**Reviewer’s report**

**Title:** A comparison between the APACHE II and Charlson Index Score for predicting hospital mortality in critically ill patients: a population based cohort study

**Version:** 1  **Date:** 12 January 2009

**Reviewer:** Bodin Khwannimit

**Reviewer’s report:**

The authors are reporting a population-based cohort study in critically ill patients in multi-system ICU in Canada. The ability of Charlson index alone to discriminate between hospital survivors and non-survivors was poor. Adding or replacing the APACHE II weighted comorbidity with the Charlson index did not significantly improve the discrimination.

**Comments**

**Major Compulsory Revisions**

1. If there was multiple ICU admission occurred in the same hospitalization. How about to collected the APACHE II score.
2. If the patients was multiple hospital admissions during study, Was the data collected by counting the number of individuals or by the hospital admissions? and if there was any multiple hospital admission occurred, the outcome of which hospital admission was used to determine the final outcome?
3. It would be more comprehensible if the ROC and AUC were showed in manuscript, and compare ROC and AUC between the model
4. Any data available about the chi-square of the Hosmer-Lemeshow goodness-of-fit test of any model?
5. Discussion. Are data available to compare with the previous study by Ho KM. et al. (Combining multiple comorbidities with Acute Physiology Score to predict hospital mortality of critically ill patients: a linked data cohort study. Anaesthesia 2007;62:1095-1100.)
6. Why the authors suggest to used the Charlson index as an alternative method of risk adjustment and comparison between ICU. In this study the Charlson had poor discrimination with c index = 0.626. In my opinion and the previous study about severity score, there are several factors affect the performance of the scores for predicting mortality in a new population and/or different case-mix or the comparison the performance between ICUs.

**Minor Essential Revisions**

Please revised about the typographical mistakes

1. In abstract and results the number of APACHE II C=0.813 but the authors use 0.8135
2. The results paragraph 1 line 5 -> 18.9%
3. Comorbidities vs. co-morbidities, almost the authors used comorbidities however, in the results page 8 paragraph 2 line 4, the authors used co-morbidities
4. The results page 8 paragraph 2 line 10 -> (mild and moderate or severe))
5. Almost the authors used Charlson index but in the discussion page 10 paragraph 2 line 14 and in key messages the authors used Charlson Index
6. Table 1. admitting Apache II should correct to APAHCE II and mean 19.6 +/- 8.6 not 19.61 +/- 8.63
7. Please revise the heading of Table 1-3 about the different in typing of the capital letter

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

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I declare that I have no competing interests.