

Public Health Update

June 2009

Notifiable Diseases 2008: A Year in Review

This Public Health Update includes brief descriptions of many of the disease outbreaks and large communicable disease control efforts investigated in 2008 by Tri-County Health Department (TCHD) in Adams, Arapahoe and Douglas Counties. In addition, summary numbers of notifiable diseases reported in 2008 in the Tri-County region are presented in a table. A list of notifiable diseases in Colorado and a case report form are included at the end of this update.

Summary of 2008 Cases and Outbreak Investigations

TCHD investigated 624 cases of notifiable diseases in 2008 (these numbers do not include sexually-transmitted diseases or influenza). Of the 624 case investigations, 182 were in **Adams County**, 303 were in **Arapahoe County** and 139 were in **Douglas County**. In 2008, TCHD also conducted a total of 69 outbreak investigations throughout our 3 counties, a 50% increase from 2007. Of the 69 outbreaks, 19 were in **Adams County**, 39 in **Arapahoe County** and 11 in **Douglas County**. Furthermore, of the 69 outbreaks investigated in 2008, 43 were in long term care facilities, 13 were associated with restaurants, 12 were in child care centers, and 1 was in the "other" category. Below are brief descriptions of some of the more notable outbreak and case investigations that TCHD conducted in 2008.

Increase in outbreaks of gastrointestinal illness in long term care facilities

In 2008, of the 43 outbreaks that occurred in Long Term Care Facilities (LTCF) in the Tri-County region, 36 were due to gastrointestinal illnesses. Of these 36 outbreaks, 12 were in **Adams County**, 23 were in **Arapahoe County**, and 1 was in **Douglas County**. This was an unusually high number of gastrointestinal LTCF outbreaks compared to prior years; there were only 20 gastrointestinal LTCF outbreaks in 2006 and 17 in 2007. Most of the 2008 outbreaks were consistent with viral gastroenteritis. However, in six of the outbreaks both *Clostridium difficile* and norovirus were detected among LTCF residents, some of whom were co-infected with both organisms.

Noroviruses (also known as Norwalk-like viruses, caliciviruses, and small round structured viruses) cause acute gastroenteritis. Acute-onset vomiting, watery non-bloody diarrhea, abdominal cramping and nausea are the most common symptoms. The virus has a low infectious dose (< 100 viral particles), which allows for easy spread. Transmission is primarily person-to-person via the fecal-oral route and a food handler can contaminate food if they have the virus on their hands. Transmission through aerosolized vomitus, as well as fomite transmission, may also occur. Shedding of norovirus begins with onset of symptoms, and infected persons can be contagious for up to 72 hours **after** symptoms have stopped. Humans are the only known reservoir for these viruses. Norovirus may account for more than 90% of gastroenteritis outbreaks not caused by bacteria or toxins. Outbreaks of norovirus have occurred in many different settings, including restaurants, schools, camps, cruise ships, vacation settings, swimming pools, hospitals and long-term care facilities.

Clostridium difficile is a gram-positive, spore-forming bacterium that is a common cause of diarrhea and colitis in humans and animal, and more serious intestinal conditions such as pseudomembranous colitis, toxic megacolon, perforations of the colon and sepsis. The opportunistic bacteria accounts for 15-25% of



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all episodes of antibiotic-associated diarrhea (AAD) and it is estimated that 5%-7% of long term care facility residents carry *C. difficile*. *C. difficile* spores are shed in the feces and transmission occurs when spores are ingested. Person-to-person transmission occurs primarily via the hands of healthcare personnel who have touched a contaminated surface, but can also occur through contaminated objects or equipment such as: bedrails, thermometers, toilet seats, wheelchairs, and commodes. *C. difficile* spores can survive outside the human body for weeks to months on environmental surfaces and devices. Soil, hay, water and sand are common environmental reservoirs. The risk for disease increases in patients with antibiotic exposure, gastrointestinal surgery or manipulation, a long length of stay in a healthcare setting, a serious underlying illness, immunocompromising condition and advanced age. Outbreaks of *C. difficile* have been reported in both hospitals and long term care facilities.

TCHD worked with each affected LTCF to improve sanitization and handwashing, isolate ill residents and exclude ill staff to minimize the further spread of disease. TCHD also worked with the Director of Nursing and Infection Control personnel of these care facilities to strengthen prevention messages, such as recommending that staff with gastroenteritis stay home until two days **after** the cessation of diarrhea and vomiting, new admissions be halted until four days **after** the cessation of diarrhea and vomiting among residents and staff, and that increased sanitization and handwashing continue for two weeks after the end of the outbreak.

