

ACUTE WATERY DIARRHEA and CHOLERA

Pre-decision Brief for Public Health Action

Haiti ■ Feb 2010

Key Recommendations

- The most effective measures to prevent transmission of acute watery diarrhea are provision of safe (chlorinated) water; safe water storage; appropriate disposal of feces; and handwashing with soap after caring for patients, toileting, cleaning other persons after toileting, or before preparing, serving, or eating food. Because onset of the rainy season is likely to enhance transmission of acute watery diarrhea, these measures should be strengthened immediately, particularly in settlements for displaced persons.
- Outbreaks of acute watery diarrhea are likely to occur. Surveillance systems should be able to rapidly detect an increase in reported cases of acute watery diarrhea. Such an increase should trigger efforts to determine the source of transmission, ensure implementation of control measures in the affected area, and determine the microbial etiology.
- Dehydration is the critical clinical issue. Adequate supplies for oral and intravenous rehydration and training in clinical management of dehydration need to be in place throughout the affected regions before an outbreak occurs.
- Cholera is extremely unlikely to occur. However, if adults present with acute watery diarrhea and severe dehydration, cholera testing should be performed.

1. What was the situation in Haiti prior to the earthquake?

- National surveillance data for acute watery diarrhea in Haiti were not previously available. Studies in Haiti have suggested that diarrhea is a common illness (approximately 4–6 episodes of diarrhea per child per year) and cause of death (5–16% of deaths) among children.^{1,2,3,4} Estimated diarrhea incidence in Haiti is several times higher than the expected annual incidence among young children in industrialized countries.
- There have been no reports of cholera in Haiti since 1960 or earlier. Cholera is absent from the Caribbean.
- The National Public Health Laboratory (LNSP) was not routinely performing diagnostic tests for watery diarrhea before the earthquake

2. What is the likelihood of cases/outbreaks of acute watery diarrhea developing in the near future?

- Outbreaks of acute watery diarrhea are very likely to occur in the near future. More than 20,000 cases of acute watery diarrhea were reported after an earthquake in Pakistan in 2005,⁵ and there are many reported outbreaks of watery diarrhea following disasters involving flooding or in encampments for displaced persons.^{6,7,8} Transmission of acute watery diarrhea occurs through consumption of sewage-contaminated water or food, contact with contaminated environmental surfaces, or direct person-to-person spread in conditions of poor hygiene. All of these routes of transmission exist in post-earthquake Haiti. Current problems with water, sanitation, and hygiene infrastructure will be exacerbated during the rainy season, when contact with contaminated standing water and sewage run-off will be common.



- An outbreak of cholera is very unlikely at this time. For a cholera outbreak to occur, two conditions must be met: (1) there must be significant breaches in the water, sanitation, and hygiene infrastructure used by groups of people, permitting large-scale exposure to food or water contaminated with *Vibrio cholera* organisms; and (2) cholera must be present in the population. While the current water, sanitation, and hygiene infrastructure in Haiti would certainly facilitate transmission of cholera (and many other illnesses), cholera is not circulating in Haiti, and the risk of cholera introduction to Haiti is low. Most current travelers to Haiti are relief workers from countries without endemic cholera, and they are likely to have access to adequate sanitation and hygiene facilities within Haiti, such that any cholera organisms they import would be safely contained. Similarly, importation of cholera through contaminated food has not been documented in Haiti in decades and is unlikely to become a problem during the relief efforts.

