Author’s response to reviews

Title: A minority of thousands? Prospective study of determinants and costs of home births in Mumbai slums

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Version: 2 Date: 18 May 2010

Author’s response to reviews:

MS: 6317690003539235
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Responses to reviewers’ comments

We thank the reviewers for their generally favourable responses and for their constructive comments, which we address point by point below. We note that all the recommendations of Reviewer 1 were compulsory or essential, and have tried to respond to them fully, while pointing out that this might not always have been possible. Reviewer 2 made recommendations for discretionary changes.

Reviewer 1

1. Is the question posed by the authors well defined?

“A minority of thousands? Prospective study of home births in Mumbai” In my opinion this title is not a suitable though the authors attempted to convey it as a main message. The title fails to convey the specific issue or item about home births being reported in the manuscript.

Response: we have changed the title:

“A minority of thousands? Prospective study of determinants and costs of home births in Mumbai”

Since there are a number of reports about care practices, but not many about determinants of and costs for home delivery is new message from this manuscript. The authors did not report quantitatively, situations (circumstances), in which women are likely to deliver at home. Is this conveyed in the scatter plots or the multivariate analysis? Is this statement same as factors influencing home delivery?
Response: We have reviewed the Results and Discussion sections, and feel that they did make the required points. For example, in the Discussion section, we being by saying 'Home births were more likely for parous poorer women with less education, living in insubstantial homes in slum areas with high rates of migration and hazardous location.' The reviewer is right that the determinants were conveyed by the scatterplots and multivariable analysis. Nevertheless, we have revised the multivariable regression analysis and altered the text to communicate as much as we can about the determinants.

2. Are the methods appropriate and well described?

In the main manuscript authors may choose to write Prospective key informant surveillance of vitals events. I find this methodology to be nearly same as another article i have read in the same journal.

Response: We have made a mention of this in the Methods section:
‘… a prospective, key informant vital registration system was set up to identify births, stillbirths, neonatal deaths, infant deaths, and maternal deaths.’

In abstract a few more details about methods as said above, including a brief note about analysis carried out would be useful for the reader.

Response: We have included more details in the abstract:
‘As part of the City Initiative for Newborn Health, we used a key informant surveillance system to identify births prospectively in 48 slum communities in six wards of Mumbai, covering a population of 280 000. Births and outcomes were documented prospectively by local women and mothers were interviewed in detail at six weeks after delivery. We examined the prevalence of home births, and their associations with potential determinants using regression models.’

3. Are the data sound?

Yes,

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

In abstract statement “Hygiene practices were better than reported previously.” This sounds like discussion in the abstract this statement may not be required.

Response: We have removed the statement.

In abstract “70% of home deliveries were assisted by a......” when a sentence starts with number should be spelled out.

Response: Amended.

The estimation of home births may better suit into results section both in abstract and manuscript. According authors objectives, the main theme of manuscript is factors affecting home deliveries, which should be emphasised, and also is the cost.
Response: We think we understand what the reviewer is suggesting. However, the estimates are not part of the analysis, but are made to underline the implications of the findings. It is conceivable that they could be moved from the conclusion to the discussion section. To be honest, we really like the way the paper flows and are not particularly keen to do this.

“We did not find significant differences in stillbirth or neonatal mortality rates between home and institutional deliveries (data not presented here)”. As no further details or data is resented here and does not confine within the objectives of this report authors may choose to omit this statement to keep the manuscript focused on the objective.

Response: this is a fair point. In fact, we included the statement because we had a strong suspicion that readers might ask about it. It seems likely to us that readers will say that the big issue is that home births are dangerous. We included the statement for this reason and, on balance, we think it should stay in.

5. Are the discussion and conclusions well balanced and adequately supported by the data?

In abstract, “Since cost is not a dominant disincentive to institutional delivery, it might be productive to concentrate on intensive outreach in vulnerable areas by community-based health workers who could help women to plan their deliveries and make sure that they get help in time; and on efforts to improve the client experience at public sector institutions.” Is too long

Response: we have amended the section:

‘Since cost does not appear to be a dominant disincentive to institutional delivery, efforts are needed to improve the client experience at public sector institutions. It might also be productive to concentrate on intensive outreach in vulnerable areas by community-based health workers, who could play a greater part in helping women plan their deliveries and making sure that they get help in time.’

