Author's response to reviews

Title: Automated, sustainable, broad-based, near real-time public health surveillance using presentations to hospital Emergency Departments in New South Wales, Australia

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The Editor
BMC Public Health

Dear Editor

Re: Automated, sustainable, broad-based, near real-time public health surveillance using presentations to hospital Emergency Departments in New South Wales, Australia

I am writing to provide a revised manuscript in response to reviewer comments. We are grateful to the reviewers for providing thorough and valuable feedback.

In response to the compulsory revisions, we have made the following changes:

Background

Has been substantially revised and reorganised to state more clearly the aims of the surveillance system, the aims of the manuscript, and how these aims are related to the demand for early warning systems in public health.

Available information on overseas visitors and the population impact of the Rugby World Cup is now presented to allow the reader to assess the scale of the Rugby World Cup's impact on the population.

Methods

The proportion of ED visits seen at the twelve EDs has been added.

Breakdown of HL7 and batch methods has been more explicitly described and clearer reasoning for choice of methods is stated.

Answers to reviewer questions regarding the training of the category classifier have been included in the text. However, questions regarding the benefits or challenges resulting from allowing multiple syndrome categories for each ED visit will need to be answered in future reports after completion of more formal system evaluation. At this stage, any discussion of these would have to be based on subjective opinion and would therefore be premature. As requested, the explanation of the choice of probability threshold in the classifier has been revised and expanded.

Description of the automated daily reports has been revised to answer the reviewer's questions and increase clarity.
The description of the use of loess regression was removed because, as the reviewer points out, readers may not be familiar with the technique. Its inclusion would not add substantial value to the manuscript.

The description of the cusum and its standardisation has been expanded and clarified to make it less 'convoluted'. Justification for the use of a single day as the expected value is now provided and choice and justification of signalling threshold is provided. The limitations of the cusum are reviewed in the Discussion, and the discussion of limitations has been expanded to cover the reviewer's concerns.

The description of the public health response now includes more detail to assist the reader in assessing our response to the data we reported.

Results

We have responded to the second reviewers' comments by incorporating a much greater level of detail to assist the reader in making a more objective evaluation of the system's performance during the Rugby tournament.

The present manuscript is intended only to show early results. More detailed and formal evaluations are in progress, but we think it is important to publish our methods so that they can be considered by the public health community.

Greater detail has been added to describe the justification for our results on missed outbreaks and identified outbreaks. The number of signals produced by the cusum has been reported and reviewed.

The number of syndrome categories has been corrected in both the abstract and the main text. They are referred to in Table 1, as before. In relation to infectious agents, all syndrome categories are listed in Table 1.

Specific comments about the number of syndromes have been addressed by clarifying the numbers and titles and column headings of Table 1. Footnotes have been added to clarify this table. Table 1 fulfils several functions for the paper, which may have caused confusion. We have hopefully made its role more explicit now.

The influx of overseas visitors relating to the Cup has been addressed in the introduction, with presentation of statistics available from the Australian Bureau of Statistics.

Discussion of the relative merits of the syndrome categories in relation to infectious diseases is left for the discussion, which now provides a more balanced review of the results.

The sentence regarding "reassurance to public health personnel" has been deleted.

Results outside the Rugby World Cup period have been deleted, as the reviewer rightly points out these are not strictly relevant. We did not only aim to describe results from that period, but in hindsight this could cause confusion.

Discussion

As suggested by reviewer 1, we have briefly discussed our decision not to analyse geographically based on patient address of residence.

Reviewer 2's comments:

Implementation time is now discussed - and can be drawn from the date funding was announced given in the Introduction and the baseline and the date the Rugby World Cup started.

The value of frequent data feeds is now discussed - towards the beginning of the Discussion. This gives us the flexibility in the future to implement real-time analysis and reporting more frequently than once per day.

The reviewer's concerns about the relative value of reportable communicable diseases has been addressed by acknowledging the lack of specificity of syndrome trends, which remains a challenge in syndromic surveillance. Overall, the Discussion about the merits of this system is now more balanced. The Conclusion now expresses the complementary nature of the ED and traditional laboratory-based notifiable disease surveillance systems.
The relative value of diagnosis and text-based syndrome categories are now discussed with a more measured assessment of their relative benefits. Each method has merits, and the discussion is based partly on the results reported in the paper and partly our extensive experience working with non real-time ED data in the past. While we agree with the reviewer that it would be useful to provide quantification of the many aspects of ED data that we discuss, it is not within the scope of this manuscript to achieve that. More formal evaluations of syndrome classification accuracy are in progress and they will be subsequently reported.

In response to the quandary of syndromic surveillance systems mentioned by the reviewer, we have included extra discussion around this point and the fact that we believe surveillance staff need a strong understanding of the epidemiology of the syndromes they monitor and the need for assessing the apparent severity of trends seen through the system.

In relation to justification of cost and diversion of resources. We have reframed the manuscript somewhat in terms of showing only the early results of a trial of a new type of public health surveillance system in Australia. Hopefully the aims are now much clearer. We have removed discussion of cost. While we believe the system has proven valuable in its ongoing use, detailed reporting of the cost-benefit of the system will have to wait for subsequent papers - it is beyond the scope of this manuscript. We do believe that the novel methods we have used should be reported, even if the lack of public health problems that occurred during the Rugby tournament does not provide the opportunity to rigorously quantitate potential benefits.

I look forward to your response.

Yours sincerely

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