Reviewer’s report

Title: A Three-Step Approach for the Derivation and Validation of High-Performing Predictive Models Using an Operational Dataset: Congestive Heart Failure Readmission Case Study

Version: 3
Date: 19 February 2014
Reviewer: Steven Babin

Reviewer’s report:

General Comments: This paper presents a three-step approach for developing models predicting readmissions following hospitalization for CHF. The paper is organized logically and is relatively easy to read. The question posed by the authors is well-defined and the methods are appropriate. The limitations of the work are clearly stated. The topic of readmissions is important both from cost-saving and life-saving perspectives.

Major Compulsory Revisions:
1. Please define “first reading weight”, “last reading weight”, “last heart rate”, etc. I think I know what you mean but they should be precisely defined to avoid any misinterpretation or ambiguity. E.g., is first reading weight the weight upon hospital admission?

2. Model accuracy can be defined in several different ways. In fact, AUC, sensitivity, specificity, etc. are all considered measures of model accuracy, but this paper lists accuracy as though it is an entirely separate quantity. That is okay as long as you specifically state what is meant and how model accuracy is calculated in this paper.

3. For the Emergency Department Frequency plot in Figure 5, please explain the abscissa. Is this the number of visits per person per year? Or is this the number of ED visits per person for the previous 6 months? Or is it something else?

Minor Essential Revisions:
1. The URL listings in the references won’t work because there are no full stops (.) within them. E.g., reference 44 is written was www.census.gov instead of www.census.gov

2. The word insurance in misspelled in Figure 1 and perhaps elsewhere. It should be insurance instead of insurrance.

Discretionary Revisions:
1. Figures 1 and 2 are difficult to interpret. These might be better as tables.

Level of interest: An article of importance in its field
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.