Chapter 15

Surveillance and Outbreak Investigation

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ADDITIONAL RESOURCES

These related resources are found either in the appendix at the back of this book or on the book’s website at http://evolve.elsevier.com/stanhope/foundations.

Evolve Website

- Community Assessment Applied
- Case Study, with questions and answers
- Quiz review questions
- WebLinks, including link to Healthy People 2010 website

OBJECTIVES

After reading this chapter, the student should be able to:

1. Define public health surveillance.
2. List types of surveillance systems.
3. Identify steps in planning, analyzing, interviewing, and evaluating surveillance.
4. Recognize sources of data used when investigating a disease/condition outbreak.
5. Describe role of the nurse in surveillance and outbreak investigation to the national core competencies for public health nurses.

CHAPTER OUTLINE

DISEASE SURVEILLANCE
Definitions and Importance
Uses of Public Health Surveillance
Purposes of Surveillance
Collaboration among Partners
Nurse Competencies
Data Sources for Surveillance
NATIONAL NOTIFIABLE DISEASES
STATE NOTIFIABLE DISEASES
TYPES OF SURVEILLANCE SYSTEMS

KEY TERMS

biological terrorism: an intentional release of viruses, bacteria, or their toxins for the purpose of harming or killing.
chemical terrorism: the intentional release of hazardous chemicals into the environment for the purpose of harming or killing.
common source outbreak: an outbreak in which a group is exposed to a common noxious influence such as the release of noxious gases.
disease surveillance: the ongoing systematic collection, analysis, interpretation, and dissemination of specific health data for use in public health.
Disease surveillance has been a part of public health protection since the 1200s during the investigations of the bubonic plague in Europe. The Constitution of the United States provides for “police powers” necessary to preserve health safety as well as other events (see Chapter 7). These powers include public health surveillance. State and local “police powers” also provide for surveillance activities. Health departments usually have the legal authority to investigate unusual clusters of illness as well (U.S. Department of Health and Human Services, 2001).

**BRIEFLY NOTED**

In 1901 the United States began the requirement for reporting cases of cholera, smallpox, and tuberculosis.

**DISEASE SURVEILLANCE**

**DEFINITIONS AND IMPORTANCE**

**Disease surveillance** is “the ongoing systematic collection, analysis, interpretation and dissemination of specific health data for use in public health” (Teutsch and Churchill, 2000). Surveillance provides a means for nurses to monitor disease trends in order to reduce morbidity and mortality and to improve health (Ching, 2002).

Surveillance is a critical role function for nurses practicing in the community. It is important because it generates knowledge of a disease or event outbreak patterns (including timing, geographic distribution, and susceptible populations).

Although surveillance was initially devoted to monitoring and reducing the spread of infectious diseases, it is now used to monitor and reduce chronic diseases and injuries as well as “environmental and occupational exposures” (Ching, 2002) and personal health behaviors. Surveillance systems help nurses and other professionals monitor emerging infections and bioterrorist outbreaks (Pryor and Veenema, 2003). Bioterrorism is one example of an event creating a critical public health concern that involves environmental exposures that must be monitored. This event also requires serious planning in order to be able to respond quickly and effectively.

**Biological terrorism** is defined as “an intentional release of viruses, bacteria, or their toxins for the purpose of harming or killing… citizens” (Centers for Disease Control and Prevention, 2001a). **Chemical terrorism** is the intentional release of hazardous chemicals into the environment for the purpose of harming or killing (Centers for Disease Control and Prevention, 2001a). In the event of a bioterrorist attack,
imagine how difficult it would be to control the spread of biological agents such as botulism or anthrax or chemical agents such as sarin or ricin if no data were available about these agents, their resulting diseases or symptoms, and their usual incidence (new cases) patterns in the community. (See Box 15-1 for a summary of the features of surveillance.)

USES OF PUBLIC HEALTH SURVEILLANCE

Public health surveillance can be used to facilitate the following (Centers for Disease Control and Prevention, 2004):
- Estimate the magnitude of a problem (disease or event).
- Determine the geographic distribution of an illness or symptoms.
- Portray the natural history of a disease.
- Detect epidemics and define a problem.
- Generate hypotheses and stimulate research.
- Evaluate control measures.
- Monitor changes in infectious agents.
- Detect changes in health practices.
- Facilitate planning.

