The Role of Providers and Health Plans in Infectious Disease Surveillance

CDC MATTERS

DENISE KOO, MD, MPH
Director, Division of Public Health Surveillance and Informatics

BLAKE CALDWELL, MD, MPH
Director, Office of HealthCare Partnerships

Division of Prevention Research and Analytic Methods

Epidemiology Program Office
Centers for Disease Control and Prevention
Atlanta, Ga

Effective Clinical Practice. 1999;2:247–252.

Public health surveillance for infectious disease is a cornerstone of public health decision making and practice. Surveillance provides crucial information for monitoring the health of the public, identifying public health problems, and triggering action to prevent further illness. Such information is vital to the nation's health, and its analysis and dissemination frequently affect everyday life and clinical practice. For example, early in 1993, an alert pediatric gastroenterologist notified the Washington State Department of Health of an increase in emergency department visits for bloody diarrhea and of the hospitalization of three children with the hemolytic uremic syndrome.[1] The Department of Health rapidly intensified surveillance for *Escherichia coli* O157:H7 infection, a reportable condition in Washington, and began an outbreak investigation. Within 1 week, the Department had identified hamburgers from a fast-food restaurant as the cause of the outbreak, and the chain voluntarily recalled all hamburger meat from its restaurants in Washington. This quick response resulted in removal of more than 250,000 potentially contaminated hamburgers and prevented an estimated 800 cases of infection. Cooking tests also showed that most regular hamburgers cooked according to the chain's policy did not attain the internal temperature (68.3°C) required by the state, and this led to a change in restaurant policy nationwide.

Public health surveillance—conducted by the Centers for Disease Control and Prevention (CDC) in collaboration with state and local public health partners—has identified many other outbreaks. Prominent examples include identification of the recent multistate outbreaks of salmonellosis caused by contamination of oat cereal with *Salmonella enteritidis* serotype Agona[2] and salmonellosis caused by contamination of ice cream with *S. enteritidis,*[3] as well as recognition of changes in the resistance to antibiotics of *Mycobacterium tuberculosis* and *Neisseria gonorrhoeae* (which resulted in important recommendations for changes in the initial drug treatment of tuberculosis and gonorrhea[4–7]). In the late 1980s, surveillance facilitated the recognition that a single dose of measles vaccine was insufficient for lifelong immunity.[8, 9] Temporary emergency surveillance systems led to identification of the causal association of high-absorbency tampons with the toxic-shock syndrome and *Staphylococcus aureus* infection.[10, 11]

Public health surveillance also provides data about the incidence of disease in the community—data that can help raise or lower the threshold of clinical suspicion for a particular infectious disease, encouraging early detection and appropriate treatment and perhaps avoiding clinical sequelae, unnecessary treatment, and treatment for the wrong disease. For example, in 1993, CDC and the American Thoracic Society recommended that initial four-drug therapy be used to treat tuberculosis[4, 5] in regions with a prevalence of isoniazid resistance of 4% or more, and identification of these regions relies on community surveillance data. Furthermore, as part of the response to detected cases of infection, health departments can facilitate tracking and subsequent prophylaxis of persons who have been exposed to a disease.

Public health surveillance data are readily available. Local and state health departments disseminate data specific to their jurisdiction, often in periodic newsletters available to the public or increasingly over the Internet. CDC coordinates and publishes data on national notifiable diseases from the states each week in *Morbidity and Mortality Weekly Report (MMWR)* and at the end of each year in *Summary of Notifiable*

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Diseases[12] (information about notifiable diseases is also available at http://www.cdc.gov/epo/phs.htm). CDC publishes reports about trends in specific diseases, outbreak investigations, and recommendations for changes in immunization schedules or antibiotic treatment. In this paper, we review the process of obtaining surveillance data and explore concerns about this process.

How Data for Infectious Disease Surveillance Are Obtained

As exemplified by the Washington State pediatrician, effective public health surveillance for infectious diseases starts with the health care provider. Reports from providers and laboratories about individual cases of notifiable diseases are generally sent to the local health department (by telephone, facsimile, or morbidity report form), and the local health department passes the information on to the state health department. **Table 1** lists the nationally notifiable diseases. Contact numbers for the state health departments are shown in the **Appendix**. Each state health department reports its data electronically to CDC on a weekly basis. Outbreaks or cases that require an urgent response (e.g., a case of botulism, a case of meningococcal meningitis, or a multistate outbreak of foodborne disease) are immediately reported.

