

Guide to Surveillance, Reporting and Control

(on-line edition)

A publication of the Massachusetts Department of Public Health, Bureau of Infectious Disease

Comments, questions, and suggestions regarding this reference manual are welcomed.
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Introduction

Purpose of the *Guide to Surveillance, Reporting and Control*

Infectious diseases are a continuing threat to the public's health. They cause illness, suffering, and death, and they place an enormous financial burden on society. Although some infectious diseases have been controlled by modern advances, diseases are constantly emerging or re-emerging. State public health officials rely on local boards of health (LBOH), health care providers, laboratories, and other public health personnel to report the occurrence of reportable diseases. Without such data, trends cannot be accurately monitored, unusual occurrences of diseases (such as outbreaks) cannot be detected and appropriately addressed, and the effectiveness of control and prevention activities cannot be easily evaluated.

The Massachusetts Department of Public Health (MDPH), Bureau of Infectious Disease (BID) places strong emphasis on improving infectious disease surveillance and response. This reference manual is part of the MDPH focus on providing more training and technical assistance to local health. The purpose of this manual is to guide LBOHs through specific surveillance and reporting, and case investigation responsibilities for the diseases currently reportable to the MDPH.

This manual is comprised of individual chapters for each reportable disease. The chapters are arranged alphabetically. While this manual is targeted to LBOH and health department personnel, other health care professionals can also use the information to enhance their understanding of local public health surveillance and reporting responsibilities, and how they can collaborate and play a role in strengthening timely and complete reporting.

Organization of the MDPH Bureau of Infectious Disease

The MDPH BID is comprised of the Division of Epidemiology and Immunization, the Division of Global Populations and Infectious Disease Prevention, the Division of Sexually Transmitted Infection Prevention and HIV Surveillance, the Office of HIV/AIDS, the Office of Research and Evaluation, and the Office of Integrated Surveillance and Informatics Services (ISIS). The Division of Epidemiology and Immunization is further subdivided into the Epidemiology Program and the Immunization Program. Bureau staff are located at the MDPH William A. Hinton State Laboratory Institute (HSLI) in Jamaica Plain, the MDPH main office at 250 Washington Street, Boston Massachusetts, and in six regional offices around the state.

The Massachusetts Reportable Disease Surveillance System

What is Surveillance?

Disease surveillance is the regular collection, monitoring, and analysis of data relevant for disease control and prevention. The data may be used to define baseline levels of disease. By knowing the baseline, one may identify unusual occurrences of disease. Ultimately, the purposes of infectious disease surveillance are: 1) to use information to help interrupt transmission of infections; and 2) to reduce morbidity and mortality through:

- Timely reporting,

- Identification and investigation of outbreaks,
- Interpretation of investigative data and dissemination of findings, and
- Informing planning and policy development.

The Office of Integrated Surveillance and Informatics Services (ISIS) was formed in 2004 to streamline and enhance surveillance and informatics activities among the divisions and programs within the BID.

In general, ISIS is responsible for the following activities:

- Managing new and existing surveillance and informatics initiatives;
- Providing a single point of contact for external reporting sources including local public health agencies, laboratories, hospitals, and providers;
- Coordinating data exchange and managing surveillance data collection efforts;
- Developing and implementing standards for data collection and electronic data exchange;
- Evaluating surveillance and data systems and relevant protocols:
- Providing oversight related to confidentiality, privacy, HIPAA, and legal and freedom of information requests; and
- Overseeing and revising Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements (*105 CMR 300.000*).

Surveillance can be categorized as “active surveillance” and “passive surveillance.” Traditional reporting of diseases by health care providers and laboratories is considered passive surveillance; the recipient of the information waits for initial data on a case to be submitted. This usually leads to follow-up activities to collect additional information. A LBOH receiving a report of invasive *Neisseria meningitidis* infection from a health care provider or facility is an example of passive surveillance.

A sub-category of passive surveillance is “enhanced passive surveillance,” in which the organization receiving data works closely with health care providers and laboratories that are most likely to report a particular disease or group of diseases, and sets up systems to increase timeliness and completeness of reporting. Enhanced passive surveillance often requires phone calls and other follow-up activities with reporting sources and involves more work than traditional passive surveillance.

In active surveillance, the organization receiving information takes *direct* action in case finding and collecting information. This may occur through direct review of medical records, laboratory records, or screening of high-risk populations. An example of active surveillance is the situation in which observation of an unusual condition, such as a potential complication of healthcare, leads to a question of isolated occurrence versus a part of an outbreak. The health department contacts healthcare facilities for

information about the presence of other cases and reviews these other cases to rule a cluster of cases in or out.