Arapahoe County hantavirus case

In September 2008, TCHD was notified by the Colorado Department of Public Health and Environment (CDPHE) that an **Arapahoe County** resident had been diagnosed with Hantavirus Pulmonary Syndrome (HPS). TCHD immediately conducted a patient interview and determined that a potential source of exposure may have been a defunct dog-racing track. A site visit was conducted at the dog-racing track, in order to identify potential areas conducive to disease transmission and to recommend appropriate measures to prevent and minimize disease risk. The site visit revealed numerous unused buildings, dog kennels, and residential mobile homes (some of which were currently occupied) on approximately 240 acres of rural land. Evidence of habitation by birds, rodents and larger animals, such as animal feces and rodent nests, were observed in all buildings on the property that were inspected. All structures had multiple, easy access points for rodent entry. Some food sources were available around the occupied trailers and dog kennels. However, abundant natural food sources, particularly sunflowers, were present throughout the property. Although no live deer mice (*Peromyscus maniculatus*) were observed, this setting had ample food supply and harborage to support a significant population. Several buildings were closed, such that inspection was only permitted through windows. TCHD did not inspect individual, occupied residences on the property but did provide residents with information on HPS. The ill person fully recovered and TCHD recommended that the defunct buildings on the property be locked up to minimize transmission of HPS.

HPS is a rare but serious illness transmitted by rodents. Humans can contract the disease when they come into contact with infected rodents or their urine or droppings. The deer mouse (*Peromyscus maniculatus*) is the main carrier of hantavirus in the western United States. HPS begins one to six weeks after exposure to the virus. The disease begins with 2-6 days of "flu-like" illness including fever, muscle aches, and fatigue, and sometimes vomiting or headaches. After 4-10 days, patients typically experience cough and shortness of breath due to fluid filled lungs and hospitalization is usually required. Most patients develop some degree of hypotension and progressive pulmonary edema, usually requiring mechanical ventilation; fatality rates can be high. Rodent control remains the primary strategy for preventing hantavirus infection.

E. Coli outbreaks in child care settings

In 2008, TCHD assisted in the control of two outbreaks of *Escherichia coli* (*E. coli*) in child care settings. The first outbreak occurred at a corporate child care center in May 2008. TCHD was notified of increased gastrointestinal illness among students attending this childcare center in **Arapahoe County**. Upon further investigation it was determined that illness was isolated in the toddler, two-year old and four-year old classrooms. The following week, it was determined that three ill children had tested positive for *E.coli*. TCHD then decided that it was necessary to introduce cohorting into the facility. Cohorting, the separation of ill from well, is a technique used to prevent the spread of disease. It was decided that any children who have been symptomatic would be placed in a symptomatic classroom and the others in an asymptomatic classroom. It was necessary to get approval from the Colorado Department of Human Services (CDHS) due to the potential mixing of age categories and possible staff-to-child ratio problems. A total of eight cases tested positive for *E.coli* O157:H7. As recommended by the Colorado Department of Public Health and Environment (CDPHE), TCHD required 2 consecutive negative stool specimens from all symptomatic and asymptomatic children and staff in order to discontinue cohorting in the facility.

The second outbreak occurred at a home child care center in **Arapahoe County** in September 2008. TCHD discovered this outbreak through the routine investigation of a child who tested positive for *E. coli*. The mother of the case reported that the case attended child care and that the child care provider and other children had been ill with similar symptoms. The case died from complications later that day. TCHD followed up with the child care provider and determined that there were several ill children with similar symptoms. TCHD conducted a site visit, provided the child care provider with information about *E. coli*, and obtained contact information for child care attendees. The child care was unlicensed and was immediately ordered to close by CDHS. Further investigation by TCHD revealed that wearing diapers or putting toys in the mouth were statistically significant risk factors for disease among child care attendees. Due to *E. coli* exposure, the child care attendees were not allowed to enroll in any other child care until they submitted two consecutive negative stool specimens. A total of six children tested positive for *E. coli* O157:H7.

