Reviewer’s report

Title: Hospital-Acquired Influenza in an Australian Tertiary Centre 2017: A Surveillance Based Study

Version: 0 Date: 21 Nov 2018

Reviewer: Thomas Benet

Reviewer’s report:

Parkash et al. reported descriptive epidemiological findings from a surveillance of community-acquired (CA) and hospital-acquired influenza (HAI) during a seasonal outbreak in a large Australian tertiary hospital. I have the following major and minor comments. Inclusion of confirmed influenza cases only and detailed descriptive date of HAI are positive points. I have however some comment, particularly on the definition of CAI and on the multivariate analysis.

Major comments

- The inclusion of influenza cases with diagnosis <=6 days after onset in the CAH group might lead to misclassification bias of the disease (some of them can be HAI). I would recommend either to exclude cases with sample collection between 48h-6 days who have unknown date of onset, or to test if patients with sample collection in the 1-2d period differ from those with sample collection in the 3-6d period with unknown date of onset (and report in if they are different or not, in order to conclude if the definition is relevant or not).

- The results of the multivariate regression are not convincing. Basically, logistic regression aims to assess factors associated with HAI (potentially risk factors for HAI) compared with CAI. Here, complications are tested to explain the outcome (CAI vs. HAI). In addition, the 30 days outcome might be replace by a single variable (i.e. 0: hospitalized, 1: discharged, 2: readmitted, 3: deceased), readmission might be excluded from the analysis as OR cannot be calculated. I would recommend either to correct with multivariate analysis or to suppress it from the Methods and Results as the main study objective is descriptive.

- There is not linear regression (which outcome?) in the result section while it is stated that a linear regression was implemented. It should be corrected. In addition, given the high number of tests, there is an increased risk for falsely significant result, I would recommend either to add a correction method for multiple testing or to limit the number of tests as some results can be only descriptive but not comparative.

- The inclusion of confirmed cases only is a positive point. However, virological diagnosis tests that were used must be detailed in the Methods section. Was there any change compared with previous year?
- Incidence rates of HAI are not reported. It would be interesting to report information on the overall incidence or attack rate in the hospital, and if possible by unit (instead of reporting the number of cases (cf. Figure 3). Ideally, a comparison of incidence with previous year would give additional information on the potential increased of HAI cases compared with previous year.

- Figure 4. The incubation period of influenza is not the same than the infectious period (approximatively from -1d to +5d after onset), information on the infectiousness compared with the incubation might be added in the manuscript. The synoptic chart is interesting, but it would be useful to add potential transmissions between patients or the infectious period.

Minor comments

- L32, Abstract:

- L82, Background: The hypothesis and objective is not clearly stated. Please detail this point in this section.

- L85, Methods: this is a surveillance based study

- L112, Methods: The reference of the logistic regression is not stated. According to the result I suppose that it is HAI, replace it by CAI as a reference would be more interesting. Tested variable might be noted.

- L116, Methods: what are the thresholds for multivariate analysis?

- L125-6, Results: Was the definition of HAI the same in the previous year?

- L150-2, Results: This definition can be moved to the Methods section.

- L184, Results: Were patients moved into double rooms with ILI or influenza case?

- Results: It should be useful to have some descriptive data on the hospital: number of admissions /y, type of departments, type of buildings, etc.

- Results: I understand than the surveillance concern only patients, however healthcare workers (HCWs) are important triggers of nosocomial influenza. During your investigations, did you find evidence of HAI among HCWs. Were some symptomatic HCWs tested for influenza. In addition, information on the mean vaccination coverage of HCWs should be interesting.

- L299, Discussion: epidemiological analysis revealed good concordance with contact studies (RFID) and typing. Please add a corresponding reference.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
No

**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?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

**Declaration of competing interests**
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.
I am bioMérieux employee since January 2018.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal