ILLINOIS DEPARTMENT OF PUBLIC HEALTH

Illinois Infectious Disease Report

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Foodborne Outbreaks in Illinois

By Connie Austin, D.V.M., M.P.H., Ph.D.

The Illinois Department of Public Health (IDPH) and local health departments around the state investigated more than 100 possible foodborne or waterborne outbreaks in 2002. Ninety-one were classified as foodborne outbreaks; 24 outbreaks were laboratory confirmed; 38 outbreaks were characteristic of a particular foodborne pathogen; and 29 outbreaks were of unknown origin.

The most common pathogen group causing foodborne outbreaks are viruses. Norovirus, the most common pathogen identified, was the causative agent in 10 confirmed outbreaks involving an estimated 432 ill persons. In seven of these 10 outbreaks, restaurants were implicated as the source including three where foodhandlers reported illnesses. Norovirus was suspected as the cause in an additional 26 outbreaks. Norovirus outbreaks often result from the handling of food by infected foodhandlers. Sewage contamination of food also could result in norovirus outbreaks.

Among foodborne outbreaks caused by bacterial pathogens, *Salmonella* was the cause of six confirmed outbreaks in 2002. A *Salmonella* outbreak in January caused 110 restaurant patrons to become ill including 36 who were hospitalized. The *Salmonella enterica* serotypes involved in the six outbreaks were Enteritidis (3), Heidelberg (2) and Newport (1). *Escherichia coli* (*E. coli*) O157:H7 accounted for three outbreaks in 2002. A November outbreak of *E. coli* O157:H7 occurred among 13 Illinois residents and 12 residents from three other states. Through pulsed-field gel electrophoresis (PFGE) subtyping and epidemiologic investigation, a restaurant chain and food source was implicated. There were three outbreaks attributed to *Clostridium perfringens*, and one outbreak was caused by *Shigella sonneii*. Although *Bacillus cereus* and *Staphylococcus aureus* were suspected in several outbreaks, none were laboratory confirmed. There were no foodborne outbreaks caused by parasitic agents reported to IDPH in 2002.

Ammonia was the cause of one foodborne outbreak that involved 157 ill persons. Most of the cases (81 percent) had onset of illness within only 60 minutes of eating, a feature characteristic of heavy metal and chemical ingestion. Stomach ache and headache were the most common symptoms reported. A liquid ammonia spill from an air conditioning unit had contaminated chicken that was served at two schools for lunch. Laboratory testing of chicken after the outbreak showed significant levels of ammonia.

Through December 15, 2003, IDPH and local health departments investigated 68 possible foodborne and waterborne outbreaks. Of those outbreaks, 17 were laboratory confirmed. One of these caused by *Salmonella enterica* serotype Javiana involved primarily a single restaurant of a popular restaurant chain. Another, caused by *Salmonella enterica* serotype Newport, was part of a national outbreak and was associated with melon consumption. Many of the Illinois cases were in a nursing home.

Health care providers are encouraged to report suspicion of foodborne outbreaks to their local health department. A health care provider may identify a possible foodborne outbreak when a cluster of persons is seen with gastrointestinal illness or when the symptoms in an individual are typical of foodborne agents (such as scombroid and ciguatera).

When persons become ill after attending an event or meal at a restaurant, they often share this information with others such as household members, friends or a healthcare provider. However, if this information does not get reported to local health departments (or IDPH) then public health activities, that can interrupt further spread of disease may be delayed or not performed. Individual cases (not recognized by the healthcare provider as part of an outbreak) are also reportable when they are caused by one of the notifiable infectious disease agents such as *E. coli* O157:H7, *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia enterocolitica*, cyclospora, and Cryptosporidium. Health care providers also can assist the local health department by performing appropriate diagnostic testing such as sending

stool for enteric pathogens testing. The use of appropriate collection methods for human specimens is very important to increase the yield of this testing.

