

Communicable Disease Surveillance and Response in Uganda

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Scholarly Abstract

While outbreaks of communicable diseases have long presented an ongoing challenge in the developing world, within recent years the frequency of such outbreaks has risen sharply. Accordingly, it is clear that strong epidemiological surveillance and response is needed to improve the health of disadvantaged populations in developing nations such as Uganda. Such populations face the greatest threat from communicable diseases and are more likely to fall victim to illness due to their poverty. In Uganda, the implementation of Village Health Teams (VHTs) has laid the groundwork for establishing community-based surveillance and response systems that can provide early notification of outbreaks and prevent the unnecessary suffering that accompanies unrecognized epidemics. Local response programs can also help to identify opportunities for the implementation of sustainable preventive measures and health education activities that will be able to improve the overall welfare of those living in settings of poverty.

Author's Note

My experiences in Uganda have reinforced my belief that access to health care is a fundamental human right. After learning about the concept of Village Health Teams and their ability to improve healthcare in impoverished and isolated communities, I immediately knew that I wanted to convey their importance to others. Empowering Village Health Teams provides an opportunity to work with the poor to reclaim their right to health. While in Uganda, the high levels of poverty and disease that I witnessed confirmed my desire to pursue a career in medicine and to volunteer my time to work with the underserved.

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Community-Based Disease Surveillance, Prevention, and Response as an Essential Tool for Improving Health in the Developing World

In reflecting upon my first trip to Uganda in the fall of 2007 and my subsequent stay throughout the summer of 2008, I have become acutely aware of the need for communicable disease surveillance, prevention, and response in regions that are at-risk for outbreaks of epidemic-prone illnesses. Epidemiological surveillance and response is an integral tool for improving the health of disadvantaged populations, as they are more likely to fall victim to communicable illnesses due to their poverty. Providing routine surveillance in these locations can help prevent unrecognized outbreaks. Additionally, the increase in communicable disease outbreaks demands amplified surveillance of these pathogens in order to prevent large-scale epidemics. Such epidemics undoubtedly have the potential to threaten the livelihoods of those living in at-risk areas and may hamper the development of the communities in which they reside.

While studying at Kampala's Makerere University in the fall of 2007, my academic program allowed for a practicum period during which I researched the medical, social, and economic factors preventing more effective anti-retroviral therapy for HIV/AIDS in a rural area of Uganda. During my time at Makerere's School of Public Health I met Mr. Luswa Lukwago, an epidemiologist from the Uganda Ministry of Health (MoH). Mr. Luswa grew up in a rural village similar to many of those he visits as part of his fieldwork today. He has a master's degree in public health with a specialization in communicable disease outbreak response, and is currently earning his doctorate in public health. As a member of the Makerere/MoH Integrated Disease Surveillance and Response Program, Mr. Luswa fulfills his duties as a field epidemiologist and helps train the next generation of Ugandan public health workers. Throughout the semester I regularly stopped by Mr. Luswa's office to discuss the epidemic control efforts that he was helping to coordinate throughout the country. While my work at this time focused on HIV/AIDS treatment, my meetings with Mr. Luswa at the MoH provided me with a window into the epidemiology and surveillance activities of Uganda. My interest in these fields had been sparked and I knew that if I was able to return to Uganda, working with Mr. Luswa and his fellow epidemiologists would be at the top of my agenda.

Cholera

When I returned to Uganda in May 2008, I worked with Mr. Luswa at the Epidemiology and Surveillance Division at the MoH. Mr. Luswa and his colleague Dr. Joseph Wamala were coordinators of communicable disease outbreak response throughout the country. At the time of my arrival, one of their primary concerns was the increasing intensity of an outbreak of cholera in eastern Uganda.

Cholera is a disease caused by infection with the bacterium *Vibrio cholerae*. Among humans, the infection frequently presents mildly or asymptotically and only develops as severe illness in a small percentage of the population. However, in this symptomatic group, infection results in massive diarrheal discharge of a “rice-water” stool as well as intense vomiting. The *V. cholerae* bacteria exit the human body in this stool and can typically be found in bodies of freshwater. In many parts of the developing world, contaminated water sources provide the drinking water supplies for countless communities and therefore provide the link in the bacteria’s fecal-oral route of transmission. Following consumption of infected water, untreated cholera can cause death within hours of its onset. This rapid death is caused by massive fluid loss and the ensuing dehydration from the diarrhea and vomiting described above.