This surveillance system, the National Notifiable Diseases Surveillance System, is one of the oldest surveillance systems in the United States, and it is built on a longstanding partnership between CDC and state and local health departments.[13] Public health officials at state health departments and CDC collaborate to determine which diseases should be nationally notifiable although reporting to CDC by the states is voluntary. The Council of State and Territorial Epidemiologists, with input from CDC, annually recommends additions and deletions to the list of nationally notifiable diseases. A disease may be added to the list as a new pathogen emerges (e.g., *E. coli* O157:H7 infection was added in 1993, after the outbreak discussed above, and cryptosporidiosis and hantavirus infection were added in 1994) or deleted as its incidence decreases (e.g., rheumatic fever and lymphogranuloma venereum were removed from the list in 1994). Reporting by providers and laboratories is mandated by state legislation or regulation, so the list of notifiable diseases varies slightly by state.[14] For a complete list of nationally notifiable diseases and reportability by state, see http://www.cste.org.

Provider and Plan Concerns about Surveillance

There are three concerns that health care providers and plans might have about participating in infectious disease surveillance.

TABLE 1
Nationally Notifiable Diseases as of December 1998

DISEASE	PROVISIONAL NUMBER OF CASES FOR 1998 AS OF JANUARY 2, 1999
Arthropod-borne or zoonotic diseases	
Lyme disease	14,646
Rabies, animal	7084
Malaria	1381
Rocky Mountain spotted fever	345
Encephalitis, California serogroup*	91
Brucellosis	62
Psittacosis	49
Encephalitis, St. Louis*	26
Trichinosis	24
Hantavirus pulmonary syndrome	19
Plague	8
Encephalitis, eastern equine*	4
Anthrax	–
Encephalitis, western equine*	–
Rabies, human	–
Yellow fever	–
Ehrlichiosis, human granulocytic*	†
Ehrlichiosis, human monocytic*	‡
Diseases preventable by vaccination	
Hepatitis A	22,028
Hepatitis B	8651
Pertussis	6279
Meningococcal disease	2633
Haemophilus influenzae, invasive disease	1023
Mumps	606
Rubella	345
Measles	89
Tetanus	34
Congenital rubella syndrome	6
Diphtheria	1
Poliomyelitis	1
Enteric diseases	
Salmonellosis	41,999
Shigellosis	22,042
Cryptosporidiosis*	3111
Escherichia coli O157:H7 infection	2939
Typhoid fever	327
Botulism	116
Hemolytic uremic syndrome, postdiarrheal*	82
Cholera	12
Cyclosporiasis*	‡
Sexually transmitted diseases	
Chlamydia trachomatis, genital infections	593,097
Gonorrhea	345,087
AIDS	46,311
Syphilis	37,563
Congenital syphilis	688
HIV infection, pediatric*	262
Chancroid	188
Respiratory and other infectious diseases	
Tuberculosis	14,756
Hepatitis C/non-A, non-B	4840
Coccidioidomycosis*	2397
Streptococcal disease, invasive group A	2067
Legionellosis	1327
Toxic-shock syndrome	132
Hansen disease (leprosy)	105
Streptococcal toxic shock syndrome	49
Streptococcus pneumoniae, drug-resistant invasive disease	‡

**Reportable in fewer than 45 states.*
†No reported cases.
‡Recently made nationally notifiable; data not yet available.

Burden of Reporting

Providers and plans are understandably concerned about the burden of reporting an increasing number of infectious diseases to public health authorities. To avoid duplication of data entry and to make efficient use of health plans' clinical and administrative information systems, we need to work with health plans to ensure direct reporting from their laboratory data systems to public health agencies and to devise mechanisms for obtaining inpatient and outpatient data for surveillance purposes directly from their administrative data systems. Many states (such as California, Hawaii, Massachusetts, Minnesota, Missouri, Oregon, and Washington) are already conducting pilot studies directed toward achieving these goals.