PURPOSES OF SURVEILLANCE

Surveillance helps public health departments identify trends and unusual disease patterns, set priorities for using scarce resources, and develop and evaluate programs for commonly occurring and universally occurring diseases or events (Box 15-2).

Surveillance activities can be related to the core functions of public health—assessment, policy development, and assurance. Disease surveillance helps establish baseline (endemic) rates of disease occurrence and patterns of spread. Surveillance makes it possible to initiate a rapid response to an outbreak of a disease or event that can cause a health problem. Surveillance data are assessed and analyzed, and interpretations of these data analyses are used to develop policies that better protect the public from problems such as emerging infections, bioterrorist biological and chemical threats, and injuries from problems such as motor vehicle accidents. Surveillance makes it possible to have ongoing monitoring in place to ensure that disease and event patterns improve rather than deteriorate. It can also make it possible to study whether the clinical protocols and public health policies that are in place can be enhanced based on current science so that disease rates actually decline.

Surveillance data are very helpful in determining whether a program is effective. Such data make it possible to determine whether public health interventions are effective in reducing the spread of disease or the incidence of injuries.

COLLABORATION AMONG PARTNERS

A quality surveillance system requires collaboration among a number of agencies and individuals: federal agencies, state and local public health agencies, hospitals, health care providers, medical examiners, veterinarians, agriculture, pharmaceutical agencies, emergency management, and law enforcement agencies, as well as 911 systems, ambulance services, urgent care and emergency departments, poison control centers, nurse hotlines, school, and industry. Such collaboration promotes the development of a comprehensive plan and a directory of emergency responses and contacts for effective sharing of communication and information. Nurses are often in the forefront of responses to be made in the surveillance process whether working in a small rural agency or a large urban agency; within the health department, school, or urgent care center; or on the telephone performing triage services during a disaster. It is the nurse who sees the event first (Gebbie, Rosenstock, and Hernandez, 2003).

NURSE COMPETENCIES

The national core competencies for public health nurses were developed from the work of the Council on Linkages Between Academia and Public Health Practice (Core Competencies for Public Health Professionals, 2000) and by the Quad Council of Public Health Nursing Organizations (2003). These competencies are divided into eight practice domains: analytic assessment skills, policy/program development, communication, cultural competency, community dimensions of practice, basic public health sciences, financial planning/management, and leadership.

To be a participant in surveillance and investigation activities, the staff nurse must have the following knowledge related to the core competencies:

1. Analytic assessment skills:
   - Defining the problem
   - Determining a cause
• Identifying relevant data and information sources
• Partnering with others to give meaning to the data collected
• Identifying risks

2. Communication:
• Providing effective oral and written reports
• Soliciting input from others and effectively presenting accurate demographic, statistical, and scientific information to other professionals and the community at large

3. Community dimensions of practice:
• Establishing and maintaining links during the investigation
• Collaborating with partners
• Developing, implementing, and evaluating an assessment to define the problem

4. Basic public health science skills:
• Identifying individual and organizational responsibilities
• Identifying and retrieving current relevant scientific evidence

5. Leadership and systems thinking
• Identifying internal and external issues that have an effect on the investigation
• Promoting team and organizational efforts
• Contributing to developing, implementing, and monitoring of the investigation

Although the staff nurse participates in these activities, the advanced practice public health nurse should be proficient in applying these competencies.

The Minnesota Model of Public Health Interventions: Applications for Public Health Nursing Practice (2001, pp. 15, 16) suggests that surveillance is one of the interventions related to nursing practice in public health. The model provides seven basic steps of surveillance for nurses to follow:

1. Consider whether surveillance as an intervention is appropriate for the situation.
2. Organize the knowledge of the problem, its natural course of history, and its aftermath.
3. Establish clear criteria for what constitutes a case.
4. Collect sufficient data from multiple valid sources.
5. Analyze the data.
6. Interpret and disseminate the data to decision makers.
7. Evaluate the impact of the surveillance system.

