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# Cholera vaccination beneficial, post-outbreak

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Researchers newly report evidence that vaccination against cholera can be beneficial even after an outbreak has begun.

Rita Reyburn, Dr. Lorenz von Seidlein, Dr. John Clemens and colleagues at the International Vaccine Institute (IVI) in Seoul, Korea analyze the impact that vaccination could have had on recent outbreaks around the globe in "The case for reactive mass oral cholera vaccinations", and Drs. Dang Duc Anh and Anna Lena Lopez and colleagues at IVI and in Vietnam report on the impact of such "reactive" use of vaccine during an outbreak in "Use of oral cholera vaccines in an outbreak in Vietnam: a case control study".

Both studies found a benefit to vaccination, and an accompanying editorial by Dr. Edward T. Ryan of Massachusetts General Hospital and Harvard University, "The Cholera Pandemic, Still with Us after Half a Century: Time to Rethink", comments on the significance of the works, especially in light of recent events in Haiti. The trio of publications appear January 25th in the open-access journal *PLoS Neglected* Tropical Diseases.

The recent outbreaks of cholera in Haiti, Pakistan, and Zimbabwe suggest that current global action plans against cholera are failing. "Although everyone agrees that the ultimate prevention and control of cholera will require provision of clean water and adequate sanitation to the world's population, the simple fact is that this will not be a reality for decades for the world's most impoverished, as well as for those affected by civil unrest and natural disasters," says Dr. Edward T. Ryan.

"Less clear is the role that cholera vaccine could play once an outbreak has started. Classically, cholera would cause intensive and short outbreaks - by the time the vaccine was distributed, it was thought that the window of possible benefit would have passed. However, Vibrio cholerae, the causative agent of cholera, has undergone a number of mutations in the last few years, and is now associated with longer outbreaks, and more severe clinical disease, leading to higher case totality rates and increased drug resistance." Because of all these features, researchers and public health officials have taken a new look at the potential role of cholera vaccine to help control outbreaks, combined with attempts to provide clean water and improve sanitation.

Reyburn and colleagues model the effect of cholera vaccine once an outbreak has occurred using data from a number of recent outbreaks. The researchers modeled 50% and 75% vaccine coverage, with completion of vaccination ranging from "rapid" (10 weeks after an outbreak was first reported), to a "maximum" of completion of vaccination 33 weeks after an outbreak is first reported. They found that even delayed responses could have benefit, and their model neither included herd effect modifiers, nor the effect that vaccination could have on subsequent disease burden after the initial outbreak has waned into an endemic situation.

Anh and colleagues describe a case-control study of the reactive use of the Vietnamese killed cholera vaccine during a significant outbreak in Hanoi. Administration of 1 or 2 doses of the vaccine was found to provide approximately 76% protective efficacy.

These reports will contribute to the discussion on the role that cholera vaccine could play in both short and long-term response plans, including the response in Haiti.

**More information:** Ryan ET (2011) The Cholera Pandemic, Still with

Us after Half a Century: Time to Rethink. PLoS Negl Trop Dis 5(1): e1003. doi:10.1371/journal.pntd.0001003

Anh DD, Lopez AL, Thiem VD, Grahek SL, Duong TN, et al. (2011) Use of Oral Cholera Vaccines in an Outbreak in Vietnam: A Case Control Study. PLoS Negl Trop Dis 5(1): e1006. doi:10.1371/journal.pntd.0001006

Reyburn R, Deen JL, Grais RF, Bhattacharya SK, Sur D, et al. (2011) The Case for Reactive Mass Oral Cholera Vaccinations. PLoS Negl Trop Dis 5(1): e952. doi:10.1371/journal.pntd.0000952