Reviewer's report

Title: The most dangerous hospital or the most dangerous equation?

Version: 1 Date: 2 July 2007

Reviewer: Robert Gibberd

Reviewer's report:

General

This paper discusses the problem of reporting hospital mortality rates when not taking into account random variation. The main point in the paper is to emphasise that the random variation of rates is proportional to the inverse of the square root of the sample size. This is fairly well known to the journal readers, and as such does not provide any new insights. In particular, there are papers that attempt to show how reporting can be improved (eg Gibberd reports on the UK mortality data and how it could be reported), by either using 95% confidence intervals, or Bayesian shrinkage estimates.

The paper also gives examples that are misleading: page 4 assumes that with expected number of deaths, assume that the variation is 10 +/- 2. However, the standard deviation for a Poisson process with mean 10 is square root of 10, or over 3. Thus, 95% of observations would be 10 +/- 6.

Table 1 gives the better and poorer hospitals and the number of beds, but the average number of the remaining hospitals should be reported, in order to see that the smaller units have the extreme values. Plotting all the data instead of the simulation as in Figure 1 would be more relevant.


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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

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Discretionary Revisions (which the author can choose to ignore)
What next?: Reject because too small an advance to publish

Level of interest: An article of limited interest

Quality of written English: Acceptable

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

Declaration of competing interests:
'I declare that I have no competing interests'