Reviewer's report

Title: Bayes Rules for Optimally using Hierarchical Regression Models to Identify High-Mortality Hospitals

Version: 1 Date: 20 February 2008

Reviewer: Michael Racz

Reviewer's report:

Major Compulsory Revisions

1) In the case study, the author flags high mortality hospitals under 9 different criteria; Three loss functions each with 3 different tolerances for the type of errors acceptable. I think the paper could be improved if there is a comparison with some of the methods endorsed in the literature or used by states that publish report cards. For example, the author refers to the Normand et al. method and a follow-up analysis by Austin and Brunner which demonstrated that the use of posterior tail probabilities was the Bayes Rule associated with generalized 1-0 loss. In the case study there are hospital A-E which are high mortality outliers under different loss function specifications. If the Normand method was applied, how many of A-E would be outliers? Consider a method from a state which does not apply a shrinkage methodology. How many of hospitals A-E would be high mortality outliers under this methodology?

2) On page 17, the case study MVN proper prior mean vector, (-2.06, 0.91), is very specific. How sensitive are the results to these numbers? It might be worth repeating here how these numbers were chosen.

Minor Essential Revisions

3) In the first paragraph of the Background, the author puts Massachusetts in the category of publishing hospital-specific mortality rates. They recently released surgeon-specific as well.

4) In the second paragraph of the background, the author discusses two main goals of provider profiling and makes reference to a paper by McGlynn. It might be helpful to give the reader some additional references which give summary overviews of profiling issues. An example is: Normand, S-L T, Shahian, DM (2007) Statistical and Clinical Aspects of Hospital Outcomes Profiling Statistical Sciences 22 206-226.

5) In the 3rd line of the first full paragraph on page 5, pediatric is misspelled.

6) The term “random effects” is in the title of Figure 2. The text states these are random intercepts. Also, it should be indicated on the figures that the solid vertical line depicts a threshold for high mortality.

Discretionary Revisions
7) There are several derivations in this paper. One suggestion is that first one or two be part of the text and the others in an appendix.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I have non-financial competing interests in that I am an analyst for the New York State Department of Health report cards which assess providers of coronary artery bypass graft surgery and percutaneous coronary interventions.