

Lessons learned from past cholera epidemics, interventions which are needed today

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As the world is witnessing a continuous epidemic of cholera in Haiti in the new millennium, global concerns on this reemerging infection is on the rise.^[1] Although a downward trend in the fatality of this epidemic has been reported recently, the attack rate still remains high at 6.1%.^[2] It is of interest to know that before the recent earthquake, cholera was not seen in Haiti for more than a century and an independent panel convened by the United Nation (UN) concluded that the infection was brought back to Haiti by the United Nation (UN) stabilizing forces.^[3-5] Cholera epidemic is usually associated with poor quality of drinking water and other indicators of poor hygiene, which may also provoke epidemics of other infectious agents specially hepatitis A and E.^[6,7] Analyzing previous outbreaks of cholera may help to control these infections in Haiti more effectively and avoid similar tragedies. Continuity of this epidemic for a long period indicates that despite some optimistic views on rapid control, there is still failure in achieving control of this foreign-based epidemic in Haiti.^[2,8]

In 2005, Iran experienced an epidemic of cholera with more than 1100 registered cases.^[3] The epidemic started from a local area in central Iran near a vegetable farm. In that farm, a group of illegal immigrants from Pakistan who were suffering from diarrhea were living in tents. The original source of this epidemic was later confirmed with molecular studies.^[9-11] The first case was reported in the central city of Qom. The outbreak of watery diarrhea suspected to be cholera was rapidly noticed by the health workers in that village and reported to the local health authorities and then to the ministry. The initial response was local community awareness of the condition, information to health professionals, and strict control on food markets.

As the number of cases was increasing and the disease was found to affect many provinces, the ministry announced the epidemics nationally. In addition to the mentioned measures, a national propaganda on hazards of using fresh vegetables was broadcasted on television, radio, internet, magazines, and newspapers. Public awareness had a major impact in the control of this epidemic. In contrary to previous epidemics, which lasted longer,^[12] this epidemic was controlled within weeks and stopped after 4 months.

This epidemic once again emphasizes the importance of early detection and monitoring.^[13] The local health workers called "Behvarz" in Iran were the first to suspect the epidemics. The wide network of more than 30,000 of "Behvarzan" in Iran, who worked in more than 13,000 health houses during that time, gave the capacity of early detection of cases and later in monitoring in the progress of the epidemics.^[14] The importance of this capacity for diarrhea surveillance becomes more apparent when one notes that in the recent outbreak of *Escherichia coli* infection in Germany, the possibility of outbreak was only raised after 3 weeks from hospitalization of the first affected case.^[15,16]

Medicalization of this public health problem by medical professionals and focusing only on timely diagnosis and treatment of affected cases with antibiotics and hydration was another challenge. Although as a component of national surveillance system, all medical professionals are responsible to report all cases with watery diarrhea to local health authorities, not all of them did this on a timely manner. This was more important in the cities, where initially physicians considered cholera as a disease of rural regions and under estimated the expansible nature of this disease. Considering access of more than 98% of urban and 90% of rural population to sanitary water, it was true that those small communities who were mostly in remote rural areas were the most who were suffering from this outbreak. But the problem was not restricted to them. Even in urban cities with access to sanitary water, food processing at times was associated with use of unsafe water. Examples included ice producing factories, small businesses who prepared fresh vegetables for sale to the restaurants and markets, some of the gardens in vicinity to the cities, which were used for hosting large parties like wedding ceremonies. These places used at times well water, which contributed to the continuation of the epidemic.^[17] Another challenge was those small vegetable farms near the major metropolitans, which were irrigated with waste water or who used natural fertilizers. The control of the outbreak became possible when all of these neglected and hidden routes of transmission of the infection were approached. These interventions were possible though an intersectorial collaboration with special help from ministries of interior, water and energy, and agriculture and even nongovernmental organizations

Another issue, which needs consideration, is the rate of consumption of fresh vegetables and fruits in Iran. Before this epidemic, health survey in Iran shows that this rate was around 93%. Just the year after the epidemic, it dropped to 87% and even 4 years after this outbreak it only rose to 88%. Current evidence indicates that low vegetable consumption is associated with obesity, diabetes and higher risk of cardiovascular diseases and increased rate of some cancers. As eating fresh vegetables are among the most effective measures in controlling noncommunicable diseases (NCDs), this event may have a drawback in the current pandemic of NCDs. This means, informing the population about the route of transmission of infectious diarrheal diseases; empowerment to control should also be popularized to avoid this type of misconceptions with resultant increase in NCDs risk factors.

In conclusion, control of epidemics like cholera is a multidimensional program. Simplistic approach for these complex problems may even increase the harms and hazards without any benefit. As the epidemic of cholera has not been stopped in Haiti even after 2 years of global effort, health authorities should reevaluate their efforts to find where other facets of this vicious cycle were not approached systematically.

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