Patient Confidentiality

Providers and plans may be apprehensive about sharing computerized patient records with outsiders. However, to do their job of protecting the health of the public, local public health agencies routinely have access to sensitive personal information, such as data on sexually transmitted disease contacts or sexual or other risk factors for disease. The public health community has an excellent history of safeguarding patient confidentiality and using these data exclusively for public health purposes. Without such information, public health officials cannot track persons at risk for disease and thus prevent further spread of illness.

Fear of loss of confidentiality has been used as an argument against sharing electronic medical data for public health purposes. However, electronic information systems can make medical data even more secure than they are in paper-based medical records.[15] We must reassure the public that we protect the confidentiality of the data we gather, and we must make the case that these data are essential for preventing the occurrence and spread of disease. Both managed care and public health organizations are concerned with population-based health—perhaps together we can show the public the value of medical records for both clinical research and public health practice.

Health Plan Confidentiality

Some health plans may fear that data will be used to measure their performance against that of other plans, particularly with regard to items not entirely under their control, such as disease incidence. We need to reassure plans that public health surveillance is not a regulatory function and that our purposes in conducting surveillance are to monitor the public health and to identify opportunities for improving community health status. Furthermore, data shared with public health organizations can be used only by public health officials to identify problems or priorities and to take public health action. They cannot be shared with secondary users except under conditions that guarantee confidentiality (e.g., summary cases can be reported in the *MMWR*). We hope to build trusting partnerships that facilitate timely and mutually beneficial sharing of data between managed care organizations and public health agencies.

Public Health Agency Concerns about Data from Providers and Plans

Those of us in the public health community have two primary concerns about the infectious disease data that are generated by health care providers and plans.

Decreased Diagnostic Testing

Some public health officials worry that because of pressure to cut costs, fewer diagnostic tests will be done by physicians (especially those paid under capitation) and less information will be available about potentially problematic infectious diseases.[16] However, a 1998 survey done by the Lewin Group for the American Society of Microbiology[17] found that the volume of laboratory testing has increased for nearly all types of tests. Public health officials need to work with providers and plans to evaluate concerns about decreased testing. Through pilot studies, we are working with plans to determine the quality, accuracy, and availability of data on infectious diseases. General concern about health care costs may mean that the use of diagnostic testing is no different among providers in health plans than among other providers. Through partnering with plans, we have the ability to gather information on testing (e.g., the proportion of stools from patients with gastroenteritis that are submitted for culture). If we find that diagnostic testing is being underused, partnerships between public health laboratories and health plans may help ensure that the needed testing is performed.

Underreporting

Physicians and other health care providers often do not report diseases to the local health department. Some diseases that cause severe clinical illness (e.g., plague and rabies) are probably reported accurately once they are diagnosed. However, persons with diseases that are clinically mild and infrequently associated with serious consequences (e.g., salmonellosis) might not seek medical care from a health care provider. Even if these diseases are diagnosed, they are less likely to be reported. Underreporting occurs because, in general, few health care providers understand the importance of public health surveillance, the role of the provider as a source of data, and the role of the health department in response. Many providers do not know how or to whom to report

diseases. Some of this lack of understanding is due to the failure of public health agencies to provide feedback on how data are used or to make data available to providers or other potential users of the data.

How Providers and Plans Can Help

Collaboration among providers, plans, and the public health community will enhance opportunities for disease prevention. Health plans have communication systems that public health officials can use to collect data and to explain the importance of disease surveillance in patient care. The public health community has extensive experience both in conducting population-based surveillance and in responding to public health problems. Health plans have the ability to implement programs on the basis of the information gathered by the public health community. CDC can monitor the effectiveness of these programs through its ability to combine data from multiple states or multiple sources. A close collaboration among providers, plans, and the public health community is essential for effective collection and dissemination of infectious disease surveillance data and to implementation of relevant actions. Both public health and managed care organizations can benefit by sharing data and working together. Here is how providers and plans can help.

Providers

- Find out what diseases are currently reportable in your state (see the **Appendix** for the contact numbers of the office of your State Epidemiologist).
- Report diseases to the state or local health department, as appropriate.
- Report unusual occurrences or increases in incidence of disease.

Plans

- Develop relationships with your health departments.
- Encourage providers to report diseases to the appropriate health departments.
- Facilitate reporting by distributing educational materials, telephone numbers, and reporting forms from the health department to providers.
- Consider implementing contractual requirements necessitating that providers and laboratories report to the appropriate health departments.