Definitive diagnostic testing is very important in confirming an outbreak and may help with identifying an outbreak strain, especially for bacterial pathogens. The lack of laboratory confirmed cases can make linking a specific food source much more difficult because isolates from human cases may need to be compared with isolates from food or even from animals or the environment. Incubation period, duration and symptoms of cases may identify likely pathogens, which helps in determining appropriate specimen collection. For instance, norovirus typically causes a short duration illness with an incubation period of 24 to 48 hours and with symptoms of vomiting and diarrhea. Stool for viral testing should be collected in a clean container (such as a urine collection container). Specimens for bacterial testing should be collected in Cary Blair containers. The IDPH laboratory provides free testing of clinical specimens for the purpose of outbreak investigation. At the IDPH laboratory, molecular typing can be used to assist in outbreak investigation. For example, Salmonella serotyping and *E. coli* O157:H7 pulsed-field gel electrophoresis subtyping are very useful in identifying clusters of cases that may not be geographically linked. The IDPH laboratory also has access to a national database of PFGE patterns with linking local sporadic cases to national outbreaks. These tools also assist in ruling out cases that are not associated with an outbreak. Such laboratory information focuses the epidemiologic investigations and assists in the control of outbreaks. Local health departments are responsible for outbreak investigations in their jurisdiction with assistance as needed from the state health department and the CDC.

Testing of foods is only performed at the IDPH lab in response to an outbreak, *not* an individual case of disease. Testing must be requested first through the IDPH Communicable Disease section or Division of Food, Drugs and Dairies.

There are many ways to help prevent foodborne outbreaks. Foodhandlers with diarrhea should not work while ill. Food should be maintained at proper temperatures before serving, purchased from safe sources and cooked to appropriate temperatures. In some jurisdictions, a single complaint of illness associated with a food establishment will result in the local health department inspecting that facility and ensuring that the establishment is compliant with local food safety codes.

What is the Legal Basis for Communicable Disease Reporting?

By Lee Ann Schoeffel, J.D.

The legal authority to require communicable disease reporting arises from broad statutory powers of the Illinois Department of Public Health (IDPH). IDPH has general supervision of the interests of the health and lives of the people of Illinois [1]. IDPH may delegate its duties to county and multiple-county boards of health [2], and it has broad rule-making authority for the preservation and improvement of the public health [3]. IDPH is required to investigate the causes of and to take means to restrict and suppress dangerously contagious or infectious diseases [4]. Although rarely needed, if a local board of health or local authorities should neglect or refuse to enforce efficient measures to restrict or suppress such disease, or neglect or refuse to act with sufficient promptness or efficiency, IDPH may enforce such measures as it deems necessary to protect the public health [5].

IDPH has adopted the Control of Communicable Diseases Code [6]; the Control of Sexually Transmissible Diseases [7]; and the Control of Tuberculosis Code [8], which require that reporting entities report diseases and conditions to local health departments who, in turn, report the same to IDPH [9]. The Illinois Communicable Disease Report Act provides that reports of communicable disease made pursuant to State statute or local ordinance shall be confidential, and provides immunity from suit for slander or libel to medical practitioners or other persons who make reports in good faith [10].

The Control of Communicable Diseases Code itself does not mention any consequence for failing to report communicable diseases. However, Section 8.1 of the Department of Public Health Act states, "whoever violates or refuses to obey any rule or regulation of the Department of Public Health shall be deemed guilty of a Class A misdemeanor [11]." Because the provisions of the Control of Communicable Diseases Code are administrative rules of the Department of Public Health, a violation of such a rule constitutes a Class A misdemeanor. A Class A misdemeanor is punishable by a maximum fine of $2,500 and less than one year imprisonment.

Section 8.1 of the Department of Public Health Act provides that the Director of Public Health shall institute prosecutions and proceedings for violation of such rules and regulations, or he may designate a local board of health or local health officer to institute prosecutions or proceedings for such violations [12]. Each State's Attorney shall prosecute all persons in his county violating or refusing to obey the rules and regulations of IDPH [13].

It is important to emphasize that the HIPAA Privacy Rule does not adversely affect the Department's ability to receive or access protected health information from covered entities such as health care providers and health care professionals. The HIPAA Privacy Rule allows covered entities to provide to public health authorities information about an individual exposed to a communicable disease, or who may otherwise be at risk of contracting or spreading a disease or condition. This includes protected health information necessary for public health surveillance, investigation and interventions [14].

