EPI-LOG

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- **Foodborne Illness Surveillance: How do we Identify and Prevent Foodborne Illnesses and Outbreaks?**
- **Clinical Cases: Food Safety for Special Populations**

Foodborne Illness Surveillance: How do we identify and Prevent Foodborne Illnesses and Outbreaks?

In the United States there are approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths due to foodborne illness per year. More than 200 diseases are known to be transmitted through food. Between 2003 and 2007, Public Health-Seattle & King County received 583 to 766 complaints of suspected foodborne illness each year (average 681).

King County conducts ongoing surveillance for foodborne illness in order to 1)identify commercial foods that are a source of illness so that they can be removed from the food supply, 2) identify and rectify food handling practices in licensed food service facilities that contribute to foodborne illness, and 3) identify opportunities to educate citizens on prevention of foodborne illness. In King County, foodborne illness surveillance is conducted using two sources of data: reports received from health care providers and labs, and complaints reported predominantly by citizens.

Notifiable Enteric Infection Reporting is Key

Legally notifiable laboratory diagnosed enteric infections, including salmonellosis, shigellosis, campylobacteriosis, giardiasis, cryptosporidiosis, yersiniosis, enterohemorrhagic *E. coli*, hepatitis A, and vibriosis reported by HCPs and labs is the backbone of our foodborne illness surveillance. Not all of these infections are spread only through food; depending on the organism, some can be transmitted person to person, via animal contact, via water, etc. When a diagnosed enteric infection is reported, Public Health investigators interview the case-patient about risk factors during the exposure period specific to that infection, including foods consumed at home and at restaurants, animal contact, recreational water exposure, other ill people in the home or workplace, etc. During the interview, if food from a licensed facility is identified as the possible source of the infection, it is entered into the suspected foodborne illness complaint system (see following section).

Citizen Foodborne Illness Complaints are Essential

The second source of data is the suspected foodborne illness complaint reporting system used primarily by citizens. These on-line and telephone reports can represent a single ill eater or an entire party who became ill after sharing a meal. For complaints where two or more people from different households or three or more complaints from the same household, all parties (both ill and non-ill) who ate the suspected meal are interviewed about the time of the meal, foods eaten, symptoms, other meals shared among ills in the previous week, and other recent illnesses in the home or workplace. Other information collected includes the incubation period between the suspected meal and symptom onset, duration of illness, and whether there was secondary transmission.

Based on the information collected during the investigation and the restaurant inspection history, an assessment is made whether the illness could plausibly be related to the facility in question. Complaints that are not plausibly associated with the facility are classified as “unlikely” and are not investigated further. Larger clusters of foodborne illness (>10 people, or so) typically spawn a retrospective cohort investigation in which an outbreak case definition and a standardized questionnaire are used to interview both ill and non-ill persons in a party. This standardized analysis allows us to calculate attack rates and the relative risk of illness associated with each food.

The Role of Environmental Health

Once a licensed facility is identified as a plausible source of foodborne illness, a restaurant inspection is requested through the PHSKC Environmental Health Program. During this targeted inspection, the following information may be requested depending on which pathogen is suspected: food preparation steps for the suspected food, cooking temperatures, food cooling methods, cold and hot holding temperatures, dishwasher temperatures, hand washing facilities, potential for bare hand contact of ready-to-eat foods, sanitizer use, potential for cross-contamination, presence of ill food workers, specimens of food, and source data for food.

Between 2003 and 2007, restaurant inspections were requested for approximately 10 percent of all foodborne illness complaints in King County. Of these, 6 percent (18 to 89—average 43) were classified as a confirmed or probable complaint. A complaint is classified as “confirmed” if there is a positive lab finding in at least one case, in addition to convincing epidemiologic and environmental evidence. A “probable” case is the same as confirmed, but without the laboratory confirmation.

Room for Improvement: HCP Reporting of Suspected Foodborne Illness Clusters

Though clusters of suspected foodborne illness are immediately notifiable by health care providers in Washington State, only a small proportion of suspect foodborne illness reports are received from health care

providers in King County. It is especially helpful when clinicians report these cases because they represent an opportunity to order targeted diagnostic testing and to collect objective clinical information about the cases. In addition, health care providers can also refer individuals who suspect that they may have a foodborne illness to Public Health to make a citizen complaint. **Both clinicians and citizens should report suspected foodborne illness by calling (206) 296-4774.**

Clinical Cases: Food Safety for High-Risk Populations

Case #1: In April, 2008, a 48 year old man undergoing chemotherapy for acute myelogenous leukemia (AML) developed listeriosis and was hospitalized. The family reported that the case-patient regularly consumed *queso fresco* (a soft Mexican cheese) that had been purchased from a door-to-door vendor. A sample of the remaining cheese was tested, and found to be contaminated with *L. monocytogenes*. Pulsed field gel electrophoresis (PFGE) showed that the pattern from the cheese was indistinguishable from the isolate from the case-patient. The patient expired a little over a month after his hospitalization..

