

## WATERBORNE DISEASE OUTBREAKS

### REPORTING INFORMATION

- **Class C:** Report by the end of the next business day to the local health department in whose jurisdiction the outbreak has occurred when an outbreak is suspected (see **Case Definition** below for the definition of a waterborne disease outbreak) unless the unexpected pattern of cases, suspect cases, deaths, or increased incidence of disease is of major public health concern pursuant to paragraph (A) of rule 3701-3-02 of the Ohio Administrative Code (OAC), then such reports shall be made according to paragraph (A) of this rule.
- Report to the local health department (LHD) in whose jurisdiction the outbreak occurred. The LHD must then report to the Ohio Department of Health (ODH) Outbreak Response and Bioterrorism Investigation Team (ORBIT) at 614-995-5599.
- The LHD is required to report all suspected waterborne disease outbreaks through the Ohio Disease Reporting System (ODRS) outbreak module. If individual cases are entered into ODRS, important fields include "Drinking Water Source" (if this is the suspected source of exposure), the "Travel and Other Exposure" section, "Symptoms", and all other epidemiological exposure and lab confirmation data.
- The LHD is required to report all waterborne disease outbreaks through the National Outbreak Reporting System (NORS).
- Reporting Form (s) and/or Mechanism: One of the following four documents will be required for the investigation of a Waterborne Outbreak in NORS. This is dependent upon the type of water involved in the outbreak:
  - Recreational Water – Treated (CDC 52.12 Rec\_Treated)
  - Recreational Water – Untreated (CDC 52.12 Rec\_Untreated)
  - Water Intended for Drinking (CDC 52.12 WID)
  - Water Not Intended for Drinking or Water of Unknown Intent (CDC 52.12 WNID\_WUI).
- The Ohio Enteric Case Investigation Form (<http://www.odh.ohio.gov/pdf/IDCM/fdbrnecr.pdf>) is not required but might be useful in follow-up of individual cases. Do not send this report to ODH. It is for LHD use only.
- There are several additional forms to be completed or available to assist with investigation depending on the organism(s) and setting involved or suspected. Please see the complete list of forms in the section Special Information under **Public Health Management** below.

### AGENT

Waterborne disease outbreaks are caused by many different microorganisms. In the United States, they include agents that cause enteric, skin and respiratory diseases. Enteric agents are most commonly associated with waterborne disease outbreaks, and include *Cryptosporidium* sp., *E. coli* O157:H7, *Giardia*, *Shigella*, Hepatitis A Virus and *Norovirus*. Agents causing skin infections include pseudomonas and schistosomes. Respiratory agents include Legionella. This list is not exhaustive. The vast majority of waterborne disease outbreaks have undetermined etiology. If the causative agent identified is reportable as an individual listing under the OAC (e.g. Hepatitis A, *Shigella*), the case(s) should be reported as the specific disease.

Note: Harmful Algal Blooms (HABs) have also been identified as sources of illness among persons and animals exposed to untreated recreational water. For the years 2009-2010, 11 HAB-associated outbreaks in the U.S. were reported to CDC's Waterborne Disease and Outbreak Surveillance System (WBDOSS) via NORS. Six of these HAB-associated outbreaks were in Ohio. If HAB outbreaks are identified, the LHD should notify the ODH Bureau of Environmental Health Site Assessment Section and ORBIT for assistance.

## **CASE DEFINITION**

The Waterborne disease outbreak system collects data on both outbreaks and individual cases of waterborne disease. Waterborne outbreaks are divided into categories depending on the type of water, the setting and the regulatory jurisdiction.

### **Drinking water, water not intended for drinking (excluding recreational water), and water of unknown intent:**

Two criteria must be met for an event to be defined as a waterborne-disease outbreak (WBDO) associated with drinking water, water not intended for drinking (excluding recreational water), or water of unknown intent. First, two or more persons must be epidemiologically linked by location of exposure to water, and by time, and characteristics of illness. Second, the epidemiologic evidence must implicate water as the probable source of illness.

In addition to WBDOs, single cases of laboratory-confirmed primary amebic meningoencephalitis (PAM) as a result of *Naegleria fowleri* infection with a known water exposure and single cases of chemical/toxin poisoning, if water-quality data indicate contamination by the chemical/toxin, are also reported in the WBD OSS. All single cases are discussed separately from WBDOs. Single cases of legionellosis are reported elsewhere.

Reported outbreaks associated with contaminated drinking water; commercially bottled water, ice, or beverages made with contaminated water; and water contaminated by malfunctions in equipment/devices in which water is used or distributed (e.g. beverages contaminated by plumbing failures in drink mix/soda machines) are classified as WBDOs. Tabulation of WBDOs is based on location of water exposure, not on state of residence of the ill persons. WBDOs associated with cruise ships are not summarized in this report.

WBDOs associated with commercially bottled water are classified separately from the water systems described in this *Surveillance Summary*. Separating piped from non-piped water distinguishes between drinking water systems regulated by EPA (community and non-community) and the Food and Drug Administration (FDA) (bottled).

