Author's response to reviews

Title: Developing Open Source, Self-Contained Disease Surveillance Software Applications for Use in Resource-limited Settings

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Author's response to reviews: see over
Katz review points:

1) Lacks description of how these systems fit into, or compare/contrast with the other syndromic surveillance systems being designed for resource poor environments. Paper would be stronger with a description in the introduction of the other systems being developed and deployed for the same purpose and how the ESSENCE systems differentiate themselves.
   a. When this paper was first written, we reviewed all the peer-reviewed literature we could find on syndromic surveillance systems in resource poor environments and included them as references in the Introduction. We have now repeated the search for 2011 and more recent papers and did not find any additional publications. While we have no doubt other systems have been deployed in resource-limited regions, and we are aware of some anecdotally through our collaborations, peer-reviewed publications describing these specific systems are very limited at present. The problem may be that these projects have not yet reached the publication stage. Indeed, our own paper is being submitted as a Technical Advance because there has not yet been enough time to collect and analyze sufficient data for a more robust research paper.

2) Need to revise statements about IHR to more accurately reflect the purpose of the regulations.
   a. As suggested, the purpose of the IHR is now more accurately described.

3) Should explain in the Background that early detection leads to early response.
   a. We revised both the Abstract and Introduction to include this important fact.

4) Correct the IHR statement to say that the regulations entered into force in 2007 and that there are now 195 Member States (not 194) which had until the summer of 2012 to be in compliance or ask for an extension. Also, revise the sentence in which it is quoted about the significant harm to humans and instead say it would be a public health emergency of international concern.
   a. The IHR sentences were based on the status in December 2011, so we have updated them. The sentence with the quote was also revised as suggested.

5) Use a better example than the 2009 H1N1 pandemic for the emergence of a disease threat in a resource-limited area.
   a. The example was replaced as suggested.

6) Specify that the authors worked with local military as opposed to US military in these resource-limited countries.
   a. We changed this to say “local military” instead of just military. In addition, we added why the US military would sometimes be involved and included a reference.

7) Reviewer wants us to reassure her that the partner nations are okay with being referenced in this paper.
   a. After further consideration, we decided it best to not list specific countries with the exception of relationships that have already been presented publicly, which is the case with the Philippines and Peru. We thank the reviewer for this important advice and have revised the paper to mention only regions for countries other than Peru and the Philippines.

8) On page 7, use a different term than “computerizing.”
   a. We have revised that sentence to state more explicitly what was meant by the term.
Freifeld review points:

1) The paper presents relatively limited results to date. The main result is from the pilot of EDE in Philippines, stating that “within a month of implementation of fever case data collection, 30% of the local health clinics were using SMS texting to send daily fever case reports to the city health office.” Reduction of reporting lag from 2 weeks to 1 day is an important and impressive result.

(a) What was the uptake beyond the 1-month period? (b) Was there any potential to expand beyond the pilot, in terms of capturing more syndromes, or increasing integration with PIDS? (c) Was there any known impact on public health decision-making, or population morbidity or mortality? Is there any data from the pilot that you can show in the paper? (d) Was there sufficient local IT expertise to maintain and troubleshoot the system, or at least potential for training?

   a. We have added that the SMS reporting further increased to 90% within 2 months of implementation.

   b. Expansion beyond the pilot has occurred. For example, the Philippines health departments decided to expand the SMS data inputs to all of Cebu City. Initially, EDE was used to monitor the fever syndrome, which is pretty broad. In Cebu City, that remains the primary concern of the local health department and they are less interested in expanding to other syndromes. EDE is now integrated with PIDS and is being used to monitor temporal trends of all diseases that are notifiable in the Philippines. We have revised the text accordingly.

   c. This paper was submitted as a Technical Advance because not enough data have been collected or analyzed to date for a Research article. We should emphasize that our primary focus has been on capacity building; i.e., giving these countries the independent ability to collect and analyze their own data. Because of this, we typically do not have access to their data nor do we necessarily desire access to their data. We do have anecdotal reports such as they saw a disease spike in the system and responded by spraying. However, sufficient data or analysis to demonstrate objectively a known impact on decision-making, morbidity, or mortality is not currently available. We have revised the text to clarify our primary focus at the end of the Background section.

   d. While skilled IT professionals can be difficult for public health departments to find and retain, our software applications have so far been simple enough that IT skill has not been a significant limitation. Instead, the main obstacle for use is changing the mindset of the public health professionals who are more accustomed to examining weekly or longer period data because that is what they have been doing for years. With these new systems, they now have the ability to examine daily data and it is taking some time for them to become accustomed to doing this.

