

Public Health Brief

April 2010*

Notifiable Diseases 2009: A Year in Review

This Public Health Brief includes short descriptions of many of the disease outbreaks and large communicable disease control efforts investigated in 2009 by Tri-County Health Department (TCHD) in Adams, Arapahoe and Douglas Counties. In addition, summary numbers of notifiable diseases reported in 2009 in the Tri-County region are presented in a table. A case report form is included at the end of this update, along with the web address for a list of notifiable diseases in Colorado.

Summary of 2009 Cases and Outbreak Investigations

TCHD investigated 656 cases of notifiable diseases in 2009. These numbers do not include sexually-transmitted diseases, seasonal influenza or novel A (H1N1) influenza. Of the 656 case investigations, 211 were in **Adams County**, 290 were in **Arapahoe County** and 155 were in **Douglas County**. In 2009, TCHD also conducted a total of 53 outbreak investigations throughout our 3 counties. Of the 53 outbreaks, 13 were in **Adams County**, 