Reporting Entities and Manner of Reporting: It shall be the duty of each of the following persons or any other person having knowledge of a known or suspected case or carrier of communicable disease or communicable disease death, to report within the time frames set forth in Section 690.100 of this Part (except for sexually transmissible diseases that are reportable under the Control of Sexually Transmissible Diseases Code (77 Ill. Adm. Code 693) and tuberculosis, which is reportable under the Control of Tuberculosis Code (77 Ill. Adm. Code 696)) the case, suspected case, carrier or death.

Physicians	Laboratory Personnel
Nurses	School Personnel
Nurses Aides	Long-term Care Personnel
Dentists	Daycare Personnel
Healthcare Practitioners	College and University Personnel

References:

1. 20 Illinois Compiled Statutes 2305/2; 20 ILCS 2310/2310-15 (West 2002).
2. 20 Illinois Compiled Statutes 2310/2310-15 (West 2002).
3. 20 Illinois Compiled Statutes 2305/2 (West 2002).
4. 20 Illinois Compiled Statutes 2305/2 (West 2002).
5. 20 Illinois Compiled Statutes 2305/2 (West 2002).
6. 77 Illinois Administrative Code 690.
7. 77 Illinois Administrative Code 693.
8. 77 Illinois Administrative Code 696.
9. 77 Illinois Administrative Code 690.100.
10. 745 Illinois Compiled Statutes 45/1 (West 2000).
11. 20 Illinois Compiled Statutes 2305/8.1 (West 2002).
12. 20 Illinois Compiled Statutes 2305/8.1 (West 2002).
13. 20 Illinois Compiled Statutes 2305/8.1 (West 2002).
14. 45 Code of Federal Regulations 164.512 (a), (b) (1) (i)

Links to Information about Waterborne Infectious

By Michele McGee, M.P.A.

The purpose of this Physician On-Line Reference Guide is to provide busy practicing healthcare providers and local health departments with informational resources and educational tools to assist them in the recognition of waterborne disease and the health effects of water pollution.

http://www.waterhealthconnection.org/
Source: Water Health Connection

http://www.cdc.gov/ncidod/diseases/list_waterborne.htm
Source: CDC

http://www.postgradmed.com/issues/2000/04_00/prier.htm
Source: Post Graduate Medicine Online

://www.health.state.mn.us/divs/eh/wells/bactiweb.html
Source: Minnesota Department of Health

http://www.microbeworld.org/htm/cissues/waterq/wqual_0.htm
Source: Microbe World

Factoid Ebola Hemorrhagic Fever: Outbreaks in resource poor settings in Africa have been controlled with basic infection control precautions such as gowns, gloves and eye protection. Neither vaccine nor chemoprophylaxis are available for this disease and despite their absence, infection control precautions have been sufficient. Control of Ebola outbreaks using infection control measures have even been successful in hospitals where staff had not received salaries for months, the hospitals lacked running water and electricity, and no functional waste disposal system or latrines existed. This example underscores how important and effective appropriately carried out infection control measures can be in disease control.

Reference: Kerstiens B, Mattys F, Intervention to control virus transmission during an outbreak of Ebola Hemorrhagic Fever: Experience from Kikwit, Democratic Republic of the Congo, 1995. Journal of Infectious Diseases 1999; S263-S267.

Surveillance Is Information for Action!

By Gregory Huhn, M.D., M.P.H.T.M.

Q: What public health action is triggered when a histoplasmosis case is reported to the local health department?

A: Histoplasmosis is endemic in the Mississippi and Ohio River Valleys. In Illinois, the five-year median for annually reported cases from 1996 to 2000 was 43 cases (range 27 to 60 cases). Since 2001, two outbreaks of occupationally acquired histoplasmosis have been identified in Illinois. In May 2001, eight employees at a landfill site in Macon County were diagnosed with acute pulmonary histoplasmosis and in August 2003, six cases of acute pulmonary histoplasmosis were reported among laborers at a bridge reconstruction site in Iroquois County. Figure 1 provides a small map with these two counties.

