Author's response to reviews

Title: Can near real-time monitoring of Emergency Department diagnoses facilitate early response to sporadic meningococcal infection? - prospective and retrospective evaluations

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Author's response to reviews: see over
Dear Sir/Madam

Can near real-time monitoring of Emergency Department diagnoses facilitate early response to sporadic meningococcal infection? - prospective and retrospective evaluations

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

Reviewer comments and editorial requests are shown in Blue. Our responses are shown in black following the reviewers' comments.

Reviewer: Jan Hendrik Richardus

Discretionary revision: The only question I have is why there is no time advantage of daily ED surveillance compared to conventional reporting? Is this because of the low PPV, or is there an independent factor involved? This may need some clarification.

The reason why there was no time advantage of ED surveillance data compared to conventional reporting is because of the results from the prospective evaluation. The evaluation showed that with once daily review of new diagnoses of meningococcal infection received in the ED surveillance database in the previous 24 hours, was not timelier than a treating clinician notifying the public health unit by telephone when the diagnosis was made. During the 9-month study period, of 31 patients presenting to the 15 EDs that were subsequently assigned a provisional diagnosis of meningococcal disease, 12 were true cases of meningococcal disease. All 12 cases were notified to public health authorities prior to the ED surveillance staff notification, mostly by the treating clinicians from the hospital. Even if more frequent checking for new diagnoses was made from the ED surveillance database, the low sensitivity and PPV from the retrospective evaluation did not justify any revision of ED surveillance workflow. We have provided further clarification in the first paragraph of the Discussion section on page 15.

Reviewer: Pawel Stefanoff

The manuscript "Can near real-time monitoring of Emergency Department diagnoses facilitate early response to sporadic meningococcal infection? -prospective and retrospective evaluations" provides interesting insight into the possibility of using syndromic surveillance into earlier detection of public health threats, considering invasive meningococcal disease as an example. The results indicate that monitoring ED diagnoses is not improving timeliness of public health response, and its sensitivity
and positive predictive value is too low to be considered as an alternative to the routine notifications system. The methods used to demonstrate the performance of the alternative systems are sound, and justify the conclusions made. Overall, the article is well written, concise, and worth publishing as providing important evidence useful for public health practice.

I would suggest few minor (discretionary) corrections to improve clarity of the manuscript:

1. p. 4. I would rather not use the terms "isolated incidence", nor "dearth of literature", which can be difficult to understand for non-English readers.

"Isolated incidence” has been changed to “sporadic cases” and “dearth of literature” has been changed to “To our knowledge, there have not been any reported studies...” (please see the 1st paragraph on page 4).

2. p. 5. It would be useful to explain who implemented ED surveillance. Was it a national or regional institute of public health, bureau of statistics, or a university? It could be better explained how the system worked, for example which unit was collecting the ED reports, calling the regional PHUs?

The ED surveillance system was administered by the Centre for Epidemiology and Research of the New South Wales Department of Health, which is the state health authority. Additional information on how the system worked and the data collection for the prospective evaluations have been added to the 2nd paragraph on page 5 and the first and the second paragraph on page 7.

3. I suggest to move all the details of the system from the background to the methods section, to avoid duplication of the system description.

Descriptions on mandatory reporting of meningococcal disease have been moved to the second paragraph on page 10 under the methods section describing the NSW Notifiable Disease Database.

Some details of the NSW syndromic surveillance system have been moved to the 1st and 2nd paragraph on page 7 under the methods section describing study design and data collection for the prospective evaluation.

4. p. 10, first phrase of the retrospective evaluation: "in 2004" used twice in the same phrase.

One of “in 2004” has been removed.

**Reviewer: Raika Durusoy**

This is a study on a specific topic, and would be of considerable interest to scientists and practitioners working to improve surveillance systems.

1. Is the question posed by the authors well defined?
   - Yes, the question is well defined.
2. Are the methods appropriate and well described?

- Generally, yes. However, a clarification on the total number of emergency departments would aid in the concretisation of the coverage or representativeness of both the NSW syndromic surveillance system and the EDDC.

15 out of 32 EDs in the greater Sydney metropolitan area were participating in the syndromic surveillance system at the time when the study was undertaken. The 15 EDs represented about 52% of ED visits in the greater Sydney metropolitan area (please see the 1st paragraph on page 7).

There were 57 EDS that contributed data to the EDDC in 2004, and they represented 75% of total ED presentations in NSW (please see the 1st paragraph on page 10).

- Notifications are considered as gold standard but there might be true cases that are not notified. This issue is sufficiently addressed as a limitation of this study. A solution might be the acquisition of data like N.meningitidis culture positive cases from laboratories or other data from other source(s). This assessment might be done in another study.

3. Are the data sound?

- The results section is very clear. Its organization with its sub-headings is very practical and easier to understand than the Methods.

- Is there a possibility that the NDD has false positive notifications? Are they all true cases?

Only cases that meet either probable or confirmed case definitions are recorded in NDD and all probable cases are removed from the NDD within one working day after an alternative diagnosis is made. Therefore, it is possible but unlikely that NDD has false positive cases. However, we are unable to comment on the testing methods used by laboratories, which have certain levels of sensitivity and specificity for detecting meningococcal infection.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

- Yes, the manuscript adheres to the general standards of reporting scientific research and the instructions of the journal.

5. Are the discussion and conclusions well balanced and adequately supported by the data?

- Yes, the findings are discussed - including an honest description of the limitations - and they are adequately supported by the data. Some more references might enrich the discussion, see under 7.

