

# **Disease Surveillance Skill Development Guide**

## **Sample Responses to Scenario Questions**

## ACTIVITY 1: Disease Surveillance & Reporting

### Scenario A: Communicating Importance

You are working at a public health department and want the local hospital to provide more timely and in depth infectious disease reports. The hospital usually reports only a few infectious diseases to the health department, and those that are reported are often reported late. You meet with the hospital's medical and infection control staff to help them understand the importance of timely and thorough infectious disease reporting.

*How will you explain the importance of infectious disease reporting by health care providers?*

First, determine if hospital staff members are aware that certain infectious diseases are required to be reported to the health department. Provide the staff with a copy of or a link to your health department's disease reporting rules.

Make sure the staff members understand that only a select group of reportable diseases require immediate health department notification. These diseases are relatively rare or infrequent, and are optimally reported to a health department by a clinician who is seeing the patient. Usually these diseases require immediate reporting when suspected (before the disease is confirmed by laboratory or other diagnostic tests) because they pose a large threat to the community and immediate disease investigations and/or disease control measures must be implemented.

*What objections might you anticipate during this discussion (such as not having the staff or resources to allow for reporting)? How will you address these objections?*

The reporting requirements for more commonly occurring infectious diseases tend to be less immediate—that is, they can typically be reported to a health department within one working day. You can discuss reporting capabilities for these diseases with the staff and identify methods that could expedite reporting.

You may need to discuss the implications of early disease recognition, reporting and containment. It may be helpful to indicate how a timely epidemiologic investigation can identify a disease source leading to timely control measures in order to protect others from becoming ill. Since all hospitals need to have emergency preparedness and response plans, it could be quite convincing to provide staff members involved in infection control with examples showing how timely disease reporting is critical for responsiveness for bioterrorism diseases and other emerging infectious disease threats. For example, in October 2001, when the first case of inhalational anthrax was suspected, hospital staff immediately notified the relevant public health authority in Florida. That information was quickly passed on to other government authorities and was crucial to disease recognition and early treatment for other victims. Or, in a more common disease scenario, a notification delay could lead to additional persons becoming sick, because tainted food remained available when the public health investigation of the index case was delayed.

Creating a partnership with the hospital's infection control staff will reap benefits for your health department as well as for the hospital or clinic. Timely disease reporting not only protects the community at large, but also is a way that medical institutions can protect their own staff.

## Scenario B: Explaining Passive & Active Surveillance Methods

After speaking with the hospital staff, it becomes clear to you that they are understaffed.

*Considering the staffing issues, what are the advantages and disadvantages of both passive and active surveillance methods that could be used to enhance infectious disease surveillance for your public health department and the hospital?*

Even though the hospital is understaffed, the staff should be made aware of disease reporting rules and that certain reportable diseases still need to be reported immediately. You may want to focus on methods to assist the facility in timely reporting of the infectious diseases that do not need to be reported immediately.

### Passive Surveillance

- **Advantages:** An advantage of passive surveillance is that your health department may be able to provide standardized disease report cards or a protected web site for the hospital's reporting in order to help reduce staff time expended. A standardized disease report card is quite useful, because the necessary information is specified and hospital staff members do not need to spend time reporting unnecessary data. Your health department may be able to offer 24/7 reporting capability to facilitate timely reporting of diseases of critical concern (i.e., anthrax, botulism, plague, etc.). You could also discuss the possibility of electronic laboratory reporting, in which the hospital's clinical laboratory electronically sends notices of reportable diseases that have been identified through laboratory testing. Upon receipt of an electronic notice, the health department then contacts the hospital or lab to get patient demographics and illness information.
- **Disadvantages:** A disadvantage of passive surveillance is that it is subject to disease non-reporting, or underreporting. Clinicians may be biased in their reporting habits, or reporting of diseases may lack representativeness. Often diseases are not reported because a health care provider may think someone else is going to do it, or may not even know the disease is in fact reportable.

### Active Surveillance

Depending on your health department's capability and priorities and the hospital's policies, a member of your staff may be able to work at the hospital a few hours each month to review emergency room logs, review charts of patients in intensive-care units, or query the infection control staff to actively look for cases.