3. Should an outbreak occur, how would it be detected?

- The Health Cluster has established sentinel site surveillance for acute watery diarrhea throughout Haiti. An outbreak of acute watery diarrhea would be suggested by a rapid increase in the number of persons with three or more loose, non-bloody stools in a 24-hour period.
- The most likely etiologies of watery diarrhea in Haiti would be norovirus, rotavirus, enterotoxigenic *Escherichia coli*, *Giardia*, and cryptosporidia, which cause clinically indistinguishable disease at presentation. Cholera testing should be performed if adults present with acute watery diarrhea and severe dehydration.
- Should an outbreak be detected, stool specimens should be collected from a limited number of cases (10–20) and tested in the LNSP or, if needed, in another reference lab. Microscopy and culture should be performed to determine etiology. Rotavirus, *Cryptosporidium*, and *Giardia* typically cause more severe disease in children than in adults; enzyme immunoassays for these agents would be useful if outbreaks are seen primarily among children. Rapid diagnostic tests for cholera are sensitive and specific for outbreak detection; cholera rapid tests are now available at the LNSP.

4. What options for public health action should be considered in the event of an outbreak?

- Chlorination of piped and tankered water supplies and/or point-of-use water treatment and safe water storage, and access to improved sanitation facilities, handwashing stations, and soap are the most important outbreak mitigation strategies. These should be strengthened before onset of the rainy season, particularly in settlements for displaced persons. During an outbreak of cryptosporidiosis or giardiasis, boiling of water is preferred; chlorination is marginally effective against *Giardia* and is not effective against *Cryptosporidium*.
- Dehydration is the critical clinical issue for all types of acute watery diarrhea. The cornerstone of treatment is prompt provision of adequate low-osmolarity oral rehydration and/or isotonic intravenous solutions. Because death due to dehydration from watery diarrhea can occur within hours, hydration supplies and clinician training on hydration management should be in place before an outbreak occurs.
- Because most episodes of watery diarrhea are self-limited, antibiotics are primarily used to treat patients with clinical sepsis. However, during an outbreak of giardiasis, metronidazole could be used to limit transmission.
- For children with acute watery diarrhea, continued breastfeeding, nutritional support, and supplemental zinc (20 mg/day by mouth for 10–14 days for children 6–59 months of age; 10 mg/day by mouth for 10–14 days for infants younger than 6 months of age) can decrease duration and severity of diarrheal illness.
- While not generally used to mitigate outbreaks, cholera and rotavirus vaccines are commercially available and could be considered in the event of a confirmed outbreak. Vaccines are not available for other agents of watery diarrhea.

References

1. Bowen, A., and Seema Jain (2005). Epi-Aid #2005-009 Trip Report: Assessment of Post-Hurricane Jeanne Disease Surveillance and Emergency PuR Distribution-Gonaives, Haiti, 2004. Atlanta, GA, CDC.
2. Cayemittes, M., Marie Florence Placide, Soumaïla Mariko, Bernard Barrère, Blaise Sévère, Canez Alexandre. (2007). *Enquête Mortalité, Morbidité et Utilisation des Services, Haïti, 2005-2006*. Calverton, Maryland, USA, Ministère de la Santé Publique et de la Population, Institut Haïtien de l'Enfance et Macro International Inc.
3. WHO (2006). Haiti: Mortality Country Fact Sheet 2006. Geneva, Switzerland, WHO.
4. PAHO. "Haiti: Health Situation Analysis and Trends Summary." Retrieved February 5, 2010, from http://www.paho.org/English/DD/AIS/cp_332.htm.
5. Ligon, B. L. (2006). "Infectious diseases that pose specific challenges after natural disasters: a review." *Semin Pediatr Infect Dis* 17(1): 36-45.
6. Mach O, Lu L, Creek T, Bowen A, Arvelo W, Smit M, Masunge J, Brennan M, Handzel T. (2009). "Population-based study of a widespread outbreak of diarrhea associated with increased mortality and malnutrition in Botswana, January-March, 2006." *Am J Trop Med Hyg* 80(5):812-8.
7. Watson, J. T., M. Gayer, et al. (2007). "Epidemics after natural disasters." *Emerg Infect Dis* 13(1): 1-5.
8. Yee E, Palacio H, Atmar R, et al. (2007). "Widespread outbreak of norovirus gastroenteritis among evacuees of Hurricane Katrina living in a 'megashelter' in Houston, Texas: lessons learned for prevention." *Clin Infect Dis* 44:1032 - 9.