6. Are limitations of the work clearly stated?

- Yes, the major limitations of the study are clearly and honestly stated.
7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?

- Yes. The discussion could include further comparisons with other studies, like the ones below that I found with a quick PubMed search:


to discuss other efforts on capturing meningitis data from EDs or to discuss the different findings among different diseases with syndromic surveillance studies like:


Please our response to the third point under major compulsory revision.

8. Do the title and abstract accurately convey what has been found?
- Yes, the title reflects the main questions (both sensitivity and timeliness) and methods of the study. The abstract comprehensively summarizes the study.

9. Is the writing acceptable?
- Yes, the writing is very good.

Discretionary Revisions
It is the first time that I encounter the usage “Neisseria meningitides”. When I searched in Google, I got 19,200 results but with the “Neisseria meningitidis” I got 374,000 results. It is strange to see two different usages of a scientific Latin name of a species. The –es suffix in Latin is to make the word ending with –is plural, so that might be wrong.

This was a typographic error and has been corrected (1st paragraph on page 4).

Minor Essential Revisions

- Major Compulsory Revisions
  1. Under the heading ‘The NSW syndromic surveillance system’ in the Methods section, the first sentence states that ‘In 2005, there were 15 EDs in the Sydney metropolitan area participating in the ED surveillance system.’ The total number of EDs in Sydney and in NSW in total would make the Methods section more precise.

At the time when the study was undertaken, there were 15 EDs in the Sydney metropolitan area participating in the ED surveillance system, representing 52% of total ED presentations in the greater Sydney metropolitan area.

There were 57 EDs that contributed data to the EDDC in 2004, and they represented 75% of total ED presentations in NSW.
The additional information on the representativeness of both the ED surveillance system and the EDDC has been added to the 1st paragraph on page 7 and the 1st paragraph on page 10.

2. The description of the first ED surveillance system could be carried under the heading ‘prospective evaluation’ and the description of the second under ‘retrospective evaluation’. As someone who is not involved in Australia’s, and specifically NSW’s surveillance system, it would be easier to concentrate on the systems once and understand their procedures and evaluation altogether, than to learn about the system, read about ‘data collection and study design’ and then try to understand which one was evaluated in which manner. Because at a first pass/reading, it is hard to keep in mind the specific names and acronyms of the systems that we are totally unfamiliar with, so one feels the need to go back and read the description when reading the evaluation. So the ‘data collection and study design heading’ could be the first subheading of the methods section.

The method section has been re-organised so that description of the systems immediately precedes the description of study design and data collection for both prospective and retrospective evaluations. We have also revised to limit use of acronyms.

3. The inclusion of some more references would enrich the discussion.

Thanks for recommending extra references. We have included the papers by Gundlapalli et al (2007) and Townes et al (2004) in the discussion. We have also included a few other references that explored the usefulness of syndromic data streams for surveillance of various health problems. Please see the second paragraph of the Discussion section on page 16.

4. The methods would benefit from a clarification on why only approximately 9 months were included for the prospective evaluation. It would have been better to include data on a whole year, due to seasonal trends of infectious diseases. And also November and December 2004 are included in both the prospective and retrospective evaluations. This would also benefit from an explanation.

The prospective evaluation started in November 2004 when there was a need to evaluate the usefulness of ED surveillance data for meningococcal disease recognised at the both central and local levels. At the time, there was no end date chosen and the plan was to run the evaluation until the time when there was sufficient evidence to answer the research question. After 9 months, it became clear that there was no time advantage of additional reporting of meningococcal diagnoses by ED surveillance staff compared to traditional notifications by clinicians. Therefore, we made the decision to conclude the prospective evaluation in July 2005 in consultation with the Steering Committee of the ED surveillance system and senior management within the Department of Health.

The following paragraph was added to the methods section (the 2nd paragraph on page 9):
"After 9 months, the interim analysis reported here identified that there was no benefit to continuing the prospective evaluation and, following consultation with stakeholders, reporting ceased on 22 July 2005."

With respect to the retrospective evaluation, calendar year 2004 was chosen because, at the time of the study, it was the most recent year data were available in both the Emergency Department Data Collection and the NSW Notifiable Disease Database.

**Editorial requests**

We recommend that you ask a native English speaking colleague to help you copyedit the paper. If this is not possible, you may need to use a professional copyediting service. Examples are those provided by the Manuscript Presentation Service (www.biomedes.co.uk), International Science Editing (http://www.internationalscienceediting.com/) and English Manager Science Editing (http://www.sciencemanager.com/). BioMed Central has no first-hand experience of these companies and can take no responsibility for the quality of their service.

Yes, this has been done.

Experimental research that is reported in the manuscript must have been performed with the approval of an appropriate ethics committee. Research carried out on humans must be in compliance with the Helsinki Declaration (http://www.wma.net/e/policy/b3.htm), and any experimental research on animals must follow internationally recognized guidelines. A statement to this effect must appear in the Methods section of the manuscript, including the name of the body which gave approval, with a reference number where appropriate.

The following paragraph was added to the methods section (the last paragraph on page 13):

“This quality assurance study was conducted under the health services management provisions of the Health Records and Information Privacy Act 2002 (New South Wales, Australia) [http://www.lawlink.nsw.gov.au/lawlink/privacynsw/ll_pnsw.nsf/pages/pnsw_03_hripact] and ethical approval was not required.”

I hope these changes are satisfactory and look forward to your response.

Yours sincerely

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Centre for Epidemiology and Research
3 September 2010