Reviewer's report

Title: Demographic relevancy of increased use of assisted reproduction in European countries

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Reviewer: Mark Connolly

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The analysis described here attempts to understand the relationship between demographic impact of assisted reproduction. This is an important piece of work that contributes to the policy sphere which can influence fertility policy. This is particularly important as many health services consider making savings and changes to fertility policy. Whilst this is an important piece of research the paper could benefit from some clarity and more balance Discussion.

Methods

Point of clarification.

It would be useful if the authors could explain whether the FPR ratio is derived from all births in a country or only those related to ART. If the FPR is constructed from all national births, I would think this analysis is invalid because ART only represents a small percentage of national births. Many cultural, economic and social policies are likely to influence FPR.

Results

The cross-national comparison is perhaps most useful as it attempts to discuss several years of data generation from the EIM.

One of the more worrying areas of work is the correlation between TFR and data on cycles per million. It needs to be clarified if this is TFR for the entire country or only those that had fertility treatments. If this reflects the entire country level TFR it needs to be discussed how this relates to a minority of people treated with ART. Because TFR is influenced by so many factors this data is only for descriptive purposes. The correlation does not establish a causative relationship. Perhaps the paper could benefit from removal of the correlations and simply include the plots allowing the readers to interpret the data for themselves. Furthermore, if the correlations are left in the manuscript a limitations of this approach must be described in the Methods and Discussion in the results section.

Perhaps in the weaknesses section it would be useful to explain which other factors can influence TFR.

Discussion

First paragraph of Discussion. This paper has not proven that inequalities exist. Without knowing underling medical need you can't make this claim and even if the medical need were the same it does not necessarily imply that people will
want treatment at the same rate in different countries.

The authors of this study discuss the important impact of reimbursement on fertility treatment. Previous studies have explored this relationship and reported more ART births in older mothers. These results are worth contrasting with the findings observed in this study and potential explanations for these potential differences. See the work by Lucie Schmidt:


In the final paragraph of the Discussion the authors describe the importance of reimbursement on access and utilization. This is relevant discussion but can’t be linked with the results shown in this paper, although it is somehow implied in the discussion. It would be helpful to mention that this work does not consider reimbursement as a determinant on births and treatment cycles.

**Level of interest:** An article of importance in its field

**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.