Reviewer’s report

Title: Immigrant mortality differences in Norway by reason for migration, length of stay and characteristics of sending countries. An observational study

Version: 0 Date: 28 Nov 2017

Reviewer: Ana Martinez-Donate

Reviewer’s report:

General Comments:

This paper presents the results of a study that analyzes differences in mortality between immigrants and natives in Norway. The study uses linked register data of Norwegian residents aged 25-79 at any point between 1990 and 2015. The analyses examine the role of reason for migration, age at migration, length of stay in Norway, percent of lifetime spent in Norway, and region of origin. The data and analytical strategy are strong. The results are interesting and presented in an organized and clear way. The findings represent an important contribution to the literature on migration and health. The manuscript could be improved if the introduction provided a more thorough frame for the study, including a brief description of the sociopolitical and historic context of migration in Norway and a theoretical foundation based on previous literature on migration and health. Likewise, the discussion could be strengthened by further elaborating on the possible reasons behind the pattern of associations found, as well as the contrast between the findings of this study and previous research. I provide more specific comments below.

Specific Comments:

-The introduction, particularly the review of the literature, feels somewhat fragmented and could be more effective at conveying the rationale for the study in the context of previous literature on the topic.

-On a related note, the study lacks a theoretical framework. Such foundation would be important to guide the hypotheses or research questions, provide the basis for the analyses, and help with interpretation and integration of the findings. The absence of such framework makes it difficult to integrate the multiple results presented in the paper.

-The audience of BMC Public Health is international. A little bit of background about the characteristics of the immigrant population in Norway and some contextual information about immigration policy and social attitudes about migration in Norway would also help to contextualize the study and assist readers with understanding if and how the findings may generalize to and/or have implications for other countries. There are hints on the first paragraph of Page 9 and some details appear at different points of the Discussion, but a general overview should be presented in the Introduction to provide adequate context for this study.
- Given this is a general journal, not necessarily catering to a migration expert audience, the authors should unpack the concepts of selection, cultural adaptation, and social status and elaborate a little on the known or presumed mechanisms behind the role of these variables in relation to health. Similarly, they should explain the expected role of reasons for migration, length of stay, and age at migration on mortality. This could be done as part of the theoretical framework requested in one of my previous comments.

- In Page 8, the reference to the study by Rafnsson et al. is confusing. It is not clear at all what that study found from the statement included in this manuscript.

- On the Discussion section, the results regarding lack of sex differences beg for an explanation. What can explain the contrast with findings from the U.S. and other European countries?

- What explains the more rapid increase in death risk for long-term refugees versus other types of immigrants? In general, there is limited discussion of the mechanisms that could explain the differences between refugees and labor/education migrants when it comes to the impact of age at migration and length of stay. These differences are attributed to selection effects, but there is limited mention of the pre-migration protective and risk exposures that the different types of migrants may experience (Page 13, Line 290), including pre-conception and in-utero exposures (Page 15, Line 344). The differences should also be interpreted in light of the likely different odds of return migration of these types of immigrants. See my next comment.

- The limitations note that emigration rates are different for natives compared to immigrants and this could bias the results. This phenomenon and, more specifically, the possibility that poor health may be a driver for return migration and a source of bias in studies comparing mortality in natives versus immigrant populations have been referred to as "salmon bias" in the migration literature. The authors should acknowledge this previous research more explicitly. See Palloni & Arias. Paradox Lost. Demography 2004;41(3), for example.

- In the paragraph preceding the Conclusion, the authors strongly conclude that there is evidence of health selection and that the health of immigrants in Norway is better than that of their native counterparts in Norway and the populations of their countries of origin. This is too strong a statement and a claim not directly supported by this study. First of all, the study does not use health data but mortality data (and as the authors note in the limitations, not all mortality differences reflect health differences). And, second, mortality data from the countries of origin are not included in the comparisons. I recommend toning down these statements.

- Finally, in general, the discussion is framed in a way that suggest immigrants end up having greater mortality than natives, when in reality the data suggest that immigrants show an initial advantage in mortality rates but progressively approach and ultimately reach the same mortality levels as natives in Norway. The implications of the two alternative interpretations in terms of health disparities are different and should not be interchanged.

Are the methods appropriate and well described?  
If not, please specify what is required in your comments to the authors.
Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
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