E. coli O157:H7 is a bacterium that can be found in raw meats (especially ground beef), unpasteurized milk, unpasteurized juice and contaminated water. Raw meats and raw meat juices can spread the bacteria if they touch ready-to-eat foods (salads, breads, cheeses, etc.), food preparation surfaces and utensils (cutting boards, plates, knives, etc.) or hands. Transmission is primarily person-to-person via the fecal-oral route and a food handler can contaminate food if they have the bacteria on their hands. Symptoms of infection include sudden onset of diarrhea (often bloody), severe stomach pains, fever and vomiting. Symptoms may begin 2-10 days after ingesting the bacteria. Some infected people may remain asymptomatic, but may still be able to shed the bacteria in their feces and spread the bacteria. Improper handwashing after restroom use or diaper changing, followed by handling of food or objects that people put in their mouths (e.g. toys) can facilitate transmission of the bacteria. Young children are at risk for developing hemolytic-uremic syndrome (HUS) and adults are at risk for developing post-diarrheal thrombocytopenic purpura (TTP). Both HUS and TTP can be fatal. Thus, it is important that child care centers work closely with the health department to effectively prevent the spread of infection among child care attendees.

Church Funeral Outbreak

In May 2008, Tri-County Health Department (TCHD) was contacted by the Parish Administrative Assistant (PAA) of a large Catholic Church in **Arapahoe County** who reported that several individuals became ill with diarrhea and/or vomiting after attending a funeral reception. This Catholic Church has a

congregation of 27,000 individuals. Information collected during the initial phone call indicated that there were approximately 1,400 individuals who attended the funeral and approximately 700-1000 individuals who attended the catered reception after the funeral. There was also a vigil that was held the night prior to the funeral. Both events provided food from local restaurants and food prepared at home by individuals who attended the events. TCHD staff conducted an on-site inspection of the facility that catered the funeral reception and all major violations were corrected.

Due to the large numbers of individuals who attended the funeral and its associated events, TCHD decided to survey two defined sub-groups that reported illness after attending the funeral. These two groups included the church choir and a friar group. A study was conducted by combining the two groups. The predominant symptoms reported were nausea (100%), diarrhea (90%), fatigue (90%), vomiting (60%), and fever (60%), which started around 45 hours after attending the funeral.

In our investigation, attending the funeral was associated with an increased risk of illness; although this was not statistically significant. However no particular food items were identified among this cohort. There are several possibilities that may have resulted in contamination of food and ice (e.g., lack of hand washing, improper glove use, and use of a common utensil while serving food). It is possible that the source of illness for both groups was food contaminated by an infected individual who served or prepared the food and beverages. It is also possible that various surfaces and inanimate objects (e.g., serving utensil, table) might have become contaminated with an infectious organism as a result of poor hand hygiene by an infected individual.

DNC-Associated Pertussis Investigations

On August 29, 2008, the day after Democratic National Convention (DNC) wrapped up in Denver, Tri-County Health Department was notified about a case of pertussis in a **Douglas County** resident. The case was an officer with the Denver Sheriff's Department (DSD) and had worked closely with other officers from throughout the state of Colorado during the week-long DNC in Denver. TCHD began an investigation to identify potential contacts who may have been exposed during the DNC, working closely with Denver Public Health and the Jefferson County Department of Health and Environment. The investigation identified several other officers who were symptomatic and/or exposed. Approximately 12 officers received prophylaxis, and TCHD identified 2 additional cases within our jurisdiction. DSD sent a letter to over 200 employees informing them of their possible exposure, and they tested and/or treated another 30.

Pertussis, or whooping cough, is a highly contagious respiratory illness, caused by the bacterium *Bordetella pertussis*. Pertussis-related symptoms can include prolonged, paroxysmal coughing, sometimes accompanied with post-tussive cyanosis and emesis. Infants and young children have the highest incidence of complications, such as pneumonia, seizures, hypoxia, and encephalopathy. Although childhood vaccination has reduced reported pertussis cases, the incidence of the disease has increased over the past 20 years in previously-immunized adolescents and adults. Therefore, the Centers for Disease Control and Prevention (CDC) is now recommending additional pertussis vaccination in adolescents and adults. A single dose of Tdap (tetanus and diphtheria toxoids and acellular pertussis) is recommended for adolescents 11 or 12 years of age, or in place of one Td (tetanus and diphtheria toxoids) booster in older adolescents and adults age 19 through 64. For adult contacts of infants and for health care workers, Tdap is recommended at an interval as short as 2 years since the previous administration of Td. For more information on pertussis vaccine recommendations please visit www.cdc.gov/mmwr/pdf/rr/rr5517.pdf.