2) Another important aspect of the study is the process of soliciting input from potential users and then how the authors worked to create and adapt systems to meet their stated needs. The process of gathering input, across several countries, is alluded to in the Background section (p. 6). Then, presumably results from this work as well as the pilot experience are presented in the
Discussion section as a numbered list (p. 18). (a) It would be worthwhile to me as a reader to understand more about this process: how interviews were conducted, specific points made by users, experiences from the pilot deployment, etc to support the list on p. 18. (b) While I fully believe the 6 numbered points, as it stands they’re not supported by evidence in the paper.

a. We follow a rapid prototyping and technology insertion process for developing syndromic surveillance systems in close collaboration with local public health departments, based upon our past twelve years of experience with providing ESSENCE to local public health departments in the US. A formal scientific survey has not been conducted to date. The list of points was based upon the distillation of our experience in talking with local people about how they feel about their systems and any desires for specific features. A better explanation has been added to the text.

b. The list of points is based upon qualitative responses to informal inquiries about their experiences with the system. Having only been recently deployed, it was very important that they begin using these systems. As mentioned above, our primary focus is on capacity building. Therefore, we wanted their immediate, although informal, feedback in order to rapidly respond to avoid delays in usage. The emphasis has been on persuading the public health people to begin using these systems. Only after enough people begin using them routinely over a period of time could objective surveys be performed for more quantitative analyses. We have revised the text to explain the above.

3) Even preliminary results or experiences from deployment of the OE system would be interesting to include. The paper says that it was only recently deployed in 2011. (a) Any insights from the initial deployment experience? (b) What country was it deployed in?

a. As mentioned above, formal scientific surveys have not yet been conducted. This is a Technical Advance paper for which there are limited preliminary results. Additional insights are described in our responses to 4a) and b) below, and these have been incorporated into the revised paper.

b. The other reviewer made an excellent point about the sensitivities of the countries being mentioned. Therefore, upon further consideration, we removed mention of any specific country unless they had already presented our relationship in a public venue. The only two countries who had done so were Peru and the Philippines. We replaced the names of the other countries with regions such as Africa, Southeast Asia, and Central America. Unfortunately, that means we cannot yet mention the countries in which OE is deployed.

4) (a) What are future directions for the software projects, in terms of new features, user interface improvements, etc.? (b) Any key lessons learned from the deployments that have re-oriented the team’s focus?

a. The future direction is to continue using and improving software that is readily available and easy to maintain. We plan to keep the user interfaces as simple as possible and to use individual software components that are easily integrated and can be maintained
without requiring someone with a great deal of IT experience. We have revised the text to reflect this.

b. In addition to those mentioned in a) above, the key lessons are make certain you interact with the appropriate levels of the local government and identify key individuals who can serve as champions of the project, including those involved in local policy and financial matters, in addition to talking with the actual users of the system.

5) “From Table 1, it appears that Open ESSENCE has all the features of Enterprise ESSENCE. Is there any plan to simply convert all internet-enabled ESSENCE sites to Open ESSENCE? If not, why not?

a. Open ESSENCE does not have all the features of Enterprise ESSENCE. Enterprise ESSENCE has more features, includes proprietary software, and is designed to utilize automatic secure electronic data feeds via the internet. In contrast, OE currently utilizes active user data input because automatic electronic data feeds are typically lacking or unreliable in resource poor countries. Table 1 does list the main differences between Enterprise ESSENCE and OE. For example, Enterprise: ESSENCE uses proprietary 3rd party software while OE does not; and Enterprise ESSENCE does not support language and font internationalization while OE does.

b. Because moving from Enterprise ESSENCE to OE is not a simple conversion process, there are currently no plans to convert all instances to OE. OE is specifically designed with resource limitations in mind, while Enterprise ESSENCE is not. Furthermore, the Enterprise ESSENCE data sources are mostly automatic secure internet data feeds, which is not the case for OE. We have added an explanation to the text.