



## Vaccination in humanitarian crises: satisficing should no longer suffice

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Received 22 May 2014; revised 9 July 2014; accepted 9 July 2014

There are more possible vaccination interventions to mitigate the adverse health consequences of populations in crises than ever before, but recent reviews suggest delivering these vaccines has been fraught with difficulty. The decision to implement vaccination interventions in crises remains, more often than not, an exercise in satisficing. The sparse credible epidemiologic and effectiveness data in populations affected by crises contributes greatly to decision-making difficulty, as do the limits of vaccine presentations, formulations and storage. Political considerations and lack of decision-making guidance contribute further. Moving forward requires sound effectiveness studies to help ensure that decision-making is based to the degree possible on substance.

**Keywords:** Crises, Humanitarian, Vaccination, Vaccines

As of the end of 2013, there were about 10.4 million refugees, 28.8 million displaced persons and about 1 billion persons living in 40 so-designated ‘fragile states’, as well as almost 400 country-level natural disasters, affecting almost 300 million people.<sup>1</sup> In addition, particularly in Sub-Saharan Africa, many populations remain in a permanent state of vulnerability.

Fortunately, at no time in history have there been as many possible vaccination interventions to mitigate the adverse health consequences of populations in crises. Unfortunately, recent reviews suggest delivering these vaccines has been fraught with difficulty, with vaccines either underused or inappropriately used interventions in crises.<sup>2</sup> Identifying the genesis of these difficulties is problematic and multifactorial. The decision to implement vaccination interventions in crises remains, more often than not, an exercise in satisficing.<sup>3</sup> Satisficing can be summarized as the tendency to select the first option that meets a given need and/or selecting the safest decision given the knowledge available and/or failing to consider hidden aspects of the problem from an overarching view; thereby, failing to live up to the explicit and sometimes implicit objective of reducing morbidity and, therefore, mortality. Of the multitude of reasons that satisficing remains prevalent, four aspects contribute to the predominance of this heuristic.

First, the sparse credible epidemiologic and effectiveness data in populations affected by crises contributes greatly.<sup>4,5</sup> As development and rollout of new and underutilized vaccines continues, we will certainly understand more about the epidemiology of vaccine preventable disease. Studies addressing vaccine response in vulnerable populations, for example acutely malnourished children, should be encouraged. Further, exploring the underperformance of oral vaccines in vulnerable populations remains an

important issue. In the meantime, the lack of epidemiologic and immunologic data with which to center the discussion makes decision-making all the more difficult in crises.

Second, the limited presentations, formulations requiring multiple doses at short intervals and storage requirements of vaccines also encourage satisficing. Although presentation and formulation are of the utmost importance, the cold chain and storage issues present, arguably, one of the greatest barriers.<sup>6,7</sup> The cold chain is important to reduce the potential risk of vaccine degradation by either exposure to high or low temperature and was designed to ensure simplicity by following a single set of rules for all vaccines.<sup>8</sup> However, it involves high costs and logistical requirements, which are increasing with the introduction of new bulkier vaccines. This can especially be an issue in crises where cold chain equipment and infrastructure is most likely lacking or insufficient. The need to conduct several campaigns within a short time-frame and the inability to keep vaccines at the recommended storage conditions may restrict the decision-making horizon as to which vaccination interventions are implemented.

Third, in terms of political considerations, the highly politicized nature of epidemics, with clear and real difficulties to declare epidemics, has led often to hesitancy to implement vaccination interventions in response to epidemics.<sup>9</sup> Declaration of epidemics entails an implicit recognition of a failure of control and prevention programs. Debates around the appropriate timing of their use, when is it too late to implement a vaccination intervention in response to an epidemic or during a crises, the effectiveness of the vaccines and the risk of vaccination interventions potentially diverting resources away from case management interventions all aggravate decision-making.

Fourth, adding to the tendency to satisfice is the lack of decision-making guidance. At its essence, it is often forgotten that vaccination in crises is delicate. It is a multiple class problem with many facets and there is not an expert panel in the world that can provide overarching guidance applicable to all possible scenarios. Satisficing is especially problematic and inefficient when the stakes are high and time is limited. Clear guidance on how to evaluate the risk of vaccine preventable diseases and how to consider the potential effectiveness of interventions is essential to support decision-makers. Being able to demand the right type and amount of relief at the right time can best be done when those advocating for it, within or outside the corridors of power, are able to present their reasoning in a scientifically sound fashion; thus, focusing the discussion on substantive matters and reducing the scope for dismissing the evidence.

WHO recently convened a working group to address this issue and the results of this work provide at least a framework with which to base decisions.<sup>10</sup> Use of this framework can help overcome the often ingrained response of having what agencies know how to do, or using only those vaccines that are available. This framework is a step in the right direction to ensure that the needs take supremacy over what can be delivered, but more work is needed to ensure that additional work follows from this proposed framework.

There are several ways forward that can help to reduce satisfice-based decision-making for vaccination intervention in crises. First, funding and supporting sound epidemiological documentation projects and effectiveness studies would help ensure that decision-making is based to the degree possible on substance. With robust data and effective high coverage interventions, political difficulties may not disappear but are minimized. Second, with respect to the vaccines themselves, continuing the debate around the use of adjuvants to reach successful immunization with a single dose of vaccine, and use of vaccine in a controlled temperature chain, would simplify vaccination activities and, consequently, the decision to protect populations from identified risks. Adapted presentations, formulations and storage requirements can be achieved by engaging with manufacturers prior to licensure and WHO prequalification, and promoting research that considers the different contexts where vaccines are used. Third, ways forward with respect to de-politicization of epidemics are less clear. Additional efforts need to be made to encourage epidemic declaration and call for interventions without political penalty. Fourth, the new WHO framework needs to be evaluated to assess to which degree it reduces satisficed-based decisions.

Finally, depending on the agency and funder, the decision to implement an intervention during a crisis may not always be

taken in consultation with the population or with those delivering the intervention. Ensuring that the populations who will benefit from the interventions are included in the decision process may introduce complexity, but lies at the crux of ensuring vaccines reach those that need them most.

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**Authors' contributions:** RFG and AJ-G conceived the article, researched the data, discussed the content and drafted the manuscript. Both authors read and approved the final manuscript. RFG is guarantor of the paper.

**Funding:** None.

**Competing interests:** RFG was a participant in the WHO working group on vaccination in acute humanitarian emergencies.

**Ethical approval:** Not required.

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