### **The most recent data available for drinking water and other non-recreational water can be found here:**

[http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6235a3.htm?s\\_cid=mm6235a3\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6235a3.htm?s_cid=mm6235a3_w)

### **Recreational water:**

To be defined as a WBDO associated with recreational water, an event must meet two criteria. First, two or more persons must be epidemiologically linked by the location of the exposure to recreational water, time, and illness. Recreational water settings include swimming pools, wading pools, spas, waterslides, interactive fountains, wet decks, and fresh and marine bodies of water. Second, the epidemiologic evidence must implicate water or volatilization of water-associated compounds into the air surrounding an aquatic facility as the probable source of the illness. For this report, WBDOs are separated by venue as untreated (i.e. fresh and marine surface water) or treated (i.e. filtered or disinfected [e.g. chlorinated]) water. WBDOs associated with ships are not included.

This report also includes 1) individual cases of laboratory-confirmed PAM associated with recreational water use, 2) single cases of wound infections or other *Vibrio*

infections associated with recreational water use, 3) single cases of chemical and toxin poisoning if water or air-quality data indicate contamination by the chemical or toxin, and 4) outbreaks or case reports of health events associated with aquatic facilities but not associated with the recreational water but rather contaminated aquatic facility air (e.g. mixing of chemicals in the pump room might release toxic gas that injures staff or facility users). Because these four event categories do not meet WBDO definition, they are analyzed separately from WBDOs.

Note: Previously, the definition of a recreational waterborne disease outbreak included certain single cases of waterborne disease. The definition of a recreational waterborne-disease outbreak has been clarified to include two or more persons who have been epidemiologically linked to recreational water by location of exposure, time, and illness. Exposures include contact with or accidental ingestion of water and certain inhalation exposures (e.g. exposure to water-associated compounds [e.g. chloramines] volatilizing into the air of the aquatic facility). Single cases of PAM, recreational water-associated *Vibrio* illness, and illness related to chemical exposure caused by water are included in WBDOSS but are not classified or analyzed as outbreaks. These single cases are analyzed separately.

**The most recent data available for recreational water can be found here:**

[http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6301a2.htm?s\\_cid=mm6301a2\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6301a2.htm?s_cid=mm6301a2_w)

## **SIGNS AND SYMPTOMS**

Symptoms, incubation and duration vary greatly in type and severity, depending on the agent and dose.

## **DIAGNOSIS**

If the symptoms are enteric: stool specimens should be collected from as many symptomatic persons as possible and sent to the ODH Laboratory (ODHL). Depending upon the suspected organism, C & S transport medium and/or parasite kits will be used for transport of the specimens. Testing for Norovirus (Norwalk Virus) requires the collection of bulk stool specimens (see file named foodbrn.doc).

The only waterborne parasite for which ODHL provides testing is *Cryptosporidium*.

If symptoms are respiratory (e.g. *Legionella*), please refer to the legionellosis section of the Infectious Disease Control Manual.

If symptoms are of other types e.g. skin infections (pseudomonas) or systemic infections, please call ORBIT at 614-995-5599 for assistance.

If water samples are to be collected, special arrangements must be made in advance by contacting ORBIT at 614 995-5599. ORBIT will work with the Bureau of Environmental Health or CDC to arrange for testing in outbreak situations.

ODHL does not test water samples for specific organisms.

Fee exemption for testing stool specimens at ODHL can be requested by contacting ODH ORBIT at 614-995-5599.

## **EPIDEMIOLOGY**

### **Source**

Water whether intended for consumption, or not, which has been contaminated with a disease causing agent. Reported outbreaks in the United States have been associated with surface waters (e.g. lakes, streams, rivers), well water, spring water, recreational and other aquatic facility waters, bottled water and less frequently with water from municipal treatment plants.

### **Occurrence**

The majority of outbreaks occur from June through October. One hundred six outbreaks were reported in the United States during 2005-2006 the most recent years reports are available. Of these 78 were associated with recreational or other aquatic facility venues. Waterborne outbreaks are rarely reported in Ohio.

### **Mode of Transmission**

Ingestion or contact with contaminated water.

### **Period of Communicability and Carrier State**

Waterborne disease may be communicable and carrier states can exist, depending upon the agent. For *Norovirus*, no carrier state has been documented; the period of communicability is believed to be from onset of symptoms to at least 48 hours after recovery. For information on other agents (e.g. *Giardia*, *Shigella*, Hepatitis A Virus), refer to the respective sections in this manual.

## **PUBLIC HEALTH MANAGEMENT**

Waterborne disease outbreaks should be investigated to uncover the source of infection so that interventions can be instituted and further cases prevented. Three excellent resources for conducting waterborne investigations are:

For the general NORS waterborne outbreak form:

[http://www.cdc.gov/nors/pdf/NORS\\_CDC\\_5212-form.pdf](http://www.cdc.gov/nors/pdf/NORS_CDC_5212-form.pdf)

For the recreational water toolkit:

[http://www.cdc.gov/healthyswimming/rwi\\_outbreak.htm](http://www.cdc.gov/healthyswimming/rwi_outbreak.htm)

For the drinking water toolkit:

<http://www.cdc.gov/healthywater/emergency/toolkit/drinking-water-outbreak-toolkit.html>

In addition to testing of biological samples, the following are important:

- Histories of symptoms and exposures (including exposure to water) should be obtained for cases and compared to those of non-cases or non-ill persons.
- The source of the water should be investigated to determine treated/filtered status, repair/damage to sewer lines.

Based upon water analyses and/or epidemiologic and clinical findings, advise persons using the water source about methods to eliminate further exposure to the water or disinfection of the source.