Reviewer's report

Title: Immigrants from conflict-zone countries: a comparison study of obstetric outcomes in a low-risk maternity hospital in Norway.

Version: 2
Date: 22 March 2015

Reviewer: Melanie Gibson-Helm

Reviewer's report:

Thank you for the opportunity to review this manuscript. This is a complicated field and greater clarity is needed about the impact of migration and ethnicity on pregnancy outcomes in order to reduce health disparities in resettlement countries.

This is a large retrospective study of maternal health and pregnancy outcomes with strengths that include:

1. Descriptions of health and outcomes for women from countries that have not often been described previously (Iraq and Afghanistan) and the
2. Availability of duration of residence in Norway.

However, I have some concerns that need to be addressed before a decision on publication can be reached. I hope the authors find these comments useful when revising the manuscript.

Major Compulsory Revisions

Background:

The specific research question is not clear in the Background section and so assessing whether this research makes a novel and useful contribution to the field is difficult. Please revise this section to be more concise and to focus on framing the need for this particular piece of research, the specific knowledge gap that it will address and the useful contribution it will make to the field.

For example, it is relatively well documented that Somali women are at a greater risk of perinatal complications / poor pregnancy outcomes both in Norway and in other resettlement countries. Does this research contribute new scientific knowledge because it is from a different part of Norway, is it more recent than other research worldwide or does it report some pregnancy outcomes not previously described before? Or is the major contribution the description of pregnancy outcome for women from Iraq and Afghanistan?

Methods:

How were the four conflict-zone countries defined or selected for this study? Please add further explanation of this to the Methods section. For example, when were the major peaks in numbers of refugee arrivals to Norway from each of these countries? Were the major peaks in refugee arrivals all around the same
time or were some longer ago and some more recent?

Was information from Statistics Norway or the Ministry of Foreign Affairs available to confirm whether individual women in the study sample had arrived in Norway as refugees? If not, what proportion of women would be expected to have a refugee background or be asylum seekers? Please include this information in the Methods section.

Of the women from these five countries giving birth at this hospital, were any excluded from this study?

Why was information on pregnancy care attendance and interpreter need not available? Was it because the data was sourced from the MBRN rather than the hospital itself? These are important variables and explanation in the Methods section of why they weren’t included would be helpful.

The Background discusses mental health and possible links to pregnancy outcomes. Was any information available about mental health before or during pregnancy for the study population e.g. PTSD, anxiety and depression?

Line 134-136: Please clarify what conditions were included in “health issues before pregnancy”? Currently not enough information is given about this variable for meaningful interpretation of the results. Results section and tables may also need clarification on this point too. Similarly, what conditions were included in “health issues during pregnancy”? Were bleeding, anaemia and diabetes included in “health issues during pregnancy”?

Line 148-152: When the independent variable (country of origin) has five levels/categories (Norway, Somalia, Iraq, Afghanistan, Kosovo), the correct tests to use to assess differences in prevalence for each dependent variable (background characteristics and obstetric outcomes) are one-way ANOVA or Kruskal-Wallis tests, not student’s t-tests or Mann-Whitney U tests. Comparing each country of origin to Norway means that the chances of type 1 errors are extremely high. For categorical/binary dependent variables, chi-square tests can be used but should include all levels/categories of the independent variables (i.e. all 5 countries of origin). Please adjust the manuscript accordingly after the correcting the analysis. The multivariable regression analysis will give information about which country of origin has a statistically significant association with an outcome, compared to the reference category (Norway).

Line 155: “several confounding variables were controlled for”. Please describe in the methods section which confounding variables were included in the multivariable analysis, how they were selected and how these variables were used (i.e. was age used as a continuous or categorical variable? which category of parity was used as the reference category?)

Results

Please report how many twin births there were. Were there enough twins for it to be a meaningful variable to include in the multivariable analysis?
Education level was missing for 27-34% of women from conflict zone countries but missing for 0% of Norwegian women. This indicates that education level is not missing at random and is a source of possible bias that should be noted in the limitations section of the Discussion. This missing data will also reduce the number of women included in the multivariable analysis (and the number of cases of some outcomes). This could have led to over-fitting some of the multivariable logistic regression models. I'd recommend the authors seek statistical advice about whether to:

1. remove education from the multivariable models which will allow the whole study population to be included, or
2. retain education in the multivariable models and address the resulting reduction in sample size and possible bias throughout the manuscript and tables.

One of the potential main strengths of this research is that duration of residence in Norway seems to be available. Investigating the association between this variable and pregnancy outcomes would make a very valuable contribution to this field. Is it possible to assess this by univariable regression analysis and add it to the multivariable regression models (when sample size permits)?

Table 2: I am concerned that the multivariable model for Apgar score has been overfit. Table 2 indicates that age, parity, marital status, education level, twin birth and at least 3 countries of origin were included (resulting in at least 8 odds ratios being generated) but there were only 72 cases (and probably less than 72 because women missing education data will have been excluded from the multivariable analysis). This concern is also suggested by the very wide 95% confidence intervals for Apgar score. Please reduce the number of covariates included in this model and please check the other multivariable models for over-fitting.

