Author's response to reviews

Title: Determinants of the number of antenatal visits in a metropolitan region

Authors:

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Author's response to reviews: see over
Dear editor,

We received the reviewers’ comments on our manuscript: ‘Determinants of the number of antenatal visits in a metropolitan region.’ We want to thank the reviewers for their constructive, interesting suggestions and remarks. All suggestions and remarks are repeated grey. Our answer is written underneath in regular black text.

Reviewer’s report
Title: Determinants of the number of antenatal visits in a metropolitan region
Reviewer: Hyam Bashour
Reviewer’s report:
This is an interesting article which bringing a useful way of trying to understand the determinants of antenatal visits.
1: Major Compulsory Revisions
Additional clarifications of the nine clinical centres are necessary. What type of centres and on which basis they were selected.
There are 11 clinical centres in Brussels, geographically spread, that provide antenatal ultrasound screening. All centres were asked to participate in the study, but two decided not to. One was not interested and in the second centre there was already a study ongoing. They feared that another study would interfere too much with the daily practice. All women regardless of their regular health care provider (obstetrician, midwife, generalist) receive their ultrasound(s) during pregnancy in one of these centres. Recruiting women in these centres allowed us to include women irrespective of their care trajectory. With this choice differentiation in the care trajectories was not influenced.

The following sentence has been changed on p 4:
‘Women were recruited consecutively in nine of the eleven antenatal clinical centres that are spread over the region. During pregnancy each woman is referred to one of these centres for their ultrasound screening.’

Further it would be very useful to understand why diaries were used rather than embarking on other possible methods.
We did explore alternative ways to collect the data. Practical and methodological limitations made us decide to use the method of diaries. First, we looked at using medical files to document utilisation of care. Most practitioners have their own system of medical files. These are not integrated in an overall system and often these are not electronic files. This makes them less accessible for systematic data extraction. Also visits outside the regular practice will not be documented in that particular medical file. There is a potential for underreported utilization. Alternatively, we would have needed to visit each practitioner visited by the women. From management point-of-view this was not realistic. Because no data on the number of antenatal visits are routinely collected in Belgium, we could not base our data collection on national data. Another option could have been claims data from the National Institute for Health and Disability Insurance. But these
only register interventions that are reimbursed, they do not count visit. Further
they have to estimate the duration of the pregnancy, they do not have information
on when antenatal care started. Therefore we choose to register the visits
through a diary. Use of a diary to register antenatal care use has been found
effective[1]. Furthermore, events around pregnancy are considered as major life
events and therefore are usually well remembered.

We suggest to add this sentence in the method section on p 5:
‘Various alternatives of data collection were considered, like use of
medical files or data registers. These options were lacking the level of
detail required or were not reliable for our study. Use of a diary enabled us
to record every visit, even when the women change from care provider or
care setting.’

It would also be interesting to have the conceptual framework in graphic format
rather than detailed in text.
We shortened the explanation of the conceptual framework in the ‘background’
section (p3/4) and introduced a figure (see figure 1 on p 20) to visualize the
components of the framework. In doing so, we also reply on the comment of
reviewer 3 who suggested to visualize the structure of the variables to better
understand the data.

2: Minor Essential Revisions
Formatting problem and correction of references
We corrected the error in the reference of the BICE index under table 3 on the
last page.
The “authors’ checklist for manuscript formatting” was followed, the template was
used and URL’s of the weblinks are included in the reference list.

3: Discretionary Revisions
None

Reviewer's report
Title: Determinants of the number of antenatal visits in a metropilitan region
Reviewer: Franz Majoko
Reviewer's report:
No major revisions needed.
Minor essential revisions: None
Discretionary revisions:
Results.
Characteristics of the study sample (first paragraph)
Repetition between table 1 and text could be reduced.
We shortened this paragraph by leaving out some parts on p7 and p8.
Determinants of number of antenatal visits (first paragraph. Second sentence could be made clearer; the characteristics listed include those associated with increased and as well as decreased number of visits

We agree with this comment and deleted the word ‘increased’ and changed the sentence as follows:

‘The following characteristics were independently associated with the number of antenatal visits received:...’

Title: Determinants of the number of antenatal visits in a metropolitan region
Reviewer: Jari Haukka
Reviewer’s report:
Major Compulsory Revisions
Authors used "hot deck" method to impute for the missing data. Multiple imputation methods are more commonly used and theoretically better method. I propose multiple imputation to be used.

To respond to this comment, we applied the Multiple Imputation technique for the missing data in SAS (Proc MI). The Standard MCMC (Markov Chain Monte Carlo) procedure was used[2,3]. The default of 5 imputations was used. This number is sufficient when the missingness does not exceed 20%[2]. In our sample we had 9.3% missings. The same predicting variables, as for the Hotdeck method, were selected for the imputation. After imputation the Poisson regression model was rerun (Proc Genmod). In a last step the final model was created based on the models of each imputation (Proc Mianalyze) and account for variability between imputations and variability within the analyses.

The MI method was specified in the ‘variables’ section on p 6.
‘Multiple imputation methodology was applied to estimate missing data. Imputation was performed multiple times to create 5 complete data sets. In conducting our analyses, we used the Poisson regression techniques in the 5 imputed data sets. We then combined the results via the MIANALYZE procedure in SAS version 9.1 (SAS Institute, Cary, NC) to obtain the overall parameter estimates.’

After imputation, only small changes in estimates were found in the final Poisson regression model. We corrected the values of the numbers in table 3, in the abstract, the results and discussion sections accordingly.

Authors describe well three groups of explanatory variables: predisposing, enabling, and pregnancy related. However, the structure of these variables was not taken into account in modeling. It would be very useful to show directed acyclic graph (DAG) of variables. It could be possible that DAG could reveal
some interesting structures of explanatory variables. It would also help reader to understand the data better.

The structure of the model with the three groups of variables was taken into account in the modelling. We tried to make this clearer in the description of our analyses on p 6/7. Furthermore, the conceptual framework is described in a graphic format (figure 1) in reply to the comments of reviewer 1. We believe this is also an answer to this question of visualizing the structure of the explanatory variables.

In order to structure the explanatory variables, the framework of Andersen and Newman was used. The individual determinants described in this model contain the predisposing variables which are considered stable. Despite the characteristics of a person, some means must be available to be able to use health care services. These factors are defined as enabling determinants. Besides predisposing and enabling conditions the person must identify the need for care in pregnancy. This ‘need’ will represent an immediate cause to use health care and is defined as the third group of determinants. The reasoning of the three groups of determinants behind the model was used in the modelling. A backwards model was chosen.

On p 6-7 we changed the sentences on the modelling as follows:
‘As this was an exploratory study, we aimed to include all variables and choose for a backwards model as the best option. Corresponding to the health behavior model of Andersen and Newman[4,5], all predisposing variables were considered first. Variables that were not significant at p<0.05 were subsequently omitted from the model, starting with the variable with the highest p-value. This cycle was repeated until all variables were significant at the p <0.05 level. In the next round, the enabling factors were considered, with the selected predisposing variables fixed in the model. Again the least significant variable was left out and the model rerun to select a set of significant variables. In the third round, the pregnancy-related factors were studied, controlling for the variables in the first two rounds.’

In table 3 it was a bit unclear how adjusted visits were calculated. Please clarify details.

The adjusted visits were calculated based on the Poisson regression model. The logarithm of the predicted number of visits is based on a linear function of the predictor variable estimates. The exponent of the result was used as adjusted number of visits. The reported adjusted visit numbers are averages of the adjusted visits calculated from the multiple datasets.

There were 9 clinical centrals. Was there any differences between centers. Did authors consider taking clinical center into account in modeling as random effect?
The clinical centres were used for recruitment only. The centres have no effect on the actual number of visits in the woman’s trajectory. Women are referred to these settings by their regular practitioner for their ultrasound(s) only. In an exploratory phase, we controlled if the place of recruitment (clinical centre) was associated with the number of visits and no significant relation was found. Therefore we decided not to use a mixed model.

Minor Essential Revisions
Discretionary Revisions
Tables 1 and 2 could be merged to give better insight of data.
We merged tables 1 and 2. (p 22)

Although the journal does not impose a word limit, we were asked to shorten our manuscript.
We reduced the number of words from 3995 words to 3733 words.

Reference List