Legal Basis

In Massachusetts, reporting of communicable and infectious diseases is required under Massachusetts General Laws, Chapter 111, Sections 3, 6, 7, 109, 110, 111 and 112, and Chapter 111D, Section 6. These laws are implemented by regulation under Chapter 105, Code of Massachusetts Regulations (CMR), Section 300 *et seq*: *Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements*. The purpose of these regulations is “to list those diseases declared dangerous by the Massachusetts Department of Public Health, and to establish reporting, isolation and quarantine requirements. This is intended for use by local boards of health, hospitals, clinicians, educational and recreational program health officials, food industry officials, and the public.” These regulations are updated on a regular basis.

Clinicians must report infectious diseases designated as dangerous to the public health directly to the LBOH of the city or town in which the diagnosis is made. The only exceptions to this are sexually transmitted infections, tuberculosis, and HIV/AIDS, which are reported directly to the MDPH. LBOH or their designees are authorized to accept, investigate, and submit reportable disease case information to the BID. Laboratories performing examinations on any specimens derived from Massachusetts residents that yield evidence of infection due to certain organisms must report directly the MDPH.

Note: Specific information about what to report and when and where to report it is provided in each individual chapter.

Summary information on nationally notifiable diseases is submitted to the CDC on a weekly basis (without personal identifiers). This information is used to track national and regional disease trends. The current lists of diseases reportable to the BID and to LBOH (by health care providers and by laboratories) can be obtained on the MDPH website (<http://www.mass.gov/eohhs/docs/dph/cdc/reporting/rdiq-reg-summary.pdf>) or by calling ISIS at (617) 983-6801.

Case Investigation and Control: State versus Local Role

The MDPH BID collaborates with LBOH in the investigation of communicable disease cases and in the implementation of appropriate control and prevention measures. The guidelines in this manual, as well as in other referenced material, form the basis for LBOH communicable disease reporting, investigation, and control. For most infectious diseases the LBOH takes the primary role in investigating individual cases. Note that the MDPH has “coordinate powers” with LBOH and may initiate an investigation. When a LBOH is unavailable, the MDPH may receive reports directly from health care providers.

When clusters of illness, potential bioterrorist agents, emerging infections, or other serious threats to public health are identified, the MDPH will provide technical assistance to LBOH. This assistance will range from serving in a consulting capacity to direct management of the investigation, implementation of control and prevention measures, and follow-up activities. In some situations, the MDPH may request federal technical assistance from the CDC.

Note: Requests for federal technical assistance must be made by the MDPH.

When an institution, such as a health care facility or a school, is the site of possible transmission of infection, the infection control staff of the facility or the school nurse typically is actively involved in the investigation and in the application of control and prevention measures. Decisions about varying the control measures are normally made collectively by the MDPH, the LBOH, and the infection control staff (or equivalent) in the affected institution. However, the MDPH and the LBOH, working together, have ultimate authority.

Timeliness of Reporting

Case information on reportable infectious diseases is reported to ISIS by the LBOH through MAVEN, the Massachusetts Virtual Epidemiologic Network. (The exceptions are the diseases that are reported directly to MDPH by health care providers.) Certain diseases should be immediately reported by phone to the MDPH Division of Epidemiology and Immunization, at (617) 983-6800 or (888) 658-2850, when a suspect or confirmed case is identified. See each disease chapter for details.

Diseases that require immediate reporting and response should always be prioritized above other case investigations. In addition, any disease that involves a cluster or a suspected foodborne outbreak should also be reported immediately to the MDPH Division of Epidemiology and Immunization, by phone at (617) 983-6800 or (888) 658-2850, and should be prioritized accordingly. Information can then later be included in MAVEN or, for non-MAVEN users, through an official paper case report form to ISIS. All diseases that are not categorized as “immediate” should be reported and investigated in a timely manner, with information completed in MAVEN.

Note: Reports of illness received for residents of other cities/towns should be forwarded either to the LBOH of that city/town or to ISIS (which will notify the appropriate LBOH).

Timeliness of reporting is important. Failure to report in a timely manner can have dire consequences. For example, if a local health authority retains its reports of *Salmonella* infection and only submits them periodically, a potential outbreak occurring across city/town limits may go unnoted and uncontrolled.

Note: Specific information about what to report and when and where to report it is provided in each individual chapter.

The MDPH Division of Epidemiology and Immunization has an epidemiologist on-call during normal business hours at (617) 983-6800 or (888) 658-2850 to answer questions about *case investigation and control measures*. ISIS is available during normal business hours at (617) 983-6801 for questions about *reporting requirements*. An epidemiologist is also available via beeper during non-work hours and weekends for emergency situations (e.g., if you receive several complaints and are concerned about a potential foodborne illness outbreak or if you suspect a bioterrorist incident) at (617) 983-6800 or (888) 658-2850. All calls are returned promptly.