Histoplasmosis is a notifiable disease in Illinois. A case is defined as a person with either 1) acute onset of influenza-like symptoms and isolation of *Histoplasma capsulatum* from a clinical specimen or 2) influenza-like symptoms, hilar adenopathy and /or patchy infiltrates on chest radiographs (if done) and at least one of the following a) M or H precipitin bands positive by immunodiffusion, b) a four-fold rise between acute and convalescent complement fixation (CF) titers, c) a single CF titer > 1:32, d) demonstration of histoplasma polysaccharide antigen by radioimmunoassay (RIA) in blood or urine, or demonstration of organisms by silver staining blood specimens or biopsy material.

For all cases of persons diagnosed with histoplasmosis, an Illinois Department of Public Health (IDPH) Systemic Mycoses (Blastomycosis and Histoplasmosis) Case Report Form should be completed by the local health authority or infection control personnel. Case report forms are reviewed by the IDPH Communicable Disease Control Section and if further investigation is warranted, for example in an outbreak setting, a more specific questionnaire is developed to interview cases to better understand risk factors for transmission. Diagnostic testing including culture, serology, and measurement of urine histoplasma antigen may be facilitated by IDPH. If an outbreak is suspected, an environmental investigation is performed by local and/or state health department personnel to assist with determination of the most appropriate control measures to interrupt potential further transmission. Inhalation of aerosolized H. capsulatum spores is the usual route of transmission. These spores may be found in bat droppings and soil enriched by bird or bat droppings. The following control measures are typically considered during a histoplasmosis outbreak:

- Avoidance of areas that may harbor the fungus, particularly those areas with accumulations of bird or bat droppings.
- Minimizing exposure to dust suspected or confirmed to be a source of histoplasmosis by spraying with a mist of water before working in the potentially contaminated site.
- Recommending that all persons working in high-risk areas wear disposable clothing and a face mask capable of filtering out particulate matter above 1 millimicron in diameter. (*H. capsulatum* spores are 2-3 microns in diameter).

More detailed information on preventive histoplasmosis recommendations may be found on the CDC Web site, <http://www.cdc.gov/ncidod/dbmd/diseaseinfo/histoplasmosis_g.htm>, and through the manual *Histoplasmosis, Protecting Workers at Risk*, U.S. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH), September 1997, available on the NIOSH Web site, <http://www.cdc.gov/niosh/tc97146.html>.

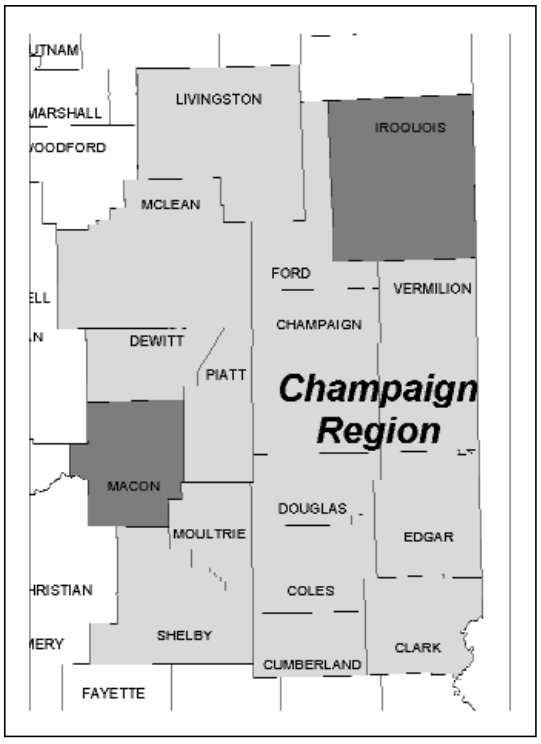

Fig. 1

Death During Treatment of Tuberculosis

By Anne McIntyre, M.P.H., Ph.D. (c)

Worldwide, more than 8 million people become infected with tuberculosis (TB) and 2 million die from the disease each year (1). While case rates have been steadily declining over the past century, TB remains an important public health issue, especially in countries with high rates of HIV/AIDS. In the United States, more than 68,000 cases were reported and more than 3,500 (approximately 5.1 percent) deaths were attributed to TB during 1998-2001 (2). Nationally, 749 (4.7 percent) of 15,989 reported cases died during anti-TB treatment during 2001. In comparison, 42 (7.4 percent) of 568 reported cases in Illinois died during anti-TB treatment during 2001.

