PUBLIC HEALTH

The Cholera Crisis in Africa

Long-lasting cholera outbreaks in Africa suggest limitations in the current strategy of disease control.

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In July 1994, 500,000 to 800,000 Rwandans crossed the border into the North Kivu region of Zaire (now called the Democratic Republic of the Congo, DRC). During the first month after the influx, almost 50,000 refugees died; cholera was a major contributor (*1*).

From 1995 to 2005, the largest number of cholera cases and outbreaks in Africa continued to be reported from this area of the DRC (*2*). Renewed fighting has displaced at least 250,000 people, making an already difficult situation worse for more than a million people living without clean water, food, or access to health care. By December 2008, the most recent cholera outbreak had affected 10,332 persons and resulted in 201 deaths (*3*). Cholera is also in the headlines in Zimbabwe. From August 2008 to February 2009, the number of reported cases was 70,643 with 3467 deaths (*4*). Cholera is also spreading to the neighboring countries of South Africa, Mozambique, Zambia, and Angola (*5*–*7*).

The management of cholera outbreaks has changed little over the last decades. Oral rehydration solution (ORS) is accepted as the cornerstone for rehydration, although for those severely dehydrated, intravenous fluids are life-saving. Provision of safe water and adequate sanitation can be established as emergency measures but are not guaranteed to remain once the outbreak ends.

The international community has responded vigorously within recommended guidelines. Physicians for Human Rights recently called on the United Nations to take responsibility for the Zimbabwean health system (*6*). The World Health Organization's (WHO's) Global Task Force on Cholera Control urged prioritization of prevention, preparedness, and response activities and an efficient surveillance system (*8*). The WHO's Disease Control in Humanitarian Emergencies program is helping with distributing ORS and chlorine tablets, finding funds to pay thousands of Zimbabwean healthcare workers, and providing better services in remote areas (*9*). Although these efforts have saved many lives, the rising cases and deaths point to the limitations of the current strategy.

Is it time to consider other options? An oral cholera vaccine was evaluated in Mozambique 5 years ago and showed ~90% protection against cholera of life-threatening severity, even in a population in whom a high percentage was infected by HIV (*10*). Internationally licensed and available, the vaccine has also been shown to confer herd protection against cholera among unvaccinated neighbors of vaccinees (*11*). To date, the WHO has been reluctant to consider vaccination as a strategy to contain cholera in Zimbabwe "due to its two-dose regimen, short shelf-life, high cost, and need for cold chain distribution" (*8*). There are certainly logistical complexities to administering a two-dose regimen in a setting as desperate and chaotic as Zimbabwe, as well as strategic choices to be made for how to target high-risk groups for vaccination. Yet delivery of this vaccine was feasible in three WHO-sponsored community demonstration projects in rural and urban sub-Saharan Africa (*10*, *12*, *13*).

Further complicating a recommendation to vaccinate is the existing dogma that "with the currently available internationally prequalified vaccine, vaccination is not recommended in an area where an outbreak has already started" (*14*). However, this dogma is based on a single analysis (*15*) that assumed that outbreaks are self-limited and short-lived, in contrast to cholera in Zimbabwe, which has been raging since mid-2008. If the blockade against potential use of oral cholera vaccines could be lifted, then public-health workers, ministries of health, international organizations, and donor groups could discuss how, when, and where the vaccine could be deployed. The cost of the only internationally licensed oral cholera vaccine (Dukoral, Crucell-SBL) is U.S. $7 to $12 (€5.25 to €9) per dose; a lower price is offered for WHO-supported programs. A potentially cheaper vaccine was developed in Vietnam; its technology was transferred to Shanta Biotechnics (India) and is in clinical trials (*16*, *17*). In the short term, the vaccination costs may be borne by donor foundations and international organizations.

The size and expected duration of the outbreak would seem to justify the implementation of mass vaccinations. The lack of flexibility to adapt to the circumstances is regrettable; for the people at risk it is a disaster.

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