Author's response to reviews

Title: Determinants of Unwanted Pregnancies in India Using Matched Case-Control Designs

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Version: 2 Date: 17 July 2012

Author's response to reviews: see over
List of Changes in Revised Manuscript

Determinants of Unwanted Pregnancies in India Using Matched Case-Control Designs

Reviewer #1: comments

QUERY 1

1. The hypothesis posed by the authors is clearly defined & has merit. As mentioned under Methods in abstract as well, “This paper attempts to examine the associated factors of unwanted births, without matching the village and after matching the village, by using the matching case-control design”, to make the title convey more accurately what has been done, it can be modified as “Determinants of Unwanted Pregnancies in India Using Matched Case-Control Designs”. It may obviously be better to call unwanted pregnancy instead of unwanted birth.

Explanation 1

We have modified the title of the manuscript according to the suggestion received from the reviewer. The title of the Manuscript would be “Determinants of Unwanted Pregnancies in India Using Matched Case-Control Designs”. Also we have replaced the unwanted birth with unwanted pregnancy in the text.

QUERY 2

2. They need to include current references on topic while describing available review of literature. For example, “Begum S, Dwivedi SN, Pandey A. On optimum numbers of controls under case control studies on unwanted pregnancies: an analytical appraisal. Statistics in Transition, 2008; 9(1):117-128”.

Explanation 2

In the manuscript we have included the literature such as


**QUERY 3**

3. The methods are conventionally appropriate but not well-described. As described under Methods, it is mentioned that Frequency as well as pair matching were used to consider the controls. It’s not explained why they have used both procedures? Why not one of them?

**Explanation 3**

As per the reviewer’s suggestion we have added in the methodology part that, why we have used both the procedures.

The aim of this paper is to examine the associated factors of unwanted pregnancy, without matching the village (PSU) and after matching the PSU, by using the matching case-control design.

To deal the issue “without matching the village and after matching the village” we have applied frequency as well as pair matching. Further, to analyze the determinants of unwanted pregnancies, first we have performed the frequency matching by taking women’s age as a confounding variable and applied unconditional logistic regression. As literature shows that women’s age is one of the important confounding factor in explaining the issue of unwanted births (Begum et al. 2008; Eggleston, 2000; Shaheen et al. 1999; Adetunji, 1997). With the help of this technique, we are in a position to find out the factors affecting unwanted pregnancy without doing the pair matching by village.

After that to deal with the complex hierarchical inter-relationship between the variables, we have performed paired matching and using women’s age and region (village-PSU (which is the lowest geographical boundary)) as a matching variables. Finally we have applied conditional logistic regression, which is useful in explaining the factors affecting unwanted pregnancy after
controlling PSU (unobserved heterogeneity) level variation. Moreover in the absence of village level information in the recent round of NFHS-3 data, the PSU level matching helps in controlling the many socio-cultural, environmental and programme level factors. At the last the aim is also to compare the obtained results with the help of both matching methods.

**QUERY 4**

4. Further, since major emphasis of this article is on matched design, they need to explain under methods, why matched design might be a better choice than unmatched design, with suitable references.

**Explanation 4**

According to the suggestion we have tried to explain the advantage of matching case-control design over unmatched design, under the methodology section, which is given below.

The advantage of matching case control design over unmatched design is that if the distributions of a confounder are substantially different in cases and controls, matched case-control studies control for confounding by introducing stratification in the study design (Rose S, Der Laan MJV, 2009; Breslow and Day, 1980). Matching study can increase the efficiency of the study by balancing strata which overcomes sparse-data problem and it gives the maximum information even when sample size is small.

**QUERY 5**

Under Analysis (Frequency Matching), it is mentioned that “After selection of case and controls in frequency matched case control design, the data satisfy the conditions of unconditional logistic regression model.” Instead of this, one needs to write about required conditions & their fulfilments.

Under Major Compulsory Revisions, it needs to be elaborated because suitability of analytical method depends on study design only. Inappropriate analytical methods can lead to distortion in results.

**Explanation 5**

We have included the required condition of unconditional logistic regression with suitable reference in the method section. This is given below

**Frequency matching:** After selection of case and controls in frequency matched case control design, the two groups of the data are still different except for the matching variable, which

**QUERY 6**

The data are as such sound. They have used data from the ‘National Family Health Survey’ round three (NFHS-3) conducted in 2005-06, spread over across the states and union territories of India. The authors have tried to investigate the factors associated with unwanted pregnancies using a nationally representative, large-scale population-based dataset. However, matching design adds artificial nature in distributions of matched factors. To be more specific, in present case, age of the sampled respondents regarding wanted pregnancy (table 2 & 3) has different distribution than its original distribution (table 1). Hence point 5 mentioned-above becomes more relevant.

**Explanation 6**

We have explained the point 5 in the methodology section.

**QUERY 7**

This manuscript has adhered to the relevant standards for reporting and data deposition, specially considered data & absolute frequency (not only %) in a desired manner. But, the tables 1 & 2 need to be pooled in one table appropriately.

**Explanation 7**

As per the suggestion we have pooled Table 1 and 2 in Table 1.

**QUERY 8**

In tables 3 & 4, once 95% confidence interval is included, there is no much use of reporting p-values in the last columns. They need to be deleted. Further, for comparability of results, tables 3 & 4 also need to be reported in one table appropriately.

**Explanation 8**

According to suggestion we have excluded p-values from the Table 3 and 4. Furthermore we have presented Table 3 and 4 together for the purpose of comparability.

**QUERY 9**

The discussion and conclusions also need to be updated after revision of the article.
Explaination 9
We have revised the discussion and conclusion of the manuscript.

QUERY 10
The limitations of the work also need to be updated after revision of the article.

Explaination 10
We have also mentioned the limitations of the work, which is given below

The NFHS is a cross-sectional survey that looked retrospectively at women’s pregnancy intention and its related factors. Our study results should be cautiously interpreted in view of the limitations of the cross-sectional design. Another major limitation of our study is that information was not collected on several factors, such as accessibility and availability of health facility at the village level that might influence the relationship between pregnancy intention status and predictor variables. Although, an attempt has been made to control this information through paired matching design, we are not able to find out the association of these variables with unwanted births. Lastly, this study is based only on unwanted births, but a study of factors affecting mistimed birth is also important for healthy society. Owing to the small size of the sample, we are not able to analyse this component separately.

QUERY 11
The authors need to clearly acknowledge any work upon which they are building.

Explaination 11
In the revised manuscript we have added a new reference where case-control studies have been applied in the Indian data in addition to “Begum S, Dwivedi SN, Pandey A, Mittal S: Association between domestic violence and unintended pregnancies in India: findings from the National Family Health Survey-2 data. The National Medical Journal of India 2010, 23(4):198-200.” study. The new reference is


Reviewer #2: comments

QUERY 1
I would suggest to slightly revise the title as "Unwanted Births in India: Issues and challenges" which authors may or may not accept.
Explanation 1

As per first reviewer’s suggestion we have changed the title of the manuscript. The title of the Manuscript would be “Determinants of Unwanted Pregnancies in India Using Matched Case-Control Designs”.

Acknowledgements

The authors are grateful to the two reviewers, who provided valuable comments and suggestions on earlier version of our work, which helped immensely in improving the quality of the paper.