Author's response to reviews

Title: Falls in advanced old age: recalled falls and prospective follow-up of over-90-year-olds in the Cambridge City over-75s Cohort study

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Version: 3 Date: 17 January 2008

Author's response to reviews: see over
16 January 2008

Dear Dr da-Silva

Falls in advanced old age: recalled falls and prospective follow-up of over-90-year-olds in the CC75C study

Thank you for your e-mail of 8 January with further feedback from the referees. We welcome their helpful comments and corrections and hope that the revised version we are uploading adequately addresses them all (See Falls in advanced old age - revisions after 2nd review 080116.doc and also Falls in advanced old age - revisions after 2nd review 080116_changes tracked.doc). Referee 1 made no further requests for changes and we have made all the minor revisions suggested by Referees 2 and 3. We hope that the way we have re-written the statistical methods – with the sub-headings suggested – will help to clarify the major concern from Referee 2 that we had not explained clearly which result arose from which regression analyses.

We have also amended the column labelling and relevant text in the results section, hence our uploading new copies of both Tables 1 and 2. There are no changes to any of the figures so no new uploads of these.

Finally, we refer you and the referees to the notes we have added to Clare Robertson’s report in response to her comments on our re-analysis addressing David Ganz’s query about clustering of falls. This additional information is perhaps too detailed to include in the paper itself, but we are pleased that your open access policy will allow others to view this if they wish.

We look forward to hearing the editorial decision in due course.

Yours sincerely

Jane Fleming (Corresponding author), Fiona Matthews and Carol Brayne on behalf of the CC75C collaboration
Reviewer's report

**Title:** Falls in advanced old age: recalled falls and prospective follow-up of over-90-year-olds in the Cambridge City over-75s Cohort study

**Version:** 2  **Date:** 27 November 2007

**Reviewer:** David Ganz

**Reviewer's report:**

General

Thanks to the authors for their excellent job in responding to my concerns. I have no additional concerns to raise.

**What next?**: Accept without revision

**Level of interest:** An article whose findings are important to those with closely related research interests

**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.
Reviewer's report

Title: Falls in advanced old age: recalled falls and prospective follow-up of over-90-year-olds in the Cambridge City over-75s Cohort study

Version: 2 Date: 19 December 2007

Reviewer: M. Clare Robertson

Reviewer's report:

Thank you for the opportunity to review this revised paper. The authors have addressed my comments and those of the other reviewers very carefully and thoroughly. The paper is much improved as a result and reads well with some interesting new information provided about the sample.

Major Compulsory Revisions

The author must respond to these before a decision on publication can be reached. For example, additional necessary experiments or controls, statistical mistakes, errors in interpretation.

I strongly support the use of negative binomial regression models for modelling the number of falls in the follow up year, and the number of falls reported in the previous year for that matter (separate models). Negative binomial regression models are commonly used in the falls literature and the authors do provide a published justification for their use in this field (reference 11). These models do adjust for overdispersion and my understanding is therefore that they account at least to some extent for the clustering of falls within individuals. Figure 2 illustrates nicely that the distribution of falls in the follow up year appears to meet a negative binomial distribution.

I have only one concern. Please can the description of the statistical methods used be explained a little more clearly still? It is not quite clear when negative binomial regression or logistic regression has been used especially when the results of multivariable models are reported. Perhaps subheadings in the Statistical Methods section would help (eg â##Prevalenceâ## of falling; â##Incidenceâ## of falls; Multivariable models).

Statistical methods re-written in sections (see pages 7 – 8).