Discussion:

Line 211-214: “This suggests that there are not many similarities among women from Somalia and women from the three other conflict-zone countries.” This conclusion is too strong as currently phrased. The group of women from Somalia was much larger than the other groups and so more accurate estimates of associations (narrower 95% confidence intervals) were possible. Therefore small but statistically significant associations are more likely to be observed in this group. This alternative explanation should be taken into account.

Please revise the Discussion section to focus on the main research question, the primary purpose of the research and the novel/useful contribution it makes to the field. Overall, as it is currently, this section discusses issues related to migrant groups in general rather than refugee-specific issues. For example, while the Discussion does mention possible differences between conflict zones, more discussion of these aspects is warranted.

Line 249-258: The section on khat chewing detracts from other sections that have a stronger evidence-base and are more related to migration from conflict
zones. I recommend this Discussion section is removed. The manuscript presents no data on dietary practices or khat chewing but does present a number of results indicating that women from Somalia may experience significant social disadvantage; these could be discussed as possible contributors to anaemia and low birth weight instead.

Line 260: “This has been explained by their poor language proficiency, low education, and higher rate of teenage pregnancies.” Please rephrase this to be clear that while these are contributors to later first care they will not be the only contributors in every migrant group. Health literacy, understanding of the health system and system-level barriers such as availability of culturally-appropriate care and past negative experiences of pregnancy care will also be contributors.

Line 278: “Interpreters, however, are not used during labor in our maternity ward.” Does this mean that qualified interpreters are never used during labour at Baerum Hospital? The possible impact of this on the reported outcomes (such as epidural analgesia) should be discussed earlier in the Discussion section.

The Conclusion is appropriate and fairly reflects the key findings and implications of this research.

Minor Essential Revisions

Abstract:

Please report the number of women in each group, and the standard deviation of birth weight.

Please report the actual prevalence, odds ratios and 95% confidence intervals for the key findings. This may mean that fewer results can be presented in the abstract in order to stay within the journal’s abstract word limit.

Methods:

Line 135: Please clarify what “not in pregnancy journal” means.

If “icterus” is being used in place of “jaundice”, I’d recommend using jaundice as a more audience-friendly term.

Were ethnic Norwegians all born in Norway or did this group include women born overseas and had migrated to Norway but who had Norwegian parents?

Tables:

Both table headings should adequately describe the contents of the table without reference to the text. For example, the first sentence of the first footnote of Table 2 would be an adequate Table 2 heading. Please refer to “women” rather than “subjects”.

Table 1: Rates of diabetes in pregnancy seem quite low; is diabetes screening part of routine pregnancy care? Also please specify that the table refers to type 2 diabetes mellitus and gestational diabetes but not type 1 diabetes mellitus as the Methods section (Line 120-122) indicates women with type 1 were referred to
specialist care and did not give birth at Baerum Hospital.

Table 1: Please spell out “para+1”

Table 2: Please indicate the countries of origin of the women who had the 16 stillbirths.

Table 2: Why was pregnancy length presented in days rather than weeks?

Both tables: The abstract and first line of the Results section say 7409 women but the tables report 7408 women, please correct as necessary.

Results:
Please report how many teenage pregnancies were in each group.

In both the tables and the text, whenever presenting median please also present interquartile range (25th and 75th percentile) and whenever presenting mean please also present standard deviation.

Line 185-186, reduction in smoking was not actually tested so more appropriate phrasing may be “smaller proportions of women in all groups reported smoking at the end of pregnancy than at the start of the pregnancy.”

Line 207 “… but after adjusting for confounding variables, this difference disappeared.” This sentence needs to be rephrased to reflect that multivariable logistic regression analysis tests associations not differences and the associations were not statistically significant rather than disappeared.

Line 219-221: “Women from Iraq and Afghanistan differed from the Norwegians in pregnancy length and mean birth weight. However, they did not have more preterm births (350-366 weeks) or LBW babies.” It is plausible that this is because the sample size in these groups was not large enough to detect possible associations for binary outcomes which generally will require larger sample sizes than continuous outcomes. This could be noted in the Discussion section.

Throughout the Discussion section: When discussing other research please note which country it was conducted in e.g. Line 227: Does this refer to a study in Norway, Afghanistan or another country?

Line 268: “Non-Western women were less likely to attend the antenatal program and to follow recommendations.” Please rephrase this sentence as it could be considered to be somewhat pejorative.

Line 333: “…a high immigrant participation in the public health systems. Women are therefore most likely to have received the same treatment, guided by the same policies and procedures at the hospital.” The meaning of this statement is not immediately clear. Does this mean that the maternity service is located in an area with a relatively large migrant population? Please rephrase for clarity.
Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests