Reviewer's report

Title: Estimating global mortality from potentially foodborne diseases - an analysis using vital registration data

Version: 4 Date: 27 August 2011

Reviewer: Marie Ng

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The authors have elaborated a little more on the results of the predictive validity analysis. However, the comparisons and interpretations of the results still could be presented more systematically. In explaining the results of predictive validity check, the authors wrote “The differences in RMSE values between the proposed and competing models were largest between the models lacking one predictor compared to models that were derived by excluding data.” It is not clear why such comparison is relevant. The difference in RMSE (of source models) between the final model and model without a predictor reveals the difference in in-sample validity of two distinct models. The difference in RSME (of source models) between the final model and a model without sample data reveals the difference in in-sample validity of the two models based on different samples. Such comparison does not seem to address how well the model predict out-of-sample. Given that part of this study involved predicting FBD mortality in countries outside the original data, verifying the model's ability to predict out-of-sample is crucial.

A more systematic approach would be to compare and highlight the differences between:

1. Proposed model (all data) vs. model without 1 predictor (all data)
2. Proposed model (without the Netherlands) vs. model without 1 predictor (without the Netherlands)
3. Proposed model (without the USA) vs. model without 1 predictor (without the USA)

Comparison 1 reflects how well the models fit the data (in-sample estimation). Comparison 2 and 3 reveal how well the models predict (out-of-sample prediction).

When assessing the out-of-sample validity (i.e. comparisons 2 and 3), prediction errors should be the key not the RMSE of source models (as the authors have noted, the more predictors there are in a model, the lower the RMSE. RMSE of source model is not particularly indicative). In the results shown in Table A3 for example, in the proposed model (without the USA), the predicted mortality for the USA is 1.03, and in the model without 1 predictor (without the USA), the predicted mortality for the USA is 1.09. The proposed model yields a value which is closer to the observed 0.65 (assuming the observed is the gold standard). In
other words, when predicting a data point out of the original set, the proposed model yields a smaller prediction error. Hence, one can argue that it is a better model for prediction. It would perhaps be clearer if the authors have elaborated their results this way.

Ideally, if the authors use a cross-validation approach in which not just one but a number of countries are held out systematically, they could have calculated RMSE for out-of-sample predictions. That would be more vigorous. What they have done is still informative, but the presentation and exactly what they are comparing needs to be more carefully laid out.

Finally, the authors mentioned in the cover letter that they would prefer not using the terms “in-sample” and “out-of-sample” to avoid confusing readers. These terms are commonly used in statistics and have been used in articles published in PHM. The audience of PHM should not have much problem understanding them.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.