- **Advantages:** An advantage is that you will likely catch some disease cases that the hospital didn't have the ability to report.
- **Disadvantages:** A disadvantage is that your health department may not be able to provide staff to assist the hospital. If you are able to provide for the staff time, arrangements to have non-hospital staff assist in the hospital typically require discussion among senior level hospital and public health staff.

## Scenario C: Implementing Syndromic Surveillance

The hospital contacts you a week later to discuss implementing a syndromic surveillance system.

*Will this system be sufficient to address their disease reporting responsibilities?*

A syndromic surveillance system will not take the place of other disease reporting responsibilities. Sometimes hospitals think that a syndromic surveillance system will be beneficial for their internal infectious disease tracking activities since “disease” information is compiled and reported at least daily. However, the “disease” information consists mainly of disease signs and symptoms, such as headache, runny nose, chest pain, and fever. Also, the daily reports count the number of patients with those symptoms and statistically compare the number to the number of these complaints for the same time period in previous years. If the statistical comparison suggests there are more complaints for a day than would be suggested by past experience, an alert is issued. Work is required on the part of the hospital’s staff (typically infection control staff) to locate patient charts and determine whether there are infectious disease diagnoses or any pattern to the signs/symptoms suggesting an infectious disease outbreak.

A syndromic surveillance system may be useful for tracking trends, or as an early indicator of seasonal disease activity, such as influenza. Syndromic surveillance is not a method of disease reporting however, it may lead to an outbreak investigation in which disease cases may be found.

*What are the pros and cons of relying on such a system?*

Since syndromic surveillance does not identify or report diseases, there is no benefit to using this type of system for disease reporting. However, there may be some benefit in using syndromic surveillance for disease trends (using syndromes as a proxy for disease). For example, an influenza-like illness (ILI) syndrome may help a health agency understand ILI trends in a community. Syndromic surveillance may be able to alert the health community to an unknown disease threat, but the system’s effectiveness depends on numerous uncontrollable factors, and has not yet been demonstrated.

Syndromic surveillance can be expensive and labor-intensive for the receiving agency (such as a health department). Some initial programming by a network specialist may be required and a statistician may be needed to determine the statistical modeling techniques and parameters for the daily analysis. An epidemiologist is needed to monitor the daily analyses results and to contact the data provider should a signal occur. (A signal may indicate a greater number of signs and symptoms than expected, or may be a false alarm.) Responding to requests from a health department based on a signal from a mathematical model is burdensome for the provider (typically an infection control practitioner) and it may not provide value to the provider to investigate a signal.

Thus, prior to implementing syndromic surveillance, an analysis of the costs (for development, maintenance and signal investigation) and usefulness of the system should be conducted, and all parties should agree on their responsibilities.

*Your agency may be asked to implement a syndromic surveillance system. What information would you need to evaluate whether your agency should implement the system?*

You will need to determine if this system will be useful to your agency's disease surveillance efforts, and if yes, in what way will it be useful. You may want to talk to other agencies that use syndromic surveillance to understand the issues associated with the system. It will be necessary to determine the availability and cost of technical and programming staff, and the time needed per day to monitor the system. Technical staff will need to determine electronic data transfer requirements and speak with their counterparts at the data reporting agency to determine software standards. The data reporting agency will need to determine their willingness to provide staff time to help set up the system and respond to a signal.

## ACTIVITY 2: Outbreak Investigation

### Scenario A: Identifying an Outbreak

It is Tuesday morning and you have received three calls today from people who say they got sick the day after they ate at Restaurant X on Sunday. Two had a fever and diarrhea, one vomited for several hours.

*Is this an outbreak?*

It depends on how your health department defines an outbreak. Some definitions are specific to the disease. For example, one case of smallpox occurring anywhere in the world is considered an outbreak. The definition of an outbreak for some diseases, like pertussis, may vary by setting – household, day care, or hospital. In Minnesota, an outbreak of a foodborne illness is defined as an incident in which two or more persons experience a similar illness after a common exposure. Another state may define a foodborne outbreak more specifically, such as the diagnosis or detection of three or more cases from different households within a one-week time period.