Case #2: In September 2008, a 24 year old woman delivered a child prematurely at 29 weeks gestation. Blood cultures from both the mother and child grew *Listeria monocytogenes*. The woman reported consuming *queso fresco* purchased by a friend at a small grocery store. During a previous routine environmental health inspection, the store was cited for selling *queso fresco* from an unapproved source – the cheese had no label or invoice showing that it was produced by a licensed facility. On re-inspection of the store prompted by this case, no unlabeled *queso fresco* was for sale. A sample of cheese from the batch eaten by the case-patient was tested and grew *L. monocytogenes* with a PFGE pattern that was indistinguishable from the isolates of the case-patients. The mother recovered fully but the baby remains hospitalized.

These cases highlight the increased risk of morbidity and mortality from foodborne diseases among immuno-compromised persons. Neither of these patients or their families remember being counseled regarding food safety, or to eat only pasteurized dairy products, and avoid consuming hot dogs, luncheon meats, deli meats, smoked seafood (unless adequately reheated), pate, meat spreads and prepared deli salads because of the danger of listeriosis.

Listeria monocytogenes primarily causes severe disease among persons with weakened immune systems and pregnant women. Listeriosis may present as meningoencephalitis, septicemia, or endocarditis. Maternal infections, which can also be mild or asymptomatic, often result in stillbirth, premature delivery, or neonatal infection.

Clinicians should remember to counsel their high-risk patients regarding listeriosis and other food borne pathogens.

The United Stated Dept. of Agriculture Food Safety and Inspection Service has posted food safety education materials specific to each of the following high risk groups: pregnant women, transplant recipients, people with diabetes, people with cancer, older adults, and those with HIV/AIDS. These materials can be found at:

www.fsis.usda.gov/Fact_Sheets/At_Risk_&_Underserved_Fact_Sheets/index.asp

Disease Reporting

AIDS/HIV..... (206) 296-4645
STDs..... (206) 744-3954
TB ..... (206) 744-4579
All Other Notifiable Communicable Diseases (24 hours a day) .... (206) 296-4774
Automated reporting line for conditions not immediately notifiable..... (206) 296-4782

Hotlines

Communicable Disease ..... (206) 296-4949
HIV/STD..... (206) 205-STDS

Public Health-Seattle & King County

Online Resources

Home Page: www.metrokc.gov/health/
The *EPI-LOG*: www.metrokc.gov/health/providers
Communicable Disease listserv (PHSKC INFO-X) at: mailman.u.washington.edu/mailman/listinfo/phskc-info-x

West Nile Virus Updates and Current Testing Guidelines: www.metrokc.gov/health/westnile/advisories.htm

Reported Cases of Selected Diseases, Seattle & King County 2008

	Cases Reported in August		Cases Reported Through August	
	2008	2007	2008	2007
Campylobacteriosis	30	37	223	161
Cryptosporidiosis	5	10	27	27
Chlamydial infections	456	460	3,918	3,737
Enterohemorrhagic *E. coli* (non-O157)	1	1	2	4
***E. coli* O157: H7**	4	13	19	24
Giardiasis	7	11	74	94
Gonorrhea	121	114	890	999
***Haemophilus influenzae* (cases <6 years of age)**	0	0	2	2
Hepatitis A	0	3	14	10
Hepatitis B (acute)	2	2	26	17
Hepatitis B (chronic)	84	75	608	554
Hepatitis C (acute)	2	1	10	5
Hepatitis C (chronic, confirmed/probable)	136	112	950	914
Hepatitis C (chronic, possible)	29	34	235	203
Herpes, genital (primary)	39	45	357	430
HIV and AIDS (new diagnoses only)	23	46	248	291
Measles	0	0	0	1
Meningococcal Disease	1	1	4	5
Mumps	0	0	1	4
Pertussis	8	2	52	45
Rubella	0	0	0	0
Rubella, congenital	0	0	0	0
Salmonellosis	28	25	144	175
Shigellosis	3	4	31	37
Syphilis	45	23	151	107
Syphilis, congenital	0	0	0	0
Syphilis, late	11	12	57	52
Tuberculosis	12	0	71	84

The *EPI-LOG* is available in alternate formats upon request.

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