**Reviewer’s report**

**Title:** Can the Health Effects of Widely-Held Societal Norms be Evaluated? An Analysis of the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (UN-CEDAW)

**Version:** 0  **Date:** 20 Dec 2018

**Reviewer:** Chenoa Allen

**Reviewer's report:**


This study uses country-level data from multiple databases to examine whether indicators of women's health (life expectancy and mortality rate) improve after a country ratifies the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Using interrupted time series methods that exploit variation in timing of ratification across countries, the authors find that ratification leads to improvements in women's health in low-income democratic countries and in high income countries, regardless of the level of 'political democracy.' The article is well-written, the analysis is rigorous, and the research question - do human rights declarations have measurable impacts on health and wellbeing? - is important. The manuscript could be strengthened by adding a conceptual framework (how might CEDAW ratification promote health?) and by adding a discussion of major threats to validity for the ITS method and how they are addressed in the analysis.

**Major comments:**

1. In both the introduction and discussion, the article warrants more detail on proposed mechanisms by which CEDAW might impact health. Do the authors expect instrumental effects (e.g., gender parity in income and education), symbolic effects, or both?

   a) If instrumental effects, have any studies examined whether CEDAW improved material circumstances for women? And/or are relevant variables available to test as mediators?

   b) Based on expected mechanisms, did the authors have hypotheses about post-ratification trends? e.g., did they expect to see changes in health emerge immediately, or after some lag? Do the observed trends support one mechanism over another?
c) How and why were the effect modifiers (democratization and low/middle/high income) chosen? Are there differences across countries based on income/democratization that could explain why effects are observed in some and not others?

d) Could / should men be used as a sensitivity check? Or would the authors expect spillover effects for men as well?

2. The authors should discuss major threats to validity and how they are addressed by the model and/or through sensitivity analyses.

   a) The fact that different countries ratified CEDAW in different years is an advantage. Although there is no unexposed comparison group, pre-ratification trends in late-adopting countries do serve as a sort of comparison group for early-adopters. (see, e.g., Goodman-Bacon, "DIFFERENCE-IN-DIFFERENCES WITH VARIATION IN TREATMENT TIMING")

   b) The authors should address the potential for confounding by other, concurrent events (at the national, regional, or worldwide level). What are major potential confounders that vary over time and are related to women's health? The authors should think through this and conduct sensitivity analyses controlling for possible confounders. Different timing of ratification helps with this potential source of bias, but doesn't eliminate it.

   c) Related to (b), I am not sure I understand the claim on pg. 9 (l. 148-149) that longer pre-ratification trends would be more likely to be "contaminated by other societal changes." This implies that the pre- and post-ratification periods used aren't "contaminated," which they likely are (an unavoidable limitation of most natural experiments).

Minor comments

3. Which, if any, variables are time-varying? Did countries move between categories of income and democratization over time?

4. Is mortality age-adjusted?

5. I would like more details about the distribution of ratification year (either number of countries ratifying each year or mean (standard deviation) of ratification year) and whether timing of ratification differs significantly across the groups for stratified analyses.
6. A bit more detail on joinpoint analysis would be helpful. How is time modeled (a series of linear trends? Quadratic / cubic / etc. transformations?)? Does the analyst pre-specify the number (or a maximum number) of inflection points?

7. p. 11, l. 184 - 185: the sentence lists two different values for "low-income countries;" one must be mislabeled. Figure 2: graphs for middle-income countries are presented twice, high-income countries aren't shown.

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.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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