6. Are limitations of the work clearly stated?

I do not see any limitations being stated. However, as interviewers collected this data from mothers 42 days after birth. There could have been some information bias due to recall from the events, or money spent may not be accurately reported. Were there any vital events i.e. which went unreported? The authors may admit to these limitations. Also there could have been more than one reason for home delivery which is not addressed. The best way to find out why women choose to deliver at home is by qualitative methods. Also acknowledge this as a limitation

Response: Although there was a statement of limitations, we have added to it to answer both these comments:

‘Limits to the study included the sampling frame, cluster size, loss to follow-up, the omission of certain groups such as pavement dwellers, and the methods used to assess poverty. There was a possibility of reporting bias because
interviews were done six weeks after delivery. The cost estimates are at best indicative, since women may not themselves have made payments and since recall is likely to have been difficult. A further limitation was that the reasons for home delivery were recorded as open answers to a brief question within a quantitative interview. This makes them potentially superficial and limits our ability to interrogate the drivers of choice. A better understanding would undoubtedly be gained through qualitative methods such as semi-structured interviews, and we are undertaking a range of qualitative work in our current efforts to understand urban health from a women’s perspective. We also intend to examine cause-specific mortality in a subsequent analysis, particularly as regards the case-mix of home and institutional deliveries.’

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
Yes, they do acknowledge in the background. I feel it is important for the authors state from which main research this article has evolved in abstract also.

Response: A statement has been added to the abstract.
‘As part of the City Initiative for Newborn Health…’

8. Do the title and abstract accurately convey what has been found?
See above for the comment made earlier

Response: We have amended the title according to the earlier comment.
‘A minority of thousands? Prospective study of determinants and costs of home births in Mumbai slums.’

9. Is the writing acceptable?
Yes, a few typos here and there the authors can edit them during revisions.

Response: we hope there are no typos.

- Major Compulsory Revisions
Authors mention about verbal consent from women but not ethical approval obtained for original community trial.

Response: apologies, this was an oversight we should not have made. We have added the following:
‘Data for the study originated from a trial approved by the Municipal Corporation of Greater Mumbai, the Independent Ethics Committee for Research on Human Subjects (Mumbai committee, reference IEC/06/31), and the ethics committee of the Institute of Child Health and Great Ormond Street Hospital for Children.’

Did the authors include all vital events for this report? How did authors consider in the event of maternal, neonatal death or still birth? Did you include for this analysis. In this regard under results it would be nice to read a flow chart, of surveillance data and how 1708 home births were analysed.
Response: We have added a flow chart and described it in the Results section:

‘We identified 13 467 births from 1st October 2005 to 30th September 2007 (Figure 1). Neonatal outcomes were known for 11 209 births, and 2258 were lost to follow-up. The main reasons for loss were that families moved out of the study area or that women who had come to the city for maternity went back to their marital homes elsewhere. We were able to collect detailed information on 10 754 births (79%), which included 9046 institutional deliveries (77% of those identified) and 1708 home deliveries (97%).’

Table 4: Explain as foot note here or in methods how you calculated quintile. One important factors determining place of delivery i antenatal care. Can the authors these factors in the multivariable analysis. And also is presence or absence any complication/s i.e. “high risk category”

Response: We have reviewed the Methods section (statistical analysis) and feel that we have provided the usual level of information about how asset-based quintiles socioeconomic were derived:

‘We used asset scores, ordered and divided by quintiles, to describe socioeconomic status. Individual scores were assigned to respondents on the basis of standardised weights for the first component of a principal components analysis in Stata 10 (College Station, TX, USA).[16, 17] Assets included a range of consumer durables and house ownership, house construction, possession of a ration card, source of electricity, and type of toilet.’

We did not find many cases of high risk pregnancy and we have included a brief note on this in the Discussion section:

‘Few women reported severe complications at the time of delivery. One of the possibilities may be that access to facilities deters women at risk from delivering at home, or that immediate medical intervention is provided in case of last minute complications. Dais may also not want to take risks and refer mothers at the slightest hint of complications.’

We have also revised the multivariable regression to include antenatal care, as recommended by the other reviewer.

Most importantly in table 4 all 3 socio-economic factors are “HIGHLY SIGNIFICANT” i mean very strong predictors. Authors may think why it is so. I feel all the 3 factors are highly correlated i.e.multicollinearity and same is the case with, Environmental factors Kaccha house, water and electricity also Strong predictors like socioeconomic factors mentioned above. These are also strongly correlated. I think environmental factors depend on INCOME; i may call them PROXY INDICATORS of INCOME.

Response: Well, yes. Socioeconomic status, demographic and environmental factors are mutually associated and mutually confounding. This is a central issue in the urban health discourse. And, indeed, it is possible that after adjusting for socioeconomic status there could be residual confounding. Socioeconomic asset scores are at best crude. We allude to this nexus of determinants in the discussion section.
I would suggest following rearrangement of tables according to main objective of this manuscript.