We examined factors associated with mortality while on anti-TB therapy by reviewing data from the Illinois TB case registry collected during 1998 through 2001. Univariate and bivariate analyses were performed to evaluate factors associated with likelihood of death during anti-TB therapy.

There were 3,108 cases of TB reported in Illinois during 1998 through 2001. Cases that stopped therapy for reasons other than completion of treatment or death (i.e., subject was lost to follow up, moved, or refused treatment) were excluded from the analysis (n=420 [13.5 percent of all reported TB cases]). Among the 2,688 cases analyzed, there were 277 (10.3 percent [8.9 percent of all reported TB cases]) with death recorded as the reason for stopping anti-TB treatment and 2,411 (89.7 percent [77.6 percent of all reported TB cases]) that completed therapy. Selected results of the analyses are shown in Table 1.

Overall, the median age at report was 44 years (range 0-109 years). Of the cases included in the analysis, 1,592 (59.2 percent) were male, 1,113 (41.4 percent) were African American, and 1,741 (64.8 percent) were of U.S. origin. Compared to cases that completed therapy, cases that died were significantly older (67 vs. 42 years, $p<0.01$) and more likely to be of U.S. origin (Odds Ratio [OR] 2.5, 95 percent confidence interval [CI] 1.8-3.4), a resident of a long-term care facility at the time of diagnosis (OR 6.2, 95 percent CI 3.9-9.7), HIV-infected (OR 4.1, 95 percent CI 2.6-6.5), have a private health care provider (OR 10.6, 95 percent CI 7.2-15.6) or a combination of private and public providers (OR 2.9, 95 percent CI 1.8-4.8), have self-administered therapy (OR 2.1, 95 percent CI 1.6-2.8), and have been prescribed a non-standard initial drug regimen such as one- or two-drug therapy (OR 2.4, 95 percent CI 1.8-3.3).

Cases who were previously diagnosed with TB, a resident of a correctional facility at the time of diagnosis, or had a history of homelessness, injecting drug use, non-injecting drug use or excessive alcohol use within the year prior to diagnosis, were not more likely to die while on anti-TB therapy than to complete treatment. These preliminary results are consistent with the limited available published literature on death during the treatment of tuberculosis (3). Additional statistical analysis is planned.

The percentage of deaths during TB treatment in Illinois (7.4 percent) was higher than a national (4.7 percent) estimate for 2001. These data demonstrate several populations are at higher risk for death during TB therapy including HIV-infected persons, long-term care facility residents, and those with private providers. While these data do not explain exactly why Illinois has a higher mortality rate than the national average, they do suggest that further investigation into this issue is warranted. A higher rate of deaths during treatment of tuberculosis may be a function of better morbidity and mortality data collection, different provider referral patterns to TB care specialists and local health departments, or different demographics and risk factors (i.e., the Illinois population of TB cases might be older and sicker) than other states. The results underscore the importance of referral to public health authorities with experience in tuberculosis treatment and help direct possible future studies and prevention activities directed at reducing mortality from TB in Illinois.

References:
1. World Health Organization. Tuberculosis Fact Sheet Number 104. August 2002.<http://www.who.int/mediacentre/factsheets/who104/en/index.html>
2. Centers for Disease Control and Prevention. Reported Tuberculosis in the United States, 2002. Atlanta, GA: U.S. Department of Health and Human Services, CDC, September 2003. <http://www.cdc.gov/nchstp/tb/surv/surv2002/PDF/T1.pdf>
3. Fielder JF, Chaulk CP, Dalvi M, et al. A high tuberculosis case-fatality rate in a setting of effective tuberculosis control: implications for acceptable treatment success rates. Int J Tuberc Lung Dis 2002;6(12):1114-1117.

