Reviewer's report

Title: Estimating the case numbers of hand, foot and mouth disease among children under-five in Beijing of China based on a telephone survey of healthcare-seeking behavior

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Reviewer: Mark Riddle

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Major Compulsory Revisions:

1 - In the methods section the authors describe use of the Beijing Immunization INformation System to sample telephone numbers for the survey. What percent of the population has access to a phone? How representative is the sample given a proportion of the population does not have a valid phone number to be called? roughly 35% were not able to be contacted. Why is this? Is this non-contacted population similar to the contacted population based on demographic (socioeconomic factors)? The authors should consider this potential bias and discuss generalizability of the results based on reliance of this phone system.

2 - Case definition issues. The differential diagnosis of HFMD is quite broad with some diseases being common. How did the author’s rule out these other conditions to avoid misclassification in the self-reported case definition. Was this self-report definition validated in any way? Some of the common differential diagnosis are listed below:

- Enteroviruses
- Erythema Multiforme (Stevens-Johnson Syndrome)
- Herpangina
- Herpes Simplex
- Herpes Zoster
- Kawasaki Disease
- Pharyngitis, Viral
- Toxic Epidermal Necrolysis

3 - Results, page 5 describes that children ages 2-4 were more likely to seek healthcare than children under 2 (81 vs 75.2%, p=0.036). based on table two, the 95% confidence intervals of these point estimates overlap, therefore it is unclear how this is a statistically significant difference. What test was used? Recommend including numbers as well as percents in the table so that statistical analysis can be checked.

4. Year to year variations - the analysis is based on a single year. The authors should consider how generalizable a single year of data is in the stability of
HFMD estimates over time. Might the year analyzed have represented an epidemic and thus artificially skew the data? The authors need to consider such in their discussion.

5. Discussion: There is not mention of incidence rates of HFMD to other countries or even regions in China. It would be most informative to compare the rates the authors describe with similar incidence estimates provided from other relevant regions/countries of the world.

6. Statistics: the statistical methods section lacks adequate detail to assess the validity. As described above, there appears to be a p-value of significance despite overlapping 95% confidence intervals between the point estimates comparing two groups. It is unclear how confidence intervals were obtained for complex calculations such as estimated cases and estimated rates. The authors report median case numbers (Table 3) and 95% confidence intervals. This is not normally done, usually mean and 95% CI are reported, OR median and interquartile ranges.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.