Typically, well-handled epidemics of cholera result in a case fatality rate (the proportion of recorded deaths among those presenting with the disease) of about two percent. However, the outbreak in eastern Uganda had a reported case fatality rate of about seven percent. In order to address the high number of deaths, the MoH sent Dr. Wamala to the east to evaluate the response capacity of the cholera-affected districts. He planned to assess the control effort and offer education and guidance to the local area health teams if needed. I was privileged to travel with him.

It must be noted that in many cholera outbreaks, inadequate treatment is frequently found to be the basis behind an unusually high amount of fatalities. However, before our departure, members of the humanitarian organization *Médecins Sans Frontières/Doctors Without Borders* (MSF) informed us that poor case management and treatment did not cause the high fatality rates in the eastern Uganda outbreak. MSF often handles much of the clinic duties of an epidemic response and they confirmed that their staff had been treating cases appropriately and were successfully training local health workers. Eventually, health officials and community leaders in the east revealed that many of the early cholera deaths occurred among people who had not been

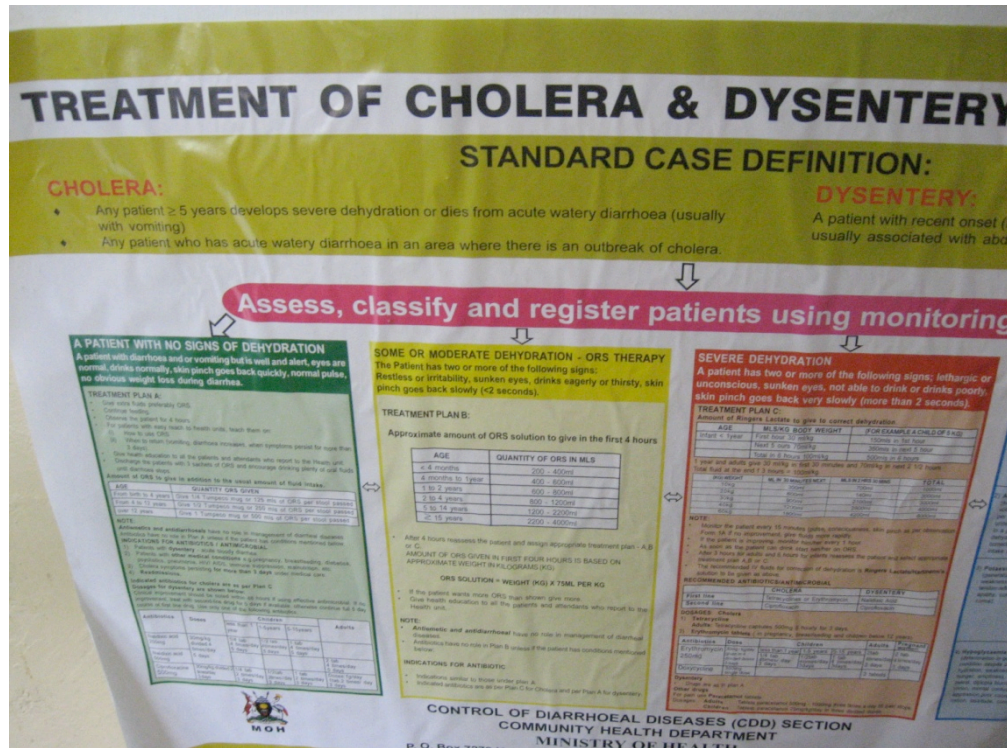
able to make it to a treatment center in time. Often the illness was not recognized as life threatening by the affected individuals, their families, or their peers. Eventually, they became too ill to travel to treatment centers to seek care.

To fully determine the specific factors that had discouraged local residents from seeking care, further investigation was needed at the community level. Due to the fecal-oral method of transmission of cholera, Dr. Wamala and our group from MoH conducted an assessment of sanitation and hygiene practices in the region. Once the team identified these factors, a corrective plan could be put in place to address them.

Village Health Teams and Cholera

In order to fully understand the importance of local engagement in an outbreak response, the concept and role of the Village Health Team (VHT) must be explained. VHTs are the “eyes and ears” of the control effort in any potential or confirmed outbreak. They are members of the local population who are elected by their peers and trained to recognize suspected cases of epidemic-prone diseases and to provide basic health education to their communities. While local healers have been mainstays in these communities for generations, the MoH only recently began an official program to organize and train VHTs in Uganda, beginning in 2000. With training assistance provided by organizations such as the World Health Organization (WHO) and UNICEF, VHTs were established in 40 districts (50% of the nation) by 2008.