DATA SOURCES FOR SURVEILLANCE
Clinicians, health care agencies, and laboratories report cases to state health departments. Data also come from death certificates and administrative data such as discharge reports and billing records (Pryor and Veenema, 2003). The following are select sources of mortality and morbidity data:

1. Mortality data are often the only source of health-related data available for small geographic areas. Examples include the following:
   • Vital statistics reports (e.g., death certificates, medical examiner reports, birth certificates)

2. Morbidity data include the following:
   • Notifiable disease reports
   • Laboratory reports
   • Hospital discharge reports
   • Billing data
   • Outpatient health care data
   • Specialized disease registries
   • Injury surveillance systems
   • Environmental surveys
   • Sentinel surveillance systems

A good example of a process in place to collect morbidity data is the National Program of Cancer Registries. This program provides for monitoring of the types of cancers found in a state and the locations of the cancer risks and health problems in the state.

Each of the data sources has the potential for underreporting or incomplete reporting. However, if there is consistency in the use of surveillance methods, the data collected will show trends in events or disease patterns that may indicate

### Healthy People 2010

#### Surveillance Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-12</td>
<td>Establish a single toll-free number for access to poison control centers on a 24-hour basis throughout the United States.</td>
</tr>
<tr>
<td>3-14</td>
<td>Increase the number of states that have a statewide population-based cancer registry that captures case information on at least 95% of the expected number of reportable cancers.</td>
</tr>
<tr>
<td>8-28</td>
<td>Increase the number of local health departments or agencies that use data from surveillance of environmental risk factors as part of their vector control programs.</td>
</tr>
<tr>
<td>10-2</td>
<td>Reduce outbreaks of infections caused by key foodborne bacteria.</td>
</tr>
<tr>
<td>14-31</td>
<td>Increase the number of persons under active surveillance for vaccine safety via large linked databases.</td>
</tr>
<tr>
<td>15-10</td>
<td>Increase the number of states (including the District of Columbia) with statewide emergency department surveillance systems that collect data on external causes of injury.</td>
</tr>
<tr>
<td>15-11</td>
<td>Increase the number of states (including the District of Columbia) that collect data on external causes of injury through hospital discharge data systems.</td>
</tr>
<tr>
<td>23-2</td>
<td>Increase the proportion of federal, tribal, state, and local health agencies that have made information available to the public in the past year on the Leading Health Indicators, Health Status Indicators, and Priority Data Needs.</td>
</tr>
<tr>
<td>23-3</td>
<td>Increase the proportion of all major national, state, and local health data systems that use geocoding to promote nationwide use of geographic information systems (GIS) at all levels.</td>
</tr>
<tr>
<td>23-4</td>
<td>Increase the proportion of population-based Healthy People 2010 objectives for which national data are available for all population groups identified for the objective.</td>
</tr>
</tbody>
</table>

a change needed in a program or a needed prevention intervention to reduce morbidity or mortality (Centers for Disease Control and Prevention, 2006a).

Mortality data assist in identifying differences in health status among groups, populations, occupations, and communities; monitor preventable deaths; and help to examine cause and effect factors in diseases. Vital statistics can be used to plan programs and to monitor programs to meet Healthy People 2010 goals.

The sentinel surveillance system provides for the monitoring of key health events when information is not otherwise available or in vulnerable populations to calculate or estimate disease morbidity (Centers for Disease Control and Prevention, 2003).

### NATIONAL NOTIFIABLE DISEASES

Box 15-3 shows the national notifiable infectious diseases. Reporting of disease data by health care providers, laboratories, and public health workers to state and local health departments is essential if trends are to be accurately monitored. "The data provide the basis for detecting disease outbreaks, for identifying person characteristics, and for calculating incidence, geographic distribution, and temporal trends. They are used to initiate prevention programs, evaluate established prevention and control practices, suggest new intervention strategies, identify areas for research, document the need for disease control funds, and help answer questions from the community." (Cabinet for Human Resources [CHS], 2004).