Table 1. Frequency and proportion of institutional and home delivery, for 10 754 deliveries in 48 Mumbai slum areas, 2005-2007

Table 2. Characteristics of respondents, comparing home births with institutional births, for 10754 deliveries in 48 Mumbai slum areas, 2005-2007

Table 3. Univariable and multivariable random effects logistic regression models with home delivery as the dependent variable, for 10 754 deliveries in 48 Mumbai slum areas, 2005-2007

Table 4. Expenditure on care for normal delivery described by 1204 women, in 48 Mumbai slum areas, January – March 2007

Table 5. Reasons given for home delivery, in 48 Mumbai slum areas, 2005-2007

Response: We have changed the order of the tables and figures to the following:

Figure 1. Study flow chart.

Table 1. Frequency and proportion of institutional and home delivery, for 10 754 deliveries in 48 Mumbai slum areas, 2005-2007.

Table 2. Characteristics of respondents, comparing home births with institutional births, for 10 754 deliveries in 48 Mumbai slum areas, 2005-2007.

Figure 2. Scatterplots of home births (%, as y axis) against nine independent cluster-level variables, for 10 754 deliveries in 48 Mumbai slum areas, 2005-2007.

Table 3. Univariable and multivariable random effects logistic regression models with home delivery as the dependent variable, for 10 754 deliveries in 48 Mumbai slum areas, 2005-2007.


Table 5. Expenditure on care for normal delivery described by 1204 women, in 48 Mumbai slum areas, January – March 2007.

This generally accords with the reviewer’s suggestions, although we have kept the table on expenditure last to fit with the flow of the paper.

Minor Essential Revisions

The last sentence of background i.e. objective is not clear. I would write this as follows: In this manuscript we are reporting the proportion and estimate of home deliveries, determinants of home deliveries, self-reported reasons for, costs of, and care practices during home deliveries.

Response: We have rewritten the objectives along the lines suggested by the author.

‘We wanted to explore factors influencing the choice of home delivery, care practices and costs. We also wanted to identify characteristics of women, households and the environment which might increase the likelihood of home deliveries.'
Methods:
“The surveillance system from which data were drawn has been described elsewhere”. I have read these articles. However, it would be better if the time lines of your surveillance are mentioned here.

Response: We have mentioned the time line in the results section and feel that putting it again in the methods will make it repetitive.

The authors state, descriptive analysis... when the authors ‘ main objectives are factors for home delivery, and the costing of home and hospital births.

Response: We have mentioned this in the background. However, we have included two sentences in the Methods section:
‘The study involved a descriptive analysis of determinants of home births over two years in 48 vulnerable urban clusters. It also examined the expenditure involved in delivery care.’

Results:
Table 2: ...............“ This is probably explained by the fact that registration is an automatic component of antenatal care, rather than a clear statement of intent”. Such interpretations should rather be made in discussion.

Response: We have moved this comment to the Discussion section.

Table 3:....................Explain only results here. First 6 lines under this paragraph should be written in methods not in results.

Response: We disagree. The lines explain how we went from the univariable to the multivariable analysis. The reader is looking at the table and trying to understand it. We think that it would not be helpful to explain what we did in the methods section because the reader would not know what we were talking about. It is common practice to go into more detail about the methods when the reader is concentrating on the results section.

Discussion:

The authors refer to living conditions of these urban slums etc while interpreting their results. It would benefit the reader if to interpret all other results of this report if these are briefly described under, methods and participants i.e. study location and population.

Response: We have added a brief description of conditions to the Methods section:
‘Eighteen out of the 48 areas involved in the study were situated on or beside hazardous locations like railway lines, garbage dumps and polluted bodies of water. A substantial proportion of households did not have metered electric supply (28%), access to individual or communal piped water (21%) or individual toilet facilities (94%). Twenty-six percent of houses were of insubstantial
construction (data from City Initiative, unpublished).

Page 11, 2nd paragraph: Table about Reasons for home delivery may be dichotomized as Inside Mumbai and outside. You emphasize about these differences here.

Response: This is a reasonable suggestion, but the major reasons were similar in both locations and the numbers are not great. We think that dichotomizing the table would not be particularly interesting. We have added information to the Results section on the differences in duration of stay and parity.

As commented earlier, authors may consider writing this projected number of home deliveries in this urban slum population in the results section. Specifically after, table 1.

Response: See earlier response.

- Discretionary Revisions

Reviewer 2

1. Major compulsory revisions: none

2. Minor essential revisions: none

3. Discretionary revisions

a. This seems to have been a good study, but the information pulled out to look at reasons women so or don’t delivery in facilities seems pretty superficial. If there is more qualitative data I think presentation and analysis of that would contribute to the knowledge and potentially to interventions to promote use of facilities.

-I think far too much of the paper and analysis focuses on details of socio-economic status of the women and almost all of the logistic regression variables link with economic status. It seems that one economic status indicator or classifications should be used making this a categorical variable rather than multiple "independent" variables. A statistician might have more to say about this. It would be interesting to look at differences in use of facilities among women with the same socio-economic status and to include other variables related to some of the issues discussed below.