VHTs, or “village doctors,” as they are sometimes referred to locally, are trained to identify individuals who present the standard case definition of a serious illness and require the attention of health facility staff. Additionally, they are trained to disseminate “Information, Education, and Communication (IEC)” materials, which alert the community to epidemic threats and promote healthy living. They are also trained in contact tracing, which entails following up on contacts of infected individuals during an outbreak of a communicable disease to help halt transmission chains. Lastly, the local knowledge and trust that VHTs possess is invaluable when outside investigators are navigating unknown terrain or attempting to gain insight on area-specific customs and practices that may be affecting disease patterns. As they are local residents themselves, VHTs understand the needs of their communities and can relay this information to others.



“Information, Education, Communication” (IEC) materials in an eastern Uganda health center during the response to the cholera outbreak.

In response to an outbreak of a disease like cholera, VHTs can dispense initial oral rehydration solution to affected individuals before their arrival at a treatment center. VHTs also provide instruction on maintaining healthy hygiene and sanitation within their communities, such as the need for consistent hand washing and the installation and use of proper latrines.



Training of VHTs on proper hand washing techniques.

During our meetings with the VHTs in the eastern, cholera-afflicted district of Pallisa, Dr. Wamala assessed the VHT members' general knowledge of epidemic-prone diseases such as meningitis, measles, and viral hemorrhagic fevers like Ebola and Marburg. He placed a special emphasis on the hygienic standards necessary to prevent and control cholera. Several of the VHT members were impressively conversant concerning the symptoms of cholera and the appropriate steps to take after recognizing a suspected case. There were, however, inconsistencies in the knowledge base of other members concerning these issues. Some members of the community were unaware of the symptoms of the disease and others did not know how it can spread. During some outbreaks, elements of sorcery may be blamed for the transmission of the disease and such beliefs can impede necessary interventions. Therefore, education about the fecal-oral route is an important aspect of social mobilization during a cholera outbreak as it helps prevent the spreading of inaccurate and dangerous misinformation.

Another issue that Dr. Wamala and I encountered in Pallisa was the reluctance of some members of the community to purify their water using chlorine tablets and construct new pit latrines in areas sufficiently isolated from communal water sources. Through conversations with the VHTs, we found out that the bitter taste that chlorine tablets produced when combined with

drinking water led to resistance to the use of these tablets among community members. Dr. Wamala explained to the VHTs that while we understood their concerns with the unpleasant taste, the crisis at hand required a compromise. Many of the VHTs then agreed to increase their water purification efforts.

Later, Dr. Wamala and I learned that new latrines were not being built due to a shortage of the concrete slabs needed for their surfaces. There was also a lack of understanding in the community concerning the immediate need to build new latrines. In addition to realizing the need to increase the availability of the slabs, Dr. Wamala urged the VHTs, many of whom had improper latrines themselves, to construct new, isolated ones and to encourage their neighbors to do the same. The importance of sanitation and hygiene during a cholera outbreak cannot be overstated, and failing to prevent infected latrine waste from contaminating water sources and neglecting to purify drinking water are two main vehicles by which cholera spreads. Based on the information gained in our meetings, Dr. Wamala and I realized that additional sensitization training of these community health leaders regarding sanitation and hygiene was imperative in order to completely end the epidemic.

After our departure, the Pallisa District implemented an unusual policy in an attempt to boost latrine construction. It mandated that residents of cholera-stricken areas who had latrines located too close to water sources would be penalized with the seizure of livestock until they constructed a proper latrine. While many local residents were clearly upset upon hearing this threat, the policy did succeed in encouraging proper latrine construction, and the number of latrines in the cholera-affected areas increased. This increase undoubtedly contributed to the decrease in new cholera infections.

In addition to knowledge-enhancing trainings, there were also tangible items necessary to stop the epidemic, such as water purification tablets, soap, and supplies for constructing pit latrines. The sub-counties of Pallisa District where the outbreaks were centered were very rural and populated primarily by poor subsistence farmers residing in mud- or brick-walled and thatch- or tin-roofed huts. These huts were organized into small homesteads and villages. Latrine shortages were already rampant and clean water sources were far from ubiquitous. During our time in Pallisa, communities needed hand soap, water purification chlorine tablets, and concrete slabs for pit latrine surfaces in order for local interventions to be effective. These logistical and supply problems are not unusual in other resource-limited districts of Uganda.¹

The work of VHTs is challenging in itself and nearly impossible to complete if they do not possess the necessary supplies.

Following the assessment, Dr. Wamala met with the National Task Force on Cholera and Hepatitis E and recommended that VHT training be enhanced. He also recommended increasing the availability of the supplies mentioned above in an effort to improve community levels of sanitation and hygiene. By increasing the capability of VHTs to recognize suspected cases of cholera, in addition to affording them the materials necessary to prevent the spread of the disease, the chain of transmission could be stopped.

