Author's response to reviews

Title: Timeliness of National Notifiable Diseases Surveillance System in Korea: a cross-sectional study.

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Author's response to reviews: see over
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Dr. Melissa Norton
Editor-in-Chief
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RE: MS: 1671841257226698
“Timeliness of National Notifiable Diseases Surveillance System in Korea: a cross-sectional study”

Dear Dr. Norton,

I would like to thank you and the reviewers of “BMC Public Health” for taking the time and effort to review our manuscript. You and your editorial staff have provided us with a comprehensive and valuable review. We have tried our best to abide by the recommendations and comments. The revised and added parts of the manuscript have been underlined for your convenience.

We believe that these revisions greatly strengthen our manuscript and hope that this better meets the requirements of your journal. We thank you again for your constructive and detailed review, and will be waiting for good news in the near future.

Sincerely,
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Authors’ Response to the Comments

Major compulsory revisions:

Comment #1:
Methods – Why was >100 cases used as the cut off for disease selection? It seems important to include an example from Group 4 despite not having 100 cases/year.

Response #1:
We agree with the reviewer that it can be worthy to include Group IV example. Within Group IV diseases, dengue fever is relatively the most frequent (See Table A1 below). Therefore, we added dengue fever to represent Group IV in our manuscript. All tables and figures have been updated accordingly, with added descriptions in the text.

Table A1. The number of notifications of the diseases in Group IV

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue fever</td>
<td>6</td>
<td>9</td>
<td>13</td>
<td>7</td>
<td>32</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Babesiosis</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cryptosporidiosis</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Botulism</td>
<td>-</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Q fever</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

- : Not notifiable

Note. No cases of yellow fever, marburg fever, ebola fever, lassa fever, African trypanosomiasis, schistosomiasis, yaws, pinta, smallpox, severe acute respiratory syndrome (SARS), avian influenza infection in humans, tularemia, other newly emerged infection syndrome were notified.

Comment #2:
Results, “Cumulative distribution of time lags” – It is not clear how these results should be interpreted.

Response #2:
We added a new paragraph as below to better describe the interpretation of “Cumulative distribution of time lags.” (page 8, paragraph 2)
“The graph not only provides information on the median time lag by which 50% of the cases are reported for a specific disease, but also presents the overall shape of the time lag distribution. The higher curve indicates generally shorter time lags than those for lower curves. For example, $T_C$ curves show that at 10 days from the onset, more than 75% of mumps cases are notified to KCDC whereas approximately 50% of shigellosis and 25% of typhoid fever cases are notified, respectively. Comparing the cumulative distribution curves is much more informative than comparing fewer parameters such as median or mean, or proportions notified by given times.”

Comment #3:
Results, “Cumulative distribution of time lags”, 4th sentence – The use of the phrase “significant variation” implies statistical significance. A statistical comparison would be helpful.

Response #3:
We fully agree to this comment. Difference in the shapes of cumulative distribution curves can be tested by two-sample Kolmogorov-Smirnov test (Kanji, 1999: 100 statistical tests, SAGE publications). This test takes the maximum difference between two curves at any X value (days of lag time in our study), and calculates the p-value for such a discrepancy. We described the test results in the Methods section and Results section as below.

Methods (page 6, Statistical analysis)
“Two-sample Kolmogorov-Smirnov (K-S) tests were used to compare cumulative distributions of time lags between diseases [16].”

Results (page 8, “Cumulative distribution of time lags”, 2nd paragraph, 2nd sentence)
“Relatively large variation among diseases is apparent in both $T_C$ and $T_R$; mumps (Group II) with the shortest and dengue fever (Group IV) with the longest time lags ($p<0.0001$, by K-S test).”

Comment #4:
Discussion – The focus on the individual diseases throughout the Discussion eventually is too narrow a perspective. After the examination of timeliness by disease, the Discussion should broaden its scope into if/how those diseases are...
representative of the Groups they are in and what the difference in timeliness between Groups means for public health practice around those types of diseases.

Response #4:
This is a great point and good suggestion. We restructured Results and Discussion so that the assessment of individual diseases is based on the characteristics of disease groups. In addition, we added the following sentences to emphasize such perspectives (page 11, paragraph 3).

“The different patterns of time lags among the diseases examined suggest that there are common features among the disease groups, and strategies for better control should be developed specifically for each disease group. Such patterns by disease groups arise largely from the commonality of clinical and epidemiological nature, and the characteristics of surveillance policy as in Korea.”

Comment #5:
Figure 3 – The different lines are not clearly distinguishable. The lines for mumps and scrub typhus, which are indicated as being broken lines, do not seem to be in the graphs.

Response #5:
The line format of figure was corrected and improved.