I am familiar with the cluster(varname) statement being used in Stata when adjusting negative binomial regression models for clustering in cluster randomised controlled trials, but I am unclear about its use in the models the authors report. Perhaps the authors could state the independent and dependent variables used in the models and the variable used in the cluster statement, if indeed the cluster statement is necessary. The reason I am puzzled is that, if there is one record (row of data) per individual as I would expect, clustering on the individual would have no effect on the size of the confidence intervals of the relative rate estimates (incidence rate ratios) produced by the models.
You ask for more information about the use of the cluster syntax in our re-analysis. As you correctly expected there is one record per individual so for both the separate (retrospective and prospective) modelling

- the `nbreg` `varname` took the variables for each individual’s number of falls, recalled in the past year and recorded during follow-up respectively,

- the `exposure(varname)` took the number of person years in recalled and follow-up datasets respectively, and

- the `cluster` term took the variable for individual project numbers as the clustering variable

For example:

```
    nbreg nfallspastyear age sex res educ socclass, exposure(pryrfallhxpy) irr nolog cluster(projectnumber)
    nbreg nfallsflwup age sex res educ socclass, exposure(fllwuppy) irr nolog cluster(projectnumber)
```

Thus every participant's own falls are treated as not necessarily independent of each other by using unique coding for everyone (each individual's project number). This is assuming there may be even less lack of independence between all falls by one individual than just dependence of closely temporally clustered falls on each other. If, for example, an individual suffered seven falls over the full year of which three occurred on two successive days, for instance just before a hospital admission, it might reasonably be argued that only those three acute phase falls should be viewed as a cluster of falls. However, this re-analysis undertaken to address Dr Ganz's concerns about clustering treats all seven falls as a single cluster. In practice including or excluding the additional clustering information made little difference to the confidence intervals, however we have chosen to keep the analysis as Dr Ganz requested as it is the slightly more conservative approach.

Exploring the reasons for the small changes in the confidence intervals seen in the re-analysis, we have realised that the `cluster()` syntax causes Stata to use 'robust' (sandwich / Huber / White) estimation of variance. Explicitly specifying the robust variance estimator but without clustering produced identical output to that seen with the `cluster()` option. Our understanding is that the negative binomial analysis accounts for the overdispersion caused by clustering of falls within individuals, and the robust variance estimator allows for any possible deviation from the negative binomial model.
Also, as the results from a negative binomial regression model are expressed as incidence rate ratios, this term should be used where these models are reported in the Results section and in Tables 1 and 2. The abbreviation RR should perhaps be avoided for these models, as it may be interpreted incorrectly as a relative risk ratio (rather than a relative rate ratio).

**Tables, text and abstract changed as suggested.**

- **Minor Essential Revisions**

The author can be trusted to make these. For example, missing labels on figures, the wrong use of a term, spelling mistakes.

1. Measurements / Falls during follow-up section: I suggest using “If the participants were resident in a care home, they...” to avoid the use of both singular “was” and plural “they” in this sentence.

**Changed as suggested (page 6 paragraph 2).**

2. Results section, bottom of page 9: I suggest “how long after baseline before any fall event occurred.” or similar rather than using “fall arose.”

**Changed as suggested (now page 10 paragraph 2).**

- **Discretionary Revisions**

These are recommendations for improvement which the author can choose to ignore. For example clarifications, data that would be useful but not essential.

**What next?:** Accept after minor essential revisions

**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.
Reviewer's report

Title: Falls in advanced old age: recalled falls and prospective follow-up of over-90-year-olds in the Cambridge City over-75s Cohort study

Version: 2 Date: 18 December 2007

Reviewer: Keith Hill

Reviewer's report:

The authors have adequately addressed the issues raised in my initial review. The revised paper reads well.

Major compulsory revisions – none

Minor essential revisions:
1. Page 7, statistical methods section, line 6 change from relative risks was ... to relative risks were ...

Statistical methods section has been re-written (now pages 7 – 8).

2. Page 8, lines 3-7 long confusing sentence break into two sentences.

Changed in re-writing statistical methods section (pages 7 – 8).

3. Page 12, paragraph 3, line 8 - ?? should these figures be falls / p-year (as has been converted elsewhere in the paper)?

Yes, thanks for spotting this, corrected (now page 13 paragraph 1).

4. Page 19, para 3, line 5 typo between study and found so that text reads study which found

Thanks - corrected (now page 20 paragraph 2).

Discretionary revisions – none

What next?: Accept after minor essential revisions

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