Future Work

To obtain a more comprehensive and more accurate depiction of old or emerging public health problems, we must expand the sources of data on infectious diseases. To do this, we are reaching out to new partners and are looking for new information systems that can provide surveillance data. We want to ensure that the evolving standards for computer-based patient records facilitate the exchange of data with public health agencies. At the same time, health plans are tackling the challenging task of building large data systems to more efficiently care for enrolled populations and to provide information for the Health Plan Employer Data Information Set (HEDIS). We hope to work with plans to combine these data and evaluate changes in the incidence of infectious diseases, detect emerging diseases, determine the quality of diagnoses, and take timely action to prevent the spread of disease. We consider health plans to be among our critical partners, and we want to broaden the partnerships and pilot studies that we have already started in various states and at the national level.

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Correspondence

Denise Koo, MD, MPH, Division of Public Health Surveillance and Informatics, Epidemiology Program Office, Centers for Disease Control and Prevention, Mailstop C-08, 1600 Clifton Road, NE, Atlanta, GA 30333; telephone: 404-639-3077; fax: 404-639-4088; e-mail: dxk1@cdc.gov.

(*continued on the next page*)

APPENDIX

Telephone and Fax Numbers for the Office of the State Epidemiologist

STATE	PHONE NUMBER	FAX NUMBER
Alabama	334-206-5340	334-206-5967
Alaska	907-269-8000	907-562-7802
Arizona	602-230-5820	602-230-5818
Arkansas	501-661-2597	501-280-4090
California	510-540-3503	510-540-2570
Colorado	303-692-2662	303-691-7702
Connecticut	860-509-7995	860-509-7910
Delaware	302-739-3033	302-739-6617
District of Columbia	202-645-5572	202-645-4533
Florida	850-922-2203	850-922-9299
Georgia	404-657-2588	404-657-2686
Hawaii	808-586-4586	808-586-4595
Idaho	208-334-5939	208-332-7346
Illinois	217-785-7165	217-557-4049
Indiana	317-233-7807	317-233-7378
Iowa	515-281-4941	515-281-4958
Kansas	785-296-6536	785-291-3775
Kentucky	502-564-7243	502-564-4553
Louisiana	504-568-5005	504-568-5006
Maine	207-287-5301	207-287-8186
Maryland	410-767-6031	410-669-4215
Massachusetts	617-983-6550	617-983-6925
Michigan	517-335-8024	517-335-9476
Minnesota	612-676-5414	612-676-5743
Mississippi	601-960-7725	601-354-6061
Missouri	573-751-6128	573-526-4102
Montana	406-444-3986	406-444-2606
Nebraska	402-471-0050	402-471-0383
Nevada	702-687-4800	702-687-4988
New Hampshire	603-271-4477	603-271-4933
New Jersey	609-588-7535	609-588-7462
New Mexico	505-827-0006	505-827-0013
New York (Albany)	518-474-1055	518-473-2301
New York (New York City)	212-788-4711	212-964-0472
North Carolina	919-733-3419	919-733-0490
North Dakota	701-328-2694	701-328-1412
Ohio	614-466-0302	614-644-7740
Oklahoma	405-271-3266	405-271-6680
Oregon	503-731-4023	503-731-4082
Pennsylvania	717-787-3350	717-772-6975
Rhode Island	401-277-2577	401-272-3771
South Carolina	803-737-4165	803-737-3979
South Dakota	605-773-3361	605-773-5683
Tennessee	615-532-8492	615-741-3857
Texas	512-458-7729	512-458-7229
Utah	801-538-6191	801-538-9923
Vermont	802-863-7340	802-865-7701
Virginia	804-786-6029	804-786-1076
Washington	360-236-4240	360-236-4245
West Virginia	304-558-5358	304-558-6335
Wisconsin	608-267-9003	608-266-2906
Wyoming	307-777-5596	307-777-5402

Telephone and Fax Numbers for the Territorial Epidemiologist

Agana, Guam	011-671-735-7299	011-671-734-5910
Puerto Rico	787-274-7605 or 5224	787-250-6547
Pago, American Samoa	011-684-683-2732	011-684-633-1869
Virgin Islands	809-774-0117	809-777-4001