Some examples of top priorities for reporting and follow-up include:

- Clusters of illness;

- Diseases that require prompt administration of agents to prevent further spread and/or to reduce morbidity and mortality (e.g., rabies, hepatitis A, pertussis, or meningococcal infection);
- Diseases with high mortality rates (e.g., eastern equine encephalitis);
- Suspect bioterrorist agents (e.g., anthrax or smallpox);
- Disease that is unusual in the infected individual’s demographic group or geographic region; or
- Enteric illness in a food handler or a household contact of a food handler.

Note: To help LBOH distinguish diseases that pose a more serious public health threat, certain chapters have been flagged. These disease chapters have a box with the notation “Report Immediately” at the top of the first page. Immediate reports are usually made by phone, by calling the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850. You may also contact the Division if you are unsure about which investigations to do first or if you need technical assistance.

Reporting by Clinicians

Throughout the Commonwealth, reporting of diseases by clinicians is improving but remains inconsistent. Clinicians are more likely to report diseases with high mortality or diseases spotlighted in local and national media. Some strategies to increase reporting by clinicians include: focused education on the importance of reporting and appropriate mechanisms for reporting; identification of professional or support staff who work with clinicians and who are able to take on the responsibility for reporting of clinician-diagnosed reportable disease; and prioritization of reportable diseases that pose a more serious risk to public health.

Note: LBOH having difficulty obtaining information from clinicians should contact the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850 for assistance. Also, sample letters outlining the roles and responsibilities of the LBOH for use with health care providers and patients are available from the MDPH Division of Epidemiology and Immunization and under the Help section in MAVEN..

Health care providers do not always inform patients that a disease is reportable to local or state health departments. This may lead to distress for a patient who is contacted for a case investigation. Health care provider education on this issue is a good strategy for LBOHs. In addition, LBOHs should know when test results and diagnoses are communicated to a patient. For diseases that do not require immediate attention and for which the risk of transmission to others is minimal or nonexistent, a clinician may wait for a patient’s next visit before discussing the diagnosis. LBOHs should communicate with health care providers in their area about these potential situations to avoid contacting patients for case investigations before the patients are aware of their diagnoses. It is usually best to begin an investigation by contacting the reporting clinician.

The most important strategy for improving reporting by health care providers is to develop strong working relationships with providers in your jurisdiction through education, through provision of reports on public health activities and disease data, and by asking for their participation in timely public health initiatives

such as immunization efforts, influenza pandemic planning, bioterrorist response, and/or surveillance for emerging infections.

Laboratory Reporting

Massachusetts General Law [Chapter 111D, Section 6] authorizes MDPH to collect information on evidence of infectious diseases from clinical laboratories. In July 2008, MDPH passed regulations mandating the use of the Electronic Laboratory Reporting (ELR) system for reporting laboratory results on notifiable conditions. As a result, hospital clinical laboratories (n=71) in the state, the state public health laboratory, and two large reference laboratories transmit results using ELR. This has led to timelier reporting of disease as these laboratory results are made available to LBOH upon receipt for follow-up.

Sentinel Surveillance and Reporting of Selected Diseases

In addition to passive, enhanced passive, and active surveillance, the MDPH has several “sentinel” surveillance projects. The primary purpose of sentinel surveillance is the early detection of disease, whether it is emergent or recurrent. The organization receiving data works closely with a select number of sites (e.g., health care providers, laboratories, or school nurses) to supplement standard reporting. Sentinel surveillance is particularly useful in providing warning of the arrival of a disease that is spreading. For diseases that are high in volume and not individually reportable, such as influenza, it can also provide estimates about the burden of disease among the general population. Sentinel surveillance and reporting may also be helpful when monitoring a disease that is newly introduced into a population, such as West Nile virus infection, or when providing information about a disease disproportionately affecting specific populations, such as varicella in schools.

Limitations of Data

Under-Reporting and Incomplete Data

Most surveillance systems rely on data reported by individual health care providers. Health conditions are not reported randomly. However, it is estimated that, depending on the disease, only 5-80% of cases that actually occur will be reported. For example, foodborne illness is often underreported because individuals with disease do not consult a health care provider, or a diagnosis of “gastrointestinal illness” is made and treated without diagnostic tests that might identify the particular pathogen. Reporting bias can distort interpretation of disease data; yet, even with incomplete information, it is often possible to detect key trends and/or sources of infection. For diseases that occur less frequently, the need for completeness becomes more important and each individual case must be treated as a significant event.

