Reviewer’s report

Title: Crowding in the emergency department in the absence of boarding – A transition regression model to predict departures and waiting time

Version: 0 Date: 07 Jan 2019
Reviewer: Seow Yian Tay

Reviewer's report:

For clarification:

1. Line 81 - the number for 2013 (N= 17520) is different from the estimated annual attendance (40000) in line 66. Over a year, conceivably $\sum A(t)$ should = $\sum D(t)$ = N ≈ annual attendance.

Suggestions:

1. Additional File 1: It might be helpful to include on-duty physician shifts as physician numbers should also affect departure time.

2. Line 128 - the definition of "waiting time" seems to be very close to turnaround time or length-of-stay, which may be better understood by emergency department readers. https://www.qualityindicators.ahrq.gov/Downloads/Resources/Publications/2006/EDPerformanceMeasures-ConsensusStatement.pdf

General:

1. Lines 177 and 253-261 - "number of new arrivals" is not an "actionable" predictor unless you can turn away new arrivals or divert ambulance arrivals, both of which are undesirable actions. Likewise length of queue in itself is not particularly helpful to inform mitigation measures. Length of queue is predicated on ability of staff to turn over patients in the ED, which in a labor-intensive environment like the ED, essentially depends on staffing numbers. Would the authors consider modelling changes to staffing numbers at different times of the day to see how this would impact waiting time?

2. the use of binomial regression to model ED length of stay is novel to me, I have not come across this in the EM literature as yet. The authors made no arguments as to whether it is a valid model to apply to ED arrivals and departures.
Typos:
Line 68,
Line 105
Line 239?
Line 258

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Unable to assess

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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