Summary numbers for notifiable diseases in 2008 are presented in Table 1. A case report form is included at the end of this update. You can visit <http://www.cdphe.state.co.us/dc/Medlist.pdf> for a list of notifiable diseases in Colorado. Please note that upon receiving a report of any of these diseases, a public health department is likely to contact your patient to assess exposure and put appropriate control measures into place. If for some reason you would not like us to contact your patients, please let us know.

Also, please remember that all outbreaks from any cause are notifiable conditions and should be reported to the local or state health department within 24 hours of identification. The health department can facilitate testing for pathogens, and can provide guidance/assistance for outbreak investigation and infection control measures. Thank you!

If you have questions please contact your state or local health department:

Colorado Department of Public Health and Environment:
(303) 692-2700 / (303) 370-9395 (after hours)
Fax: (303) 782-0338

Tri-County Health Department:
(303) 220-9200 / (303) 461-2342 (after hours)
Fax: (303) 846-6295

Infectious disease control staff at Tri-County Health Department includes:

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Table 1. Reported Cases of

Notifiable Disease in Adams, Arapahoe and Douglas Counties, 2008.

Diagnosis	ADAMS	ARAPAHOE	DOUGLAS	Row Total
AIDS	32	43	4	79
Botulism, Infant	.	.	1	1
Campylobacter	52	67	23	142
Chlamydia *	1255	1635	218	3108
Cryptosporidiosis	1	6	5	12
Encephalitis Other	.	1	1	2
Giardiasis	35	78	41	154
Gonorrhea	247	540	49	836
Group A Strep Invasive	30	30	14	74
Group B Strep Invasive	35	39	6	80
Haemophilus influenzae	4	7	5	16
Hantavirus Pulmonary Syndrome	.	1	.	1
Hemolytic Uremic Syndrome	.	1	.	1
Hepatitis A	2	5	4	11
Hepatitis B, Acute	1	1	2	4
Hepatitis B, Chronic	54	109	22	185
Hepatitis B, Perinatal Infection	2	.	.	2
Hepatitis C, Acute	3	.	1	4
Hepatitis C, Chronic	231	270	67	568
HIV	47	46	3	96
Influenza-hospitalized	64	86	44	194
Kawasaki Syndrome	5	8	7	20
Legionellosis	3	4	.	7
Listeriosis	1	1	2	4
Malaria	.	4	.	4
Meningitis Aseptic/Viral	36	43	15	94
Meningococcal Disease	.	2	1	3
Mumps	1	.	.	1
Pertussis	7	22	9	38
Salmonellosis	47	63	30	140
Shigellosis	14	9	3	26
STEC (shiga toxin producing E.coli)	8	33	15	56
Strep Pneumo Invasive	54	62	25	141
Syphilis	28	30	11	69
Toxic Shock-Other	.	1	.	1
Tuberculosis	15	14	3	32
Varicella (Chicken Pox)	70	68	76	214
Vibriosis	.	2	.	2
West Nile Virus	7	1	.	8
Yersiniosis	.	1	1	2
Column Totals	2391	3333	708	6432

**TRI-COUNTY HEALTH DEPARTMENT
REPORTABLE DISEASE NOTIFICATION FORM
FOR PHYSICIANS AND OTHER HEALTH CARE PROVIDERS**

Case Information

Case's Name: _____ **Parent's Name:** _____

Age: _____ **Date of Birth:** _____ **Sex:** () Male () Female **Race:** _____

Home Phone(s): _____ **Work Phone(s):** _____

Address: _____ **City:** _____ **Zip:** _____

County of Residence: () Adams () Arapahoe () Douglas

If another county, please specify: _____ **School/Employer:** _____

Medical Information

Disease: _____ **Onset Date:** _____ **Specimen:** _____

Specimen Collect Date: _____ **Lab Tests Performed:** _____

Lab Confirmed: () Yes () No **Name of Lab Used:** _____

Other Relevant Medical/Rx/Immunization Info: _____

Doctor's Information

Doctor's Name: _____ **Doctor's Phone:** _____

Doctor's Address: _____ **City:** _____ **Zip:** _____

Report Submitted By: _____ **Phone:** _____

Organization: _____ **Date Reported:** _____

For your convenience, you may report diseases by phone Monday through Friday, 8:00 A.M. to 5:00 P.M. at (303) 220-9200 or you may complete this form and fax it 24 hours a day to (303) 220-9208.

For after hour and weekend emergencies:

Contact the Tri-County Health Department at (303) 461-2342

or the Colorado Department of Public Health and Environment at (303) 370-9395

For Internal Use:

Date Report Received: _____ **Received By** _____