Reviewer's report

Title: Increase in prevalence of birth defects in an Arctic Russian setting from 1973 to 2011: a register-based study

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Reviewer: Peter Bjerregaard

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This is a generally well written manuscript about birth defects in Monchegorsk, Russia, based on two registries, one of which was established retrospectively for 1973 to 1998.

The conclusion states that the reported prevalence of birth defects was higher in Monchegorsk than in Europe and that the prevalence increases over time. It is accordingly necessary to ask the following questions:

1) are the prevalences higher those reported from Europe?
Maybe, but I miss statistical comparisons. In line 201-203 is stated that certain disparities between Monchegorsk and Norway are unlikely to be statistically significant, but are they or are they not? The attempt at an explanation by population size is invalid.

2) do rates increase over time?
They do significantly for all causes but I suggest to include p for trend values in tables 4 and 5. A very substantial part of the increase is due to malformations of the urinary system; this was discussed briefly but a more detailed discussion is warranted. What precise conditions are we talking about? What would the trend be if malformations of the urinary system were left out?

3) is the increase real?
How much can be explained by changing coding practice? In line 209-211 the trends are in part explained by changes in the health care system and other relevant structural changes. This is important and could be expanded somewhat. I believe that most of the explanation lies here.

4) finally, if there is a biological increase, what might the explanations be?
Environmental factors are presented along with maternal age, smoking and alcohol. No need to add anything to this.

Further comments

Line 68. Why are the estimates of BD prevalence not comparable with European registers?

Line 90. There was no commonality..... I don’t understand this.
Line 99. The introduction should contain a precise purpose of the study/the article.

Methods: Is it realistic that the two different registries are truly comparable?

Line 181-184. The explanation is probably that a comparison is made between
data from a dedicated study and routinely collected data.

General:
It is suggested to keep only one decimal for prevalences in order not to inflate the
precision of the estimates.
Please check the language carefully, for instance the use of “abortuses” instead
of abortions etc.

Level of interest: An article whose findings are important to those with closely
related research interests

Quality of written English: Needs some language corrections before being
published

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

Declaration of competing interests:
I have no competing interests