

Committee: Infectious Disease

Title: Improving Detection, Investigation, and Reporting of Waterborne Disease Outbreaks

Statement of the Problem:

The national Waterborne Disease and Outbreak Surveillance System (WBDOS) has been in existence since 1971 and collects reports on the occurrence and characteristics of Waterborne Diseases and Outbreaks (WBDOs) associated with drinking water, recreational water, and water not intended for drinking or recreational use from local and state/territorial health departments throughout the United States.^{1,2} WBDOS is maintained through the collaborative efforts of the Council of State and Territorial Epidemiologists (CSTE), the U.S. Environmental Protection Agency (EPA), and the U.S. Centers for Disease Control and Prevention (CDC). Data collected by WBDOS are used at the local, state, and federal levels to inform the public health community and to develop regulatory rules and policy that ensures water safety in the United States. For example, EPA regularly uses WBDOS data to develop and support water regulatory policy. Although outbreaks are generally investigated by health departments, WBDOs may go undetected or unreported to WBDOS; potentially causing an underestimation of the impact of WBDOs on our communities. Under-detection may be due to varying local skills and lack of resources in investigating WBDOs, while under-reporting may be due to a lack of awareness of the WBDOS. Hence, developing training for investigation of WBDOs, creating investigation and surveillance guidelines, and making WBDOs—as a unit of reporting—nationally notifiable should improve detection and reporting of WBDOs, and increase the awareness and usefulness of WBDOS at the local and state/territorial level.

Statement of the desired action(s) to be taken:

CSTE recommends that:

1. CDC and EPA work with CSTE to develop training for WBDO investigation targeted at local and state/territorial public and environmental health workers responsible for WBDO detection, investigation, and reporting.
2. CDC and EPA work with CSTE to develop national WBDO investigation and surveillance guidelines.
3. Starting in 2007, make Waterborne Disease Outbreaks—as a unit of reporting—nationally notifiable and reportable to CDC via the existing WBDOS (using CDC form 52.12) (see below in *Methods for Surveillance* section).
4. All states, territories, and/or localities add Waterborne Disease Outbreaks to their notifiable disease list.

Goals of WBDOS:

1. Improve investigations of WBDOs, including identification of etiologic agents that cause WBDOs and determination of the underlying factors that cause disease and outbreaks to occur.
2. Foster collaboration and communication—at the local, territorial, state, and federal level—among different agencies/entities that may have separate responsibilities for the investigation, regulation, and/or reporting of WBDOs.
3. Improve reporting and characterization of the epidemiology of WBDOs and describe more accurately the burden of WBDOs for communities in the United States.
4. Improve the use of surveillance system data for tracking trends and outcomes of WBDOs over time.

Methods for Surveillance:

Public health departments from localities and states/territories have the primary responsibility for detecting, investigating, and reporting WBDOs to WBD OSS, a system managed by the CDC, Division of Parasitic Diseases. Selected information collected by public health departments during the course of WBDO investigations will be reported to WBD OSS using a standard report form (CDC form 52.12, available at http://www.cdc.gov/healthyswimming/downloads/cdc_5212_waterborne.pdf).

CDC form 52.12 solicits data on characteristics of the outbreak, including person, place, time, and location information; results from epidemiologic studies conducted; clinical specimen and water sample testing; and other factors potentially contributing to the outbreak (e.g., environmental concerns, disinfection, and filtration). CDC annually requests reports from local, territorial, and state epidemiologists or persons designated as WBDO surveillance coordinators.

Outbreak Definition:^{1,2}

The following two criteria must be fulfilled for designation of a WBDO:

1. Two or more persons must have experienced a similar illness after exposure to water.
 - This criterion is waived for a single case of laboratory-confirmed primary amebic meningoencephalitis (PAM), or for a single case of recreational water-associated wound infection (e.g., *Vibrio*), or for a single case of chemical/toxin poisoning if water-quality data indicates contamination by the chemical/toxin.
2. Epidemiologic evidence must implicate recreational water, recreational water settings, drinking water, or other types of water or water-related settings (e.g., non-potable water, showers, storage tanks, etc.) as the probable source of the illness.^{1,2} Reported cases and outbreaks associated with drinking water or ice contaminated at the point of use (e.g., a contaminated water faucet or serving container) are classified as WBDOs. Outbreaks associated with cruise ships will not be captured by this surveillance system.

Period of Surveillance:

Continuous surveillance. No end date.

Background and Justification:

WBDOs occur infrequently,³ but have the capacity to cause a great deal of morbidity and mortality when they occur.³ WBDO surveillance is an important activity that allows health departments to detect and respond to outbreaks, and identify areas where preventive measures can be most effective. However, as with most surveillance systems, it is generally accepted that WBDO surveillance is incomplete, and estimates suggest that 67-90% of WBDOs go undetected or unreported.⁴ Although most states (~90%) require all “outbreaks” to be reported in their reportable disease list, many (~68%) do not include any specific reference to waterborne outbreaks or waterborne disease.⁵ The lack of uniformity in WBDO detection, investigation, and reporting demonstrates a great need for increased training targeted at local and state/territorial health department investigators, and national guidelines that outline investigation methodology and surveillance requirements. Under-detection and under-reporting affects the sensitivity of local, state/territorial, and national surveillance systems, and diminishes the capability of public health officials to make informed decisions in response to the estimated impact of WBDOs on our communities.

WBD OSS is a voluntary paper-based system that tracks outbreaks due to exposure from drinking water systems, recreational-water venues, and other water sources. This surveillance system is unique because it collects reports on the occurrences and characteristics of outbreaks—as the unit of reporting—rather than individual cases. However, individual cases of waterborne disease are also reported to WBD OSS if water is known to be the source of illness (see Outbreak Definition for these exceptions). Health departments are responsible for the detection and investigation of WBDOs, and reporting them to WBD OSS. Although encouraged to report investigation

results as they occur, state and territorial health departments are solicited each September by CDC to submit information regarding all WBDOs for that year. The information transmitted to WBDOS is then used to assess trends at the state and national level and findings are published biennially in the CDC-Morbidity and Mortality Weekly Report (MMWR) Surveillance Summaries. Presently, plans are underway to add electronic reporting of WBDOs through the CDC eFORS (electronic Foodborne Outbreak Reporting System).

Experience indicates that enhancing existing WBDO surveillance systems improves the detection and reporting of WBDOs.^{6,7} Providing WBDO-specific investigative training and strengthening communication between different health department strata (*i.e.*, state-local, epidemiology-environmental health) and among the various agencies responsible for investigation and reporting has been shown to increase the number of outbreaks recognized and investigated.⁷ Although implementing such activities is likely to improve surveillance at the local and state/territorial level, national guidelines that could be used to model training programs and provide the basis for uniform reporting do not yet exist, and CDC has noted several occasions where WBDOs were not reported to WBDOS. These deficits are concerning as non-uniform reporting to WBDOS can affect state/territorial and national estimates for the burden of WBDOs and obscure important trends that can motivate critical preventive measures. To address these concerns, the development of national guidelines will provide the framework through which WBDO-specific investigative training and improved communication networks can be developed. In addition, enhancing local surveillance and making WBDOs nationally reportable should increase the awareness of WBDOS—and its reporting requirements—among local and state/territorial health departments, and improve reporting to this system.

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