Minor essential revisions:

Comment #6:
Abstract Conclusions – The first sentence is not derived from the background and results shared in the Abstract. The Conclusions should focus on what the reader can conclude from what has been shared in the Abstract.

Response #6:
The point was well taken. As recommended, the first sentence of the conclusion was re-written to clarify the conclusions (page 3, sentence 1).

“Time from disease onset to diagnosis generally contributed most to the delay in reporting.”

Comment #7:
Background – Additional information about the number of diseases in each group and a few examples (not used in the study) should be included.

Response #7:
This part was revised as below (page 4, paragraph 3).

“NNDSS classifies infectious diseases into four groups: Group I for those requiring immediate control measures – 6 diseases (for example, cholera, plague, shigellosis); Group II for vaccine-preventable diseases – 9 diseases (for example, measles, mumps, rubella); Group III for diseases that need routine monitoring – 16 diseases (for example, tuberculosis, scrub typhus, malaria); and Group IV for emerging diseases in Korea – 19 diseases (for example, dengue fever, q fever, avian influenza infection in humans).”

Comment #8:
Methods – Why did the authors include an explanation for why tuberculosis and malaria were not studied? The reader is left wondering if there were other diseases that also warrant an explanation.

Response #8:
The paragraph was revised as below to clarify the reasons for exclusion (page 5, Data collection, sentence 4—6).

“Two diseases with more than 100 cases every year, tuberculosis and malaria had to be excluded because of insufficient information. Tuberculosis had been traditionally managed at the PHC by a different system, which did not include complete data on dates after physicians’ notification step. Malaria cases included approximately 20% of
the reports from military personnells covered by a separate reporting system within the military, and the information was not comparable for the current analysis.”

Comment #9:
Results, 1st paragraph, 2nd sentence – Include a proportion for each of the diseases listed.

Response #9:
The proportions were included as below.

“Scrub typhus comprised the largest number of cases (57.9%), followed by mumps (23.5%) and shigellosis (9.5%).”

Comment #10:
Results, 1st paragraph, 6th sentence – Was the difference in reporting proportion between shigellosis and mumps statistically significant?

Response #10:
Since dengue fever was added according to the reviewer’s comment, we included the statistical test results as below.

“For example, doctors’ timely reporting to the PHC was highest for shigellosis (85.3%) and lowest for dengue fever (60.2%) (p<0.0001, according to Chi-square test), although the limits were both 1 day.”

Comment #11:
Discussion – Were there are any outbreaks during the years of interest that could enhance the discussion on timeliness?

Response #11:
Thank you for this insightful comment. We added the following paragraph in the discussion on the influence of outbreak (page 10).
“Occurrence of an epidemic is likely to have similar effects. In fact, notifications of shigellosis in this study included 1,076 cases identified by KCDC as part of several different epidemics. Although in-depth analyses of these cases are beyond the scope of the current paper, the median T_C and T_R of the epidemic cases were shorter (8 and 5 days, respectively) compared to those of the other 2,801 non-epidemic cases (9 and 6 days, respectively).”

For your reference, we show cumulative distribution curves for epidemic and non-epidemic groups below. However, we did not include these graphs in the paper because the identification of epidemics involves further methodological issues that are beyond the scope of this study.

Figure A1. Cumulative distribution of time lags of shigellosis for epidemic and routine cases.

![Cumulative distribution curves](image)

**Comment #12:**

Discussion – Reporting to the US CDC is not voluntary.

*(Comment from Editorial Board)*

- I am not certain whether one of the reviewers is correct that tuberculosis reporting is mandatory in the US: it is definitely mandatory at all State levels, but it might still be voluntary from State to CDC (at least it was so in the past). The authors should be checking what applies.

**Response #12:**
We removed the imprecise sentence that might lead to misunderstanding.

**Discretionary revisions:**

**Comment #13:**
Discussion – The paragraph about the comparison to findings in other countries can be condensed.

**Response #13:**
We deleted the lengthy comparisons and condensed the part as below (page 9, paragraph 3).

“Generally, we found shorter time lags compared to previous reports for these diseases. For shigellosis, we found a median $T_C$ of 9 days, whereas the $T_C$ ranged from 15 to 23 days in previous studies [2, 8, 10]. For typhoid fever, the median $T_R$ was 15 days, in comparison with approximately 22 days in a previous study in England [11]. Electronic reporting systems can be an important means to enhance timeliness, as previously suggested [9, 10, 15]. Our results showed generally shorter time lag than those of the previous studies using data from conventional systems.”

**Comment #14:**
Discussion – The paragraph discussing the importance of timeliness has already been discussed in the Introduction.

**Response #14:**
We eliminated the duplicated paragraph from discussion.