Reviewer's report

Title: Sentinel surveillance system for early outbreak detection in Madagascar

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Reviewer: Salah Mahmud

Reviewer's report:

The authors are to be commended for designing and implementing an innovative sentinel surveillance system, and for their willingness to share their experience with others. I hope the following comments are of some help to the authors.

- Major Revisions

1. If possible, provide a brief description of any surveillance systems (syndromic or otherwise) for febrile/diarrheal illnesses that may have existed in Madagascar when the new sentinel system was being designed and implemented. This essential context could help the readers understand the full significance of the new system. If such systems existed, were they replaced by the new system? If not, how does the new system complement the older systems?

2. The criteria for selecting a sentinel site are mentioned briefly (e.g., care level, no of GPs). It will be helpful if the authors could expand on this important element of the system design (e.g., what is meant by care level? What is the cutoff point for no of GPs used to institute a sentinel center in particular area?)

3. The case definition for suspected malaria cases (fever) seems very non-specific and overlaps with other case definitions (e.g., ILI, arbovirus). Please clarify whether a more specific presentation for malaria was used (e.g., periodic or recurring fever patterns). Also, please specify the name (and give reference if possible) for the rapid diagnostic test used to diagnose malaria in the clinics.

4. The arbovirus case definition could overlap significantly with ILI. Was that a concern when the system was designed?

5. Please, clarify how “aberrations” and “signals” of potential outbreaks were detected. Was that based on comparisons with seasonally-adjusted averages or other baseline measures of syndrome incidence? How much deviation from baseline was required for 10 suspected outbreaks to be reported to the district health authority? This is important because the interpretation of syndromic surveillance data is usually a significant challenge. Achieving the right balance between sensitivity and specificity is not easy.

6. Since the implementation of this system, were there any outbreaks that were not detected by the sentinel system? In other words, what was the sensitivity of the system for outbreak detection?

7. Not sure what the authors mean by “selection bias” in reference to the fact that GPs were self-selected. Certain areas may have lacked GP volunteers, but that would not be considered selection bias. It will simply mean that the system is not...
sensitive enough for the purpose of detection of outbreaks from those areas (i.e.,
the system is not representative of the whole country, which is different from
being “biased”).

8. When evaluating a surveillance system, there are other important
considerations that the authors did not discuss. The authors discuss in detail the
system costs and certain operational aspects (e.g., data transmission). However,
there is little discussion of other important aspects of the system including the
validity of outbreak detection (e.g., the positive predictive value of the detected
signals) and timeliness of the detection (e.g., was the new system able to detect
outbreaks early on? and if so by how much? Could these outbreaks have been
detected in a reasonable time even in the absence of this system?). Other
important considerations include acceptability of the system to its users (e.g., GP
adherence rate). System costs should also include the time cost to the volunteer
GPs.

9. In the absence of some of these important details, it is difficult to assess
whether the authors’ conclusion re the benefits of implementing this system were
justified.

- Minor Revisions

1. Please clarify the meaning of the following statement “In general, virological
indicators do not allow normal viral circulation to be distinguished from a potential
epidemic situation. Actually, the essential elements needed to plan for the
prevention and control of epidemics cannot be obtained from a system based on
virus surveillance alone, but requires a system based on combined epidemic
criteria." It is not obvious to me what the authors mean by “virological indicators”
and “combined epidemic criteria.”

2. The WHO ILI case definition is fever and cough OR sore throat. The authors’
case definition is more specific (cough AND sore throat). What is the rationale for
using the less sensitive case definition?

3. I am curious why axillary temp was used to define fever instead of more
accurate methods (oral temp in adults and rectal temp in children). Was this
decision based on the preferences of the participating clinicians?

4. The section labelled “supervision” is more of commentary rather than a
description of the methods. It should be moved to the discussion section.

5. Figure 2 is not described in the text. It is not clear what was the purpose of
including this figure, as it mostly duplicates the information presented in figure 5.
The information presented in Figure 4 is not interesting and the figure could
therefore be deleted.

6. The following section labelled “ability to detect outbreaks” belongs to the
results rather than the methods section.

7. Please spell out MoH when first mentioned.

**Level of interest:** An article whose findings are important to those with closely
related research interests
Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
-I do not have any conflicts of interest, financial or otherwise, with regard of the authors or with the contents of the paper.