Author's response to reviews

Title: Identifying patients at risk of nursing home admission: The Leeds Elderly Assessment Dependency Screening tool (LEADS)

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Author's response to reviews:

Dear Sir/Madam,

Thank you for your response to our paper, and the comments given by the reviewers. We have substantially revised the paper in the light of these comments, and list in detail the response to each comment raised. We hope these amendments fulfil the reviewers comments and look forward to hearing from you in due course.

Yours truly,
Anita Slade

Reviewer: Yea-ing Shyu

I. We realised that we probably misled the reader by indicating that this was a single assessment scale, consistent with the SAP which arose from the NSF. There are indeed several scales which have been developed for this purpose, but we realised that what we were proposing was quite different; namely a screening tool for use in an acute elderly setting, to predict the need for nursing home care. Consequently we have changed our text throughout to make this clear, and avoid any further confusion.

II. Again, we have probably caused confusion by our reference to a methodology to deal with rare events in a logistic regression model, which referred to cases and controls. There is no such division in our data set, and we have modified the text to make this clear.

III. We have added a reference to support the choice of the Rasch model for this type of analysis.

IV (a). We have added text which clearly indicated from where, and how the 17 item scale was derived.

IV (b) We have added the results of the best model from the five samples which shows only the LEADS scale, without other variables, for comparison. Table 3

V. We have specified the population within which additional tests of validity should be carried out.

Reviewer: Michael Hofler

Major revisions.
1. We have added a sentence into the discussion to emphasise the likely over estimation of the predictive value.
2. We chose the Likelihood ratio method because it has been claimed to be better for clinical studies. However, we have now added a ROC analysis for comparison purposes.
3. Again, as with reviewer one, we have misled the reviewer on the issue of cases and controls. There were no controls, only those who entered a nursing home and those who did not. The five samples we selected from those not entering a nursing home, to create the five logistic regression analyses, were chosen at random, and this is stated explicitly in the text. We have expanded on this to make the process clearer.
4. There are two issues here - the Rasch analysis and the logistic regressions. In the former, Rasch measurement is independent of distribution (because parameter estimates of item difficulties and person abilities are linear in the argument of the exponential expression so that they can be sufficiently estimated and conditioned out of the estimation of other parameters). Thus there is no need to weight the analysis to be representative of any particular population distribution. The argument for weighting the logistic regression (and this would be weighted as a weight to one) would be to make the model parameters consistent with the total population from which the sample was drawn. This is an interesting point, as we
used several samples to ascertain the best model. However, we are not in any way claiming that our own group of patients is representative of the elderly population presenting at an acute hospital. The samples we drew were explicitly for methodological reasons to make the balance of the dependent variable more appropriate for a logistic regression analysis. Thus we do not feel that weighting the samples are appropriate (and we are surprised to see that SPSS does not, in any case, handle weights properly!).

5. We have added some extra text to state how the information was collected.

6. We excluded those who died from our analysis, and have made this explicit in the text. We have given the results of the re-tests in Table 5.

Minor essential revisions.

1. We have added the specificity results to the abstract.

2. We have deleted the first sentence of the statistical methods section.

3. We have mentioned the scales used to develop the LEADS.

4. We have explained the positive likelihood ratio as part of the notes to Table 5.

5. We have included the means and SD in Table 2. All statistical tests have this potential interpretation, and given sample size, significance may be found with little substantive meaning. We do not think this is an appropriate place to raise these issues.

6. We find this difficult to digest in that medical outcome studies are predicated upon the 95% CI, and virtually all interpretation is based on this rigid range. We cannot see how we might diverge from this.

7. We have checked all tables, and all are now present.

8. As above.

9. We have changed the text to make the division between nursing home and 'others' clearer to the reader.

Discretionary revisions:

1. We have changed the text accordingly.