**Box 15-3 Infectious Diseases Designated as Notifiable at the National Level—United States, 2006**

<table>
<thead>
<tr>
<th>Disease / Syndrome / Infection</th>
<th>Disease / Syndrome / Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquired immunodeficiency syndrome (AIDS)</td>
<td>Neurosyphilis</td>
</tr>
<tr>
<td>Anthrax</td>
<td>Pertussis</td>
</tr>
<tr>
<td>Botulism, foodborne</td>
<td>Plague</td>
</tr>
<tr>
<td>Botulism, infant</td>
<td>Poliomyelitis, paralytic</td>
</tr>
<tr>
<td>Botulism, other (includes wound and unspecified)</td>
<td>Powassan virus neuroinvasive disease</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>Powassan virus nonneuroinvasive disease</td>
</tr>
<tr>
<td>California serogroup virus neuroinvasive disease</td>
<td>Psittacosis (Ornithosis)</td>
</tr>
<tr>
<td>California serogroup virus nonneuroinvasive disease</td>
<td>Q fever</td>
</tr>
<tr>
<td>Chancroid</td>
<td>Rabies, animal</td>
</tr>
<tr>
<td>Chlamydia trachomatis genital infection</td>
<td>Rabies, human</td>
</tr>
<tr>
<td>Cholera</td>
<td>Rocky Mountain spotted fever</td>
</tr>
<tr>
<td>Coccioidiomycosis</td>
<td>Rubella</td>
</tr>
<tr>
<td>Cryptosporidiosis</td>
<td>Rubella, congenital syndrome</td>
</tr>
<tr>
<td>Cryptosporiasis</td>
<td>Salmonellosis</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>Severe acute respiratory syndrome-associated coronavirus (SARS-CoV) disease</td>
</tr>
<tr>
<td>Eastern equine encephalitis virus neuroinvasive disease</td>
<td>Shiga toxin-producing Escherichia coli (STEC)</td>
</tr>
<tr>
<td>Eastern equine encephalitis virus nonneuroinvasive disease</td>
<td>Shigelllosis</td>
</tr>
<tr>
<td>Ehrlichiosis, human granulocytic (HGE)</td>
<td>Smallpox</td>
</tr>
<tr>
<td>Ehrlichiosis, human monocytic (HME)</td>
<td>St. Louis encephalitis virus neuroinvasive disease</td>
</tr>
<tr>
<td>Ehrlichiosis, human other or unspecified</td>
<td>Streptococcus pneumoniae, drug-resistant</td>
</tr>
<tr>
<td>Giardiasis</td>
<td>Syphilis, congenital syndrome</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>Syphilis, early latent</td>
</tr>
<tr>
<td>Haemophilus influenzae, invasive disease</td>
<td>Syphilis, late latent</td>
</tr>
<tr>
<td>Hansen’s disease (leprosy)</td>
<td>Syphilis, primary</td>
</tr>
<tr>
<td>Hantavirus pulmonary syndrome</td>
<td>Syphilis, secondary</td>
</tr>
<tr>
<td>Hemolytic uremic syndrome, postdiarrheal</td>
<td>Syphilis, total primary and secondary</td>
</tr>
<tr>
<td>Hepatitis A, acute</td>
<td>Syphilis, latent, unknown duration</td>
</tr>
<tr>
<td>Hepatitis B, acute</td>
<td>Tetanus</td>
</tr>
<tr>
<td>Hepatitis B virus infection, chronic</td>
<td>Toxic shock syndrome (other than streptococcal)</td>
</tr>
<tr>
<td>Hepatitis B virus infection, perinatal acute</td>
<td>Trichinelllosis</td>
</tr>
<tr>
<td>Hepatitis C virus infection, chronic or resolved</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Hepatitis C virus infection, acute</td>
<td>Tularemia</td>
</tr>
<tr>
<td>HIV infection, adult</td>
<td>Typhoid fever</td>
</tr>
<tr>
<td>HIV infection, pediatric</td>
<td>Vancomycin-intermediate Staphylococcus aureus (VISA)</td>
</tr>
<tr>
<td>Influenza-associated pediatric mortality</td>
<td>Vancomycin-resistant Staphylococcus aureus (VRSA)</td>
</tr>
<tr>
<td>Legionellosis</td>
<td>Varicella</td>
</tr>
<tr>
<td>Listeriosis</td>
<td>West Nile virus neuroinvasive disease</td>
</tr>
<tr>
<td>Lyme disease</td>
<td>West Nile virus nonneuroinvasive disease</td>
</tr>
<tr>
<td>Malaria</td>
<td>Western equine encephalitis virus neuroinvasive disease</td>
</tr>
<tr>
<td>Measles, total</td>
<td>Western equine encephalitis virus nonneuroinvasive disease</td>
</tr>
<tr>
<td>Meningococcal disease</td>
<td>Yellow fever</td>
</tr>
<tr>
<td>Mumps</td>
<td></td>
</tr>
</tbody>
</table>

The Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists have a policy that requires state health departments to report selected diseases to the CDC, National Notifiable Disease Surveillance System (NNDSS). The data for nationally notifiable diseases from 50 states, the U.S. territories, New York City, and the District of Columbia are published weekly in the Morbidity and Mortality Weekly Report (MMWR). Data collection about these diseases and revision of statistics are ongoing. Annual updated final reports are published in the CDC Summary of Notifiable Diseases—United States (Centers for Disease Control and Prevention, 2006b).

STATE NOTIFIABLE DISEASES

Requirements for reporting diseases are mandated by law or regulation. Although each state differs in the list of reportable diseases, the usefulness of the data depends on “uniformity, simplicity, and timeliness.” Because state requirements differ, not all nationally notifiable diseases are legally mandated for reporting in a state. For legally reportable diseases, states compile disease incidence data (new cases) and transmit the data electronically, weekly, to the CDC through the National Electronic Telecommunications System for Surveillance (NETSS).

BRIEFLY NOTED

To determine which of the national notifiable diseases are reportable in your state, go to your state health department website.

TYPES OF SURVEILLANCE SYSTEMS

Informatics is essential to the mission of protecting the public’s health. Surveillance systems are designed to assist public health professionals in the early detection of disease and event outbreaks in order to intervene and reduce the potential for morbidity or mortality, or to improve the public’s health status (NEDSS Working Group, 2001; Wagner et al., 2001). Surveillance systems in use today are defined as passive, active, sentinel, and special.

PASSIVE SYSTEM

In the passive system, case reports are sent to local health departments by health care providers (i.e., physicians, nurses) or laboratory reports of disease occurrence are sent to the local health department. The case reports are summarized and forwarded to the state health department, national government, or organizations responsible for monitoring the problem, such as the CDC or an international organization such as the World Health Organization.

ACTIVE SYSTEM

In the active system, the nurse, as an employee of the health department, may begin a search for cases through contacts with local health providers and health care agencies. In this system, the nurse names the disease and/or the event and gathers data about existing cases to try to determine the magnitude of the problem (how widespread it is).

SENTINEL SYSTEM

In the sentinel system, trends in commonly occurring diseases or key health indicators are monitored (Healthy People 2010). A disease and/or an event may be the sentinel or a population may be the sentinel. In this system a sample of health providers or agencies is asked to report the problem. The system is useful because it helps monitor trends in commonly occurring diseases and/or events.

SPECIAL SYSTEMS

Special systems are developed for collecting particular types of data; these may be a combination of active, passive, and/or sentinel systems. As a result of bioterrorism, newer systems called syndromic surveillance systems are being developed to monitor illness syndromes or events. This approach requires the use of automated data systems to report continued (real time) or daily (near real time) disease outbreaks (Broome et al., 2004) (Box 15-4).

Although all of the systems are important, the nurse is most likely to use the active or passive systems. A passive system may involve the use of the state reportable disease system to complete a community assessment or MAPPs. The active system is used to investigate the possibility of food poisoning, for example, when several school children become ill after eating lunch in the school cafeteria or at the local hot dog stand, or to follow up the contacts of a newly diagnosed client with tuberculosis or a sexually transmitted disease (STD) (Underwood et al., 2003).

THE INVESTIGATION

INVESTIGATION OBJECTIVES

Any unusual increase in disease incidence (new cases) or any unusual event in the community should be investigated. The system used for investigation depends on the intensity...
A study was conducted to identify pediatric age groups for influenza vaccination using a real-time regional surveillance system. Evidence has shown that vaccination of school-aged children significantly reduces the transmission of influenza. To explore the possibility of expanding the recommended target population for flu vaccination to include preschool-aged children, the researchers sought to determine which age groups within the pediatric population develop influenza the earliest and are most strongly linked with mortality in the population.

