Reviewer’s report

Title: Forecasting daily attendances at an emergency department using time series analysis

Version: 1 Date: 22 July 2008

Reviewer: Jennifer Peel

Reviewer’s report:

General Comments
This manuscript covers a potentially interesting topic. However, more detail is needed in the manuscript in order for the reader to be able to understand the methods. Additionally, there needs to be some discussion about what the results mean and how they could be used.

Major Compulsory Revisions
1. Background: If this manuscript is dealing with daily ED attendances, then how could the results be useful of long term financial and strategic planning?
2. Background: Explain how these results could be useful for regional health care planning.
3. Methods: Provide more information about the P1-P4 levels (e.g., how were they defined and was the definition created a priori?).
4. Methods: Define month of year: Is this calendar month or month of the study? If calendar month, then the interpretation in the Results section (Univariate analysis) is incorrect.
5. Methods: How were the potential predictor variables chosen? Were there other factors considered or alternative metrics of the variables used (e.g., max or min temperature)? What have the previous forecasting papers shown to be important?
6. Methods: How were the variables entered into the models? For example, as linear terms? Were they same day as the ED visits or lagged (e.g., air pollution from a previous day is often related to today’s ED visits)?
7. Methods: Explain why the models were used (ARIMA and exponential smoothing).
8. Methods: Define the “test” period and the “validate” period – what do these terms mean?
9. Methods: Why was the PSI used rather than individual pollution levels? What lag was used for air pollution? Why were the categories of PSI used rather than a continuous PSI?
10. The important predictors could vary by season – was this assessed?
11. Results – Univariate analysis: which model are these results from?
12. Results – Univariate analysis: see #4 above

13. Results – Predictors and prediction evaluation: What is the “simple seasonal model”?

14. Discussion: How is “good accuracy” defined?

15. Discussion: How would these results be used in the health care setting or for regional health care planning? Do the ED attendance levels vary sufficiently to warrant a change in staffing levels (considering the margin of error of these prediction levels)? Would daily changes in staffing levels be feasible or cost-effective?

16. Discussion: What are the strengths and limitations of the study?

17. Figure 4: make the figures larger.

18. Table 2: See #4 above for interpretation of the “month” variable. Provide all p-values (do not put “ns”). What is the reference for the month variable?

19. Table 2: What is the purpose of this table? If the objective of the study is the forecasting model, then why is this important? If the study was not designed to evaluate the relationship of these variables and the daily ED attendances, then this table is not believable and does not contribute anything to the paper.

20. Table 3: Explain the model notation.

Minor Essential Revisions

21. Define each abbreviation in a table (e.g., P1, P2, P3).

Discretionary Revisions

22. The title is generic – consider revising.

**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.