Changing Case Definitions

National case definitions establish uniform criteria for disease reporting and are not definitive for diagnosis. Practitioners frequently use different case definitions for health problems. The more complex the disease syndrome, the greater the difficulty in reaching consensus on a case definition. Moreover, with newly emerging diseases and as understanding progresses, case definitions are frequently adjusted to allow greater accuracy. Also, as new diagnostic tests are developed, case definitions sometimes change to incorporate these tests.

Conclusion

The best surveillance lies in the collection of accurate and timely data, and in the careful and correct interpretation of the data. Interpretation should focus on elements that might lead to prevention and control of the condition. Investigators can use surveillance as a basis for appropriate public health actions. The results of such actions can be assessed for effectiveness.

Content of Each Disease Chapter

Section 1: About the Disease

This section is designed to give the reader appropriate background information to understand each disease. There are eight subsections (A–H) that include etiologic agent, clinical description, vectors and reservoirs, modes of transmission, incubation period, period of communicability or infectious period, epidemiology, and bioterrorist potential. Section 1 is meant to serve as a quick synopsis and is not for diagnostic or treatment reference. The two main sources of information used to develop Section 1 are the versions of the *Red Book: Report of the Committee on Infectious Diseases of the American Academy of Pediatrics* and the *Control of Communicable Diseases Manual* that were current at the time chapters were reviewed. If you need more detailed information than given in this section, please consult these sources (refer to the *References* section at the end of each chapter).

Section 2: Reporting Criteria and Laboratory Testing

This section contains two subsections (A and B). The first subsection details what needs to be reported to MDPH; namely, the clinical and/or laboratory information that will lead a LBOH to report to the BID. Some diseases require laboratory confirmation for diagnosis, while others are based on clinical syndrome only. Note that this subsection lists the minimum criteria for reporting. A LBOH may have additional clinical or laboratory information that can be reported to the BID as well. The BID will use the information to apply the case definitions and categorize cases as suspect, probable, confirmed or revoked, and then report non-identifiable information to the Centers for Disease Control and Prevention (CDC) for national surveillance.

The second subsection lists laboratory testing services that are offered at the HSLI and which isolates should be submitted for further testing at HSLI. This information will be up to date at the time of chapter revision. It must be noted, however, that tests available at HSLI can fluctuate over time, and are dependent on available resources and changes in technology. The manual of testing services available at HSLI can be found at <http://www.mass.gov/eohhs/docs/dph/laboratory-sciences/sli-manual-tests-services.pdf>

Section 3: Reporting Responsibilities and Case Investigation

This section contains three subsections (A–C). The first subsection lists the purpose of surveillance and reporting for the disease. The second provides the legal requirements for laboratories and health care providers. The third subsection outlines LBOH legal responsibilities for case investigation and reporting to MDPH. If a disease poses a more serious public health threat than others, the respective chapter heading is flagged “Report Immediately. For some diseases that pose a more serious or widespread public health threat, the BID may have primary responsibility for case investigation, in collaboration with a LBOH. This

section also includes detailed instructions on the use of MAVEN, the Massachusetts Virtual Epidemiologic Network.

Section 4: Controlling Further Spread

This section outlines LBOH responsibilities for controlling and preventing further spread of the disease. Four subsections (A–D) include isolation and quarantine requirements, protection of contacts of cases, managing special situations, and preventive measures. Most of the chapters contain basic information on these topics. Further detailed information (e.g., identifying and investigating an outbreak) may be referenced in other documents and can be obtained by consulting with the BID. For some diseases that pose a more serious public health threat, the BID may take primary responsibility for controlling further spread, in collaboration with a LBOH. This is noted where applicable.

Please Note:

1. This manual is designed to give an overview of LBOH responsibility for surveillance, reporting, control, and prevention of the diseases reportable to MDPH. As experience has proven, case investigation can vary greatly from setting to setting, and it is impossible to address all the questions and situations that may arise. The MDPH Division of Epidemiology and Immunization is available at (617) 983-6800 or (888) 658-2850 to offer guidance and assistance as needed. ISIS is available at (617) 983-6801 for questions regarding reporting requirements and the use of MAVEN.
2. The terms “local board of health (LBOH)” and “local health department” have been used interchangeably.
3. “You” and “your” refers to the audience for which this manual is intended—namely, personnel of LBOH and local health departments.

All information in this manual must be considered in light of newer information available after the time of review. Beginning in 2014 this manual will only be available on-line. Each chapter will include a date it was last reviewed.