Using a real-time regional surveillance system, patient visits for respiratory illness were monitored in six Massachusetts health care settings. Data from a variety of health-monitoring systems were used: the Automated Epidemiologic Geotemporal Integrated Surveillance system, the National Bioterrorism Syndromic Surveillance Demonstration Project, and the Centers for Disease Control and Prevention U.S. Influenza Sentinel Providers Surveillance Network. Data were retrospectively identified and included patients seen between January 1, 2000 and September 30, 2004.

Study findings indicate that patient age significantly influences the timeliness of presenting at the health care facility with influenza symptoms ($p = 0.026$), with pediatric age groups arriving first ($p < 0.001$); children ages 3 to 4 years are consistently the earliest ($p = 0.0058$). Age also influences the degree of prediction of mortality ($p = 0.036$). Study findings support the strategy to vaccinate preschool-aged children. Furthermore, monitoring respiratory illness in the ambulatory care and pediatric emergency department populations using syndromic surveillance systems was shown to provide even earlier detection and better prediction of influenza activity than the current CDC’s sentinel surveillance system.

NURSE USE: It is important to offer the flu vaccine to high-risk populations, such as young children, as recommended by the Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices. Influenza vaccination is the primary method for preventing influenza and its severe complications.


Patterns of occurrence can be identified when investigating a disease or event. These patterns are used to define the boundaries of a problem to help investigate possible causes or sources of the problem. A common source outbreak refers to a group exposed to a common noxious influence such as the release of noxious gases (for example, ricin in the Japanese subway system several years ago). In a point source outbreak all persons exposed become ill at the same time, during one incubation period. A propagated outbreak (which was described by Gotz et al., [2002] while investigating a foodborne gastroenteritis caused by a Norwalk-like virus) involves a common source followed by secondary exposures related to person-to-person contact, as in the spreading of influenza. Intermittent or continuous source cases may be exposed over a period of days or weeks, as in the recent food poisonings at a restaurant chain throughout the United States as a result of the restaurant’s purchase of contaminated green onions. A propagated outbreak does not have a common source and spreads gradually from person to person over more than one incubation period, such as the spread of tuberculosis from one person to another.

**BRIEFLY NOTED**

In today’s environment of tight budgets, how would nurses know which programs should be developed and continued without good data to indicate what are the most commonly occurring public health problems? How would we know if programs were effective without a source of valid and reliable ongoing data?
Causal Factors from the Epidemiologic Triangle

Factors that must be considered as causes of outbreak are categorized as agents, hosts, and environmental factors (see Chapter 9). The belief is that these factors may interact to cause the outbreak and therefore the potential interactions must be examined. Box 15-5 presents definitions used to classify agents in an attack. Box 15-6 lists the type of agent factors that may be present. The host factors associated with cases may be age, sex, race, socioeconomic status, genetics, and lifestyle choices (for example, cigarette smoking, sexual practices, contraception, eating habits). The environmental factors that may be related to a case are physical (for example, weather, temperature, humidity, physical surroundings) or biological (such as insects that transmit the agent). Some of the socioeconomic factors that might affect the development of a disease and/or an event are behavior (could be terrorist behaviors), personality, cultural characteristics of the group, crowding, sanitation, and the availability of health services.

WHEN TO INVESTIGATE

An unusual increase in disease incidence should be investigated. The amount of effort that goes into an investigation depends on the severity or magnitude of the problem, the numbers in the population who are affected, the potential for spreading the disease, and the availability and effectiveness of intervention measures to resolve the problems. Most of the outbreaks of diseases (or increased incidence rates) occur naturally and/or are predictable when compared with the consistent patterns of previous outbreaks of a disease, such as influenza, tuberculosis, or common infectious diseases. When a disease and/or an event outbreak occurs as a result of the purposeful introduction of an agent into the population, then the predictable patterns may not exist. Treadwell et al. (2003) provide clues to be used when trying to determine the existence of bioterrorism. These clues are simplified and appear in Box 15-7 (U.S. Department of Health and Human Services, 2001). The How To box provides a brief guide to conducting the investigation.
Levels of Prevention For Surveillance Activities

PRIMARY PREVENTION
Develop a community security plan to reduce the potential for a terrorist attack.

