Outbreaks of cholera in the time of Ebola: pre-emptive action needed

Although the pace of Ebola transmission has slowed in Liberia, Guinea, and Sierra Leone, its threat continues to limit the ability of local health-care systems to provide standard care, let alone respond to other health emergencies. These three Ebola-affected countries typically have cholera outbreaks every 3–5 years, with epidemics often spreading regionally. Cholera is now circulating in the region: epidemics are ongoing in Ghana and Côte d'Ivoire;[1,2] the latter sharing a border with Liberia and Guinea. Ebola-affected countries might no longer be able to mobilise the substantial emergency staff and resources needed to avert deaths in the face of a cholera epidemic. We urge the public health community to weigh the possible consequences of simultaneous outbreaks of Ebola and cholera against the costs and feasibility of pre-emptive interventions.

Use of oral cholera vaccine (OCV) should be considered to help avert an additional humanitarian catastrophe in Ebola-affected countries. Although the general supply of internationally licensed OCV is scarce, we propose two strategies for the efficient deployment of cholera vaccine: within each Ebola-affected country, the highest cholera incidence during the past five years occurred in distinct areas (figure), which could be prioritised for pre-emptive vaccination; and in neighbouring countries, where cholera is circulating, delivery of OCV to key populations could be used to contain the epidemic. Restrictions on mass-gatherings and community perception of vaccination within Ebola-affected countries must be considered with any campaign design. We urge the Ministries of Health of both Ebola-affected countries and neighbouring cholera-affected countries to commence discussions with partners about the feasibility and potential effect of preventative OCV campaigns or the preparation for rapid administration of OCV, as well as water and sanitation interventions, in response to an outbreak.

Clinical-care providers should also prepare for the potential diagnostic and case-management challenges simultaneous epidemics would bring. Diarrhoea and vomiting, typical symptoms of cholera, are frequently present in Ebola patients, which could lead to challenges in triage and potential cross-infections within treatment centres. Rehydration therapy is key to survival from both diseases but must be administered so as to reduce risks to medical personnel and patients.

The true risk of cholera in the Ebola-affected countries is unknown, and some aspects of the Ebola response (eg, hand-washing with chlorine) might reduce the risk. However, with cholera circulating in the area, careful preparation and pre-emptive action should be considered to mitigate or avoid a potentially deadly cholera epidemic.

ASA, JL, FJL, and SMM received grants from the Bill & Melinda Gates Foundation. DL declares no competing interests.

Andrew S Azman, Dominique Legros, Justin Lessler, Francisco J Luquero, Sean M Moore
azman@jhu.edu

Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA (ASA, JL, SMM); Delivering Cholera Vaccines Effectively Project, Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA (FJL, ASA); WHO, Geneva, Switzerland (DL); and Epicentre, Paris, France (FJL)

1 UNICEF. Cholera update in the west and central Africa region: regional update, 2014 (week 49). http://www.unicef.org/cholera/files/Cholera_regional_update_W49_2014_West_and_Central_Africa.pdf (accessed Jan 20, 2015).
2 Ministère de la Santé Côte d'Ivoire. Point de presse: épidémie de choléra en Côte d'Ivoire. Jan 9, 2015. http://www.sante.gouv.ci/index2.php?page=actu&ID=231 (accessed Jan 20, 2015).
3 WHO. Weekly epidemiological record: cholera. http://www.who.int/cholera/statistics/en/ (accessed Feb 13, 2015).
4 WorldPop Project. www.worldpop.org.uk (accessed April 1, 2014).
5 Pullan RL, Freeman MC, Gething PW, Brooker SJ. Geographical inequalities in use of improved drinking water supply and sanitation across sub-Saharan Africa: mapping and spatial analysis of cross-sectional survey data. *PLoS Med* 2014; **11:** e1001626.

Published **Online** February 20, 2015 http://dx.doi.org/10.1016/S0140-6736(15)60178-7

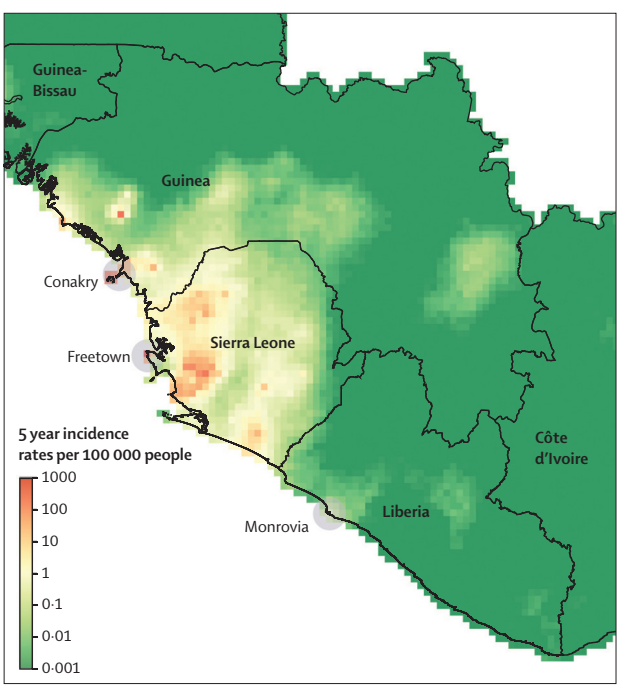

Figure: **5 year incidence rates of suspected cholera in Ebola-affected countries**
Spatially smoothed estimates based on reported cases between 2009 and 2014. Cholera case reports are from Ministries of Health, WHO,[3] and ProMED. We used population density estimates from WorldPop,[4] and water and sanitation coverage data from Pullan and colleagues,[5] to help distribute incidence to a finer geographic scale. Grey circles indicate capital cities.