Table 1: Characteristics of 2,688 TB cases and association with dying while on anti-TB treatment in Illinois, 1998-2001.*

	Total Reported Cases (%) (N=2688)	Death During Treatment (%) (n=277)	Completed Treatment (%) (n=2411)	Crude Odds Ratio (95% CI)	p-value
Year of Report					
1998	728 (27.1%)	72 (26.0%)	656 (27.2%)	Referent	
1999	731 (27.2%)	91 (32.9%)	640 (26.6%)	1.30 (0.92, 1.82)	0.121
2000	661 (24.6%)	72 (26.0%)	589 (24.4%)	1.11 (0.78, 1.60)	0.540
2001	568 (21.1%)	42 (15.1%)	526 (21.8%)	0.73 (0.48, 1.10)	0.116
Age (in years) at Report					
Median (Range)	44.0 yrs (0-109)	67.0 yrs (20-102)	42.0 yrs (0-109)		
Male	1592 (59.2%)	172 (62.1%)	1420 (58.9%)	1.23 (0.94, 1.61)	0.135
Race/Ethnicity					
White Non-Hispanic	557 (20.7%)	70 (25.3%)	487 (20.2%)	Referent	
Black Non-Hispanic	1113 (41.4%)	143 (51.6%)	970 (40.2%)	1.03 (0.75, 1.41)	0.871
Hispanic	468 (17.4%)	29 (10.5%)	439 (18.2%)	0.46 (0.29, 0.74)	<0.001
Native American	18 (0.7%)	5 (1.8%)	13 (0.5%)	2.68 (0.81, 8.38)	0.072
Asian	526 (19.6%)	29 (10.5%)	498 (20.7%)	0.41 (0.25, 0.65)	<0.001
Country of Origin					
US	1741 (64.8%)	224 (80.9%)	1517 (62.9%)	Referent	
Foreign	943 (35.1%)	51 (18.4%)	893 (37.0%)	0.40 (0.29, 0.55)	<0.001
Long term care facility resident	103 (3.8%)	41 (14.8%)	62 (2.6%)	6.18 (3.93, 9.71)	<0.001
HIV Status					
Negative	807 (30.0%)	52 (18.8%)	755 (31.3%)	Referent	
Positive	195 (7.3%)	43 (15.5%)	152 (6.3%)	4.11 (2.58, 6.52)	<0.001
Unknown	1686 (62.7%)	182 (65.7%)	1504 (62.4%)	1.76 (1.26, 2.45)	<0.001
Health Care Provider type					
Public Provider	1300 (48.4%)	35 (12.6%)	1265 (52.4%)	Referent	
Private Provider	857 (31.9%)	194 (70.0%)	663 (27.5%)	10.58 (7.19, 15.62)	<0.001
Combination of Public and Private Providers	509 (18.9%)	38 (13.7%)	471 (19.5%)	2.92 (1.78, 4.79)	<0.001
Directly Observed Therapy (DOT)	**1399 (52.0%)**	**97 (35.0%)**	**1302 (54.0%)**	Referent	
Both directly observed and self-administered	334 (12.4%)	33 (11.9%)	301 (12.5%)	1.47 (0.95, 2.27)	0.066
Only self-administered	921 (34.3%)	124 (44.8%)	797 (33.1%)	2.09 (1.56, 2.79)	<0.001
Duration (in weeks) of Directly Observed Therapy (DOT)					
Median (Range)	26.0 weeks (0-132)	6.0 weeks (0-132)	26.0 weeks (0-87)		

*Some percentages do not equal 100% due to rounding or missing data.

Upcoming Events

National STD Prevention Conference
Philadelphia Marriott Hotel
March 8-11, 2004
More information:
www.stdconference.org

Illinois Immunization and Communicable Disease Conference
Crowne Plaza Hotel and Conference Center
Springfield, Illinois
June 15 and 16, 2004
More information:
Illinois Public Health Association
217-522-5687 or ipha@ipha.com

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