SECONDARY PREVENTION
Investigate an outbreak of food poisoning in a local community.

TERTIARY PREVENTION
Provide health care and treatment for those infected by SARS.

INTERVENTIONS AND PROTECTION

Remember that disease and event surveillance systems exist to help improve the health of the public through the systematic and ongoing collection, distribution, and use of health-related data. A nurse can contribute to such systems and best use the data collected through such systems to help manage endemic health problems and those that are emerging, such as evolving infectious diseases and bioterrorism (human-made) health problems. The functions of surveillance and investigation include detecting cases, estimating the impact of disease or injury, showing the national history of a health condition, determining the distribution and spread of illness, generating hypotheses, evaluating prevention and control measures, and facilitating planning (Broome et al., 2004). Response to bioterrorism or to a large-scale infectious disease outbreak may require the use of emergency public health measures such as quarantine, isolation, closing public places, seizing property, mandatory vaccination, travel restrictions, and disposal of the deceased. Suggestions for protecting health care providers from exposure include the use of standard precautions when coming in contact with broken skin or body fluids, the use of disposable nonsterile gowns and gloves followed by adequate handwashing after removal, and the use of a face shield (U.S. Department of Health and Human Services, 2001).

CLINICAL APPLICATION

As a clinical project the health department asked the public health nursing class at the university to develop a community service message to air on local radio about the potential of a pandemic flu.

What does the message need to contain to help the community prepare?
Answer is in the back of the book.

REMEMBER THIS!

• Disease surveillance has been a part of public health protection since the 1200s during the investigations of the bubonic plague in Europe.
• Surveillance provides a means for nurses to monitor disease trends in order to reduce morbidity and mortality and to improve health.

• Surveillance is a critical role function for nurses practicing in the community.
• Surveillance is important because it generates knowledge of a disease or event outbreak patterns.
• Surveillance focuses on the collection of process and outcome data.
• Although surveillance was initially devoted to monitoring and reducing the spread of infectious diseases, it is now used to monitor and reduce chronic diseases and injuries as well as environmental and occupational exposures.
• Surveillance activities can be related to the core functions of public health assessment, policy development, and assurance.
• A quality surveillance system requires collaboration among a number of agencies and individuals.
• The Minnesota Model of Public Health Interventions: Applications for Public Health Nursing Practice (2001) suggests that surveillance is one of the interventions related to public health nursing practice.
• Clinicians, health care agencies, and laboratories report cases to state health departments. Data also come from death certificates and administrative data such as discharge reports and billing records.
• Each of the data sources has the potential for underreporting or incomplete reporting. However, if there is consistency in the use of surveillance methods, the data collected will show trends in events or disease patterns that may indicate a change needed in a program or a needed prevention intervention to reduce morbidity or mortality.
• The sentinel surveillance system provides for the monitoring of key health events when information is not otherwise available or in vulnerable populations to calculate or estimate disease morbidity.
• Reporting of disease data by health care providers, laboratories, and public health workers to state and local health departments is essential if trends are to be accurately monitored.
• Requirements for reporting diseases are mandated by law or regulation.
• Surveillance systems in use today are defined as passive, active, sentinel, and special.
• Any unusual increase in disease incidence (new cases) or an unusual event in the community should be investigated.
• Patterns of occurrence can be identified when investigating a disease or event. These patterns are used to define the boundaries of a problem to help investigate possible causes or sources of the problem.
• Factors that must be considered as causes of outbreak are categorized as agents, hosts, and environmental factors.
• An unusual increase in disease incidence should be investigated.
• Functions of surveillance and investigation include detecting cases, estimating the impact of disease or injury, showing the national history of a health condition, determining the distribution and spread of illness, generating hypotheses, evaluating prevention and control measures, and facilitating planning.
WHAT WOULD YOU DO?

1. Call the local health department and attend an emergency response team planning meeting. How many agencies are involved? Determine the roles of each agency. Does the nurse have a role on the team? Explain.

2. Go to the Health Hazard Evaluation program website (see WebLinks on the book’s website). What is the purpose of this program? How would information from the website be used in a disease investigation?

REFERENCES


