Understanding How Maps Work in Infectious Disease Response

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Abstract:

The role and value of cartography and geovisualization in infectious disease management and response is not well understood. While maps and geovisualizations clearly play important roles in supporting ongoing disease surveillance and analytical work to understand and predict disease dynamics, we do not have much knowledge regarding when maps work well in these contexts, and in which cases they might provide limited utility.

In an ongoing project, we have sought to systematically evaluate the strengths and weaknesses associated with current approaches to mapping in the context of infectious disease surveillance and response efforts by Médecins Sans Frontières (MSF). MSF is a major non-governmental organization that routinely engages in such work in a variety of challenging global contexts. Through a series of focus groups with epidemiologists, geospatial field specialists, and geospatial advisors at MSF, we have begun to uncover which challenges and opportunities are present for mapping and geovisualization in the context of infectious disease response work.

The intended outcome of this work is to carefully assess user needs as they pertain to next-generation geovisualization support in infectious disease surveillance and response. Our initial results demonstrate how geospatial advisors triage incoming requests for geospatial data and services, including deploying personnel to field sites directly. Field specialists receive directives from advisors and produce maps/data on site for near-term use. The epidemiologists we interviewed included field-deployed experts as well as professionals working remotely to incorporate geospatial information into ongoing disease analysis to predict outcomes and plan interventions.

A variety of mapping workflows are present in our results, and our participants have noted a range of challenges related to data quality and uncertainty. Looking ahead, participants identified new initiatives which could further expand the value of mapping and geovisualization as means for accelerating the delivery of aid and vaccines to save lives.

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