty bounds and overlook the fact of the possibly very important effect of age misreporting. De Lima et al, also referred to in this paper (de Lima y Queiroz Evolution of the deaths registry system in Brazil: associations with changes in the mortality profile, under-registration of death counts, and ill-defined causes of death. Cad. Saúde Pública, Rio de Janeiro, 30(8):1721-1730, ago, 2014) warn about the limitations of the application of DDMs for small areas where the assumptions inherent to these methods do not hold. The uncertainty issue is clearly important when comparing provinces in Ecuador as the difference in population size and number of deaths in the period between provinces is important, and some of the provinces have very small populations and number of deaths in the period. As the objective is to identify provinces needing strengthening of death registration or using completeness estimates to adjust for death rates and other mortality analysis, these estimates might be misleading.

Quality: Unusable causes of death during the period analysed: 2000-2013 by province could have been affected by the nature of the person certifying as explained in the paper, death certificates may be completed by health personnel (not clear if it is possible to identify if medical doctor or other), civil registrars and police authorities. It would help to interpret these results if for each province the proportion of death certificates issued by medical doctors and others could be known. It would be no surprise if provinces with ethnic and disperse rural population had less access to medical staff to certify death. This is important as the interventions needed to improve quality in the different provinces will vary according to what are the causes. These differences might also help explain the results of internal consistency obtained.

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

An article whose findings are important to those with closely related research interests

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 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