Outbreaks may be detected in a variety of ways. Some reports of suspected outbreaks come from persons who are sick and some come to light as a result of interviewing persons with reportable diseases. Others come from health care providers or other health departments. Restaurants, schools, and health care entities also may report outbreaks.

*What steps do you take to determine if it's a suspected outbreak?*

An epidemiologic investigation, at times combined with investigations conducted by environmental health and/or sanitarian staff, is initiated when there is a common exposure, such as:

- Eating a common food product
- Eating at a common place (picnic, restaurant)
- Drinking or having contact with a common water source, or being in a common location, such as a workplace, health care facility, school, or daycare center

In this scenario, the commonality of dining at Restaurant X suggests an investigation is in order.

*Do you look for more cases?*

Yes. Your investigation should include case-finding.

*Do you look for controls (persons who also ate at X restaurant but didn't get sick)?*

Yes. It is necessary as part of the investigation to interview persons who ate at Restaurant X but did not get sick.

*If yes to either or both questions, how do you look for more cases/controls? Or do you wait to see if you hear about more sick people before you do anything?*

You should not wait to hear about additional sick persons before initiating an investigation. You may find additional cases and controls from interviewing sick persons. For example, when interviewing a sick person, you might ask if anyone else in their household is sick with similar symptoms and if anyone else in their household dined at Restaurant X but is well. You may also ask who they dined with at Restaurant X to expand your case- and control-finding. Sometimes you may be able to obtain persons to contact from restaurant reservations lists or credit card receipts. You will also be communicating with restaurant staff, who ill patrons may have contacted. After interviewing restaurant workers, you may be able to expand your case/control list. It is also important to determine if restaurant workers have been or are sick.

As part of the investigation, you want to be able to determine if a sick person is actually a “case.” You will want to ask those who are sick who have not submitted a stool sample to a clinician if they would consent to submit one to the health department for analysis. You can follow up with clinicians on the results of stool samples or other diagnostic tests for patients who have seen a clinician.

## Scenario B: Continuing the Investigation

It's Tuesday afternoon and you've heard from a family of four who got sick after eating at Restaurant X yesterday.

*Do you do anything differently than in the previous scenario?*

You continue your investigation. You should determine whether these additional possible cases represent an increase in the number of cases that would be expected in relation to the size of the town/city.

*Do you contact the restaurant? Do you contact the local health department's sanitarian?*

Contact both if they have not been contacted earlier. Illness histories, work schedules, and restaurant duties should be obtained from all food handlers to determine if one may have contributed to the outbreak. The sanitarian will assess food preparation and storage practices to determine if one of these procedures contributed to the outbreak.

*How do you know if the illness cases are related?*

A case definition needs to be established. You may have some idea that the illness cases are related based on illness history and onset of illness after dining at Restaurant X. For some gastrointestinal diseases, you will have more of an indication that the illnesses are related based on laboratory results. When you've collected enough data from the interviews, you will conduct some basic statistical tests to see if you can identify a common exposure.

*Do you contact any laboratories?*

Your most productive method of additional case finding, if needed, would be to alert the general health care community, including local laboratories, to be on alert for suspected or confirmed cases.

## Scenario C: Taking Action

After thoroughly interviewing sick and non-sick patrons of Restaurant X, it seems as though the likely source of the illness is lettuce or green onions.

*What actions can be taken to prevent others from becoming ill as a result of dining at Restaurant X?*

The actions depend on the sanitarian's report and/or the suspected nature of the contamination. For example, if the investigation indicated a worker contaminated these items during the course of food preparation, the nature of the contamination must be corrected (excluding ill workers from food preparation). Staff should be instructed on proper handwashing. Depending on the nature of the contamination, corrective actions could include reinstruction on limited use of bare-hand contact (using gloves or utensils) with these ready-to-eat food items, maintaining an employee illness log, or ensuring handwashing stations are equipped with appropriate items, such as nail brushes and paper towels. If during the course of the outbreak investigation, it appears that the source of the outbreak is not due to food handling procedures at the restaurant, other partners such as the Department of Agriculture and other governmental agencies may become involved in the investigation.