Ultimately, the eastern cholera epidemic came to an end in early fall 2008. After my departure, smaller epidemics arose in sections of Kampala and more recently, in the central district of Kayunga. As discussed previously, many causes contribute to an outbreak of cholera. Therefore, it is difficult to identify one factor in particular that leads to its resolution. The crux of the response is often found at the grassroots level. Education and sensitization efforts, proper case management and surveillance, the availability of adequate supplies, and maintaining local involvement all contributed to the halting of the epidemic. VHTs understand and respect the local culture. As a result, they are an integral aspect of all of these interventions.



Meeting with members of VHTs during response to the cholera outbreak in Pallisa District, eastern Uganda. (Standing in foreground: Dr. Joseph Wamala.)

Conclusion: VHTs and Community-Based Control of Communicable Diseases

While communicable disease outbreaks have long presented an ongoing challenge in the developing world, within recent years the frequency of such outbreaks has risen sharply. Among others, outbreaks of Ebola and Marburg fevers, cholera, meningococcal meningitis, bubonic plague, hepatitis E, and measles occurred during my collective time in Uganda.

In addition to the three pandemics of HIV/AIDS, tuberculosis, and malaria (which demand their own reviews and will not be covered here), other communicable diseases continue to take a devastating toll on those living in settings of poverty. Despite the unrelenting nature of such outbreaks, the good news is that many of these diseases are preventable. In situations where prevention fails, timely recognition and response can substantially decrease the mortality rates of epidemic-prone diseases. Early recognition of the signs and symptoms of the illnesses may help to prevent the negative social and economic consequences that accompany unrecognized outbreaks. As illustrated previously, VHTs and a community-based approach towards implementation of these practices is essential.

After Dr. Wamala and I visited the cholera-affected communities in eastern Uganda, it was clear that the creation and maintenance of adequate village-level surveillance systems was a key factor in ensuring that afflicted individuals were being recognized and initially treated by VHTs. Early detection of the illness by the villagers themselves enabled them to recommend that their neighbors seek care earlier. The epicenters of the outbreak were in remote corners of Pallisa District and were isolated from advanced health centers, and early identification and care were essential in providing symptomatic individuals enough time to reach a treatment unit before they became severely dehydrated. The early reporting of cases by VHTs to other health workers, along with the transportation of affected individuals to treatment centers, will most likely decrease the fatality rate of epidemics of cholera and similar diseases in remote areas.

To effectively contain outbreaks when prevention falls short, a support structure from the ground-up is needed to ensure that reports of “strange,” or suspected epidemic-prone diseases, are given timely attention and adequate resource allocation. Reports of what people refer to as “strange diseases” are not uncommon in Uganda. In many instances, reported cases of the diseases are promptly contained; sometimes they are actually determined to be unfounded.

There is, however, the possibility for an explosive and difficult-to-contain outbreak as seen in eastern Uganda. VHTs are usually the first to encounter reports of “strange” illnesses and have the power to notify those within the extended health care system or those at even higher levels of care. Well-trained and experienced VHTs possess the knowledge of warning signs and symptoms of various diseases. This should certainly be the case for diseases with hallmark indicators such as “rice-water” stool in cholera or a stiff neck in meningitis. Rapidly identifying these diseases can lead to enhanced containment measures and interventions.

As mentioned earlier, VHTs can also provide invaluable assistance during an outbreak by teaching outside investigators how to address local traditions and customs that may play a role in controlling the epidemic. An awareness and respect of local cultures works to gain the trust of the population. This trust is indispensable during contact tracing activities, one of the most important aspects of epidemic control.

It is important that VHTs are in positions to lead by example. If they cannot, it may prove impossible to relay health information to entire populations. As emphasized earlier, village teams can provide instruction on proper hand washing, appropriate sanitation, and hygiene promotion activities. Additional education on topics ranging from HIV/AIDS prevention to safe child-delivery and nutrition can be carried out by VHTs in their communities as well. The village doctors can provide local leadership and set ideal examples for their peers. VHT programs possess the unique ability to empower the impoverished and provide a bridge to health for the sick.



With community and VHT members (standing second from left: Mr. Luswa Lukwago).

Notes

¹ Innocent Komakech, “Village Health Team Strategy is a Most Innovative Community Practice Award Winner: the Experience of a Village Volunteer Programme in Yumbe District, Uganda,” Health Policy and Development 5.1 (2007): 21-27.

Works Cited

Komakech, Innocent. "Village Health Team Strategy is a Most Innovative Community Practice Award Winner: the Experience of a Village Volunteer Programme in Yumbe District, Uganda." Health Policy and Development 5.1 (2007): 21-27.