Response: Although we do have qualitative information on maternity care practices, it derives from our wider work and not from the research presented in the paper. The reviewer’s suggestion of more depth in the discussion of reasons for home delivery comes up in the comments below and we have responded to it there.

As regards socioeconomic status, the multivariable regression analysis in Table 3 includes a single index of socioeconomic status (the asset score) and the presentation of data in Table 2 uses this variable as a categorical quintile-based example. The multivariable analysis goes some way to address the reviewer’s
comments as it suggests that, after adjusting for socioeconomic status, a number of other factors influenced home delivery (literacy, age, parity, housing, local migration, hazardous location). We agree that the choice of health care facility is interesting and have explored it further in another paper which is under review elsewhere. In the paper we show strong effects of residential location on site of health care in both private and public sectors.

1. Characteristics of the women who returned to their home outside Mumbai for delivery. How were these women different from those who stayed in Mumbai? In Dhaka it was primarily primipara's who returned to the maternal home for delivery and the subcultural plot was so her family would bear the cost of this higher-risk more likely to require help- delivery- so this was a "custom" financial issue.

Response: We have added text on this to the Results section:
‘Women who left the city for delivery tended to have been living there for a shorter time (37% for less than one year; 306/829), compared with women who delivered in Mumbai (13%; 113/879). Women having their first baby were also more likely to return to places outside the city (26%; 211/829) compared with multiparous women (11%; 95/879).’

2. If there's more qualitative or specific information on the "custom" reasons for home delivery - that would be valuable and much more useful in understanding reasons for home delivery. For example was the "custom" referring to the religious belief that the woman must be modest and cannot receive care from men or outside the household where she will be seen; was "custom" to deliver in the hospital because of delivery "polluting" the household and slum areas not having a separate place for the polluting delivery to take place beliefs (I found this for Hindus in Dhaka); or is custom related to general lack of familiarity/lack of use of health services?

Response: Although we know something about this, we have no information on it in the data used for the analysis. It is certainly something we are interested in understanding as part of our work programme. We have added text on the nature of this limitation to the Discussion section.

3. Why was ANC not put in the logistic regression? Was it not significant after controlling for SES and education? It might be that looking at the number of ANC visits, rather than only <3 might be more informative. I found in Dhaka after controlling for multiple factors that women who had received any antenatal care were more likely to delivery in a facility- both electively and for emergency when they started delivery at home- we proposed that familiarity reduced many of the fear and custom barriers. This has great implications for how to target these women not just in planning for delivery, but in trying to bring them into the formal sector health services early in pregnancy.

Response: the interesting fact is that such a high proportion of women have antenatal care that it seemed more meaningful to set a level based on WHO minimum guidelines. There was no substantial difference between doing this and using a variable for any antenatal care.
The reason that we excluded antenatal care from the multivariable analysis was that we did not see it as a determinant of the same sort as socioeconomic status, environment or demography. It is more like an outcome, although it is true that it may itself be a determinant of subsequent institutional delivery. We can see that this could be confusing for readers, and have rerun the multivariable analysis to include it. The relevant table has been redrafted. We have also amended the text of the Results section:

‘Antenatal care was so common (93% made at least one visit) that we chose to use the WHO recommendation of a minimum of three visits as an independent variable. Making less than three antenatal care visits was strongly associated with subsequent home delivery in univariable analysis, although the effect was attenuated by adjustment for potential confounders (with a reduction in odds ratio from 11.9 to 2.7).’

4. The reasons for home deliveries such as 1) fear/poor perception of facilities; 2) lack of support (family refusal, no one to care for other children; no one to accompany her); and 3) access barriers (facility not near by; not registered; lack of transport; insufficient documents) actually add up to a substantial proportion of reasons women gave for delivering at home. If there’s more qualitative information on these, or more analysis can show characteristics of the women who expressed these reasons, that would also be useful.

Response: We are afraid that we do not have qualitative information on these issues. We have looked at a breakdown of women who gave different answers and added text to the Results section:

‘Lack of family support was a more common reason given by Muslim (17%; 154/900) than by Hindu women (10%; 69/678). This was also true for multiparous (18%; 151/884), than for primiparous women (10%; 72/734).’

c. I do think the finding about direct cost not being a major barrier is useful. Indirect costs, however, may be a major barrier- particularly when you look at the proportion of women where what could be defined as lack of family support and logistics is an issue.

Response: This is a good point and we have added a mention of it to the discussion section, as well as making small amendments elsewhere mentioning direct and indirect costs:

‘Other disincentives to institutional delivery include the fact that a woman might have to struggle to find someone to look after the house and other children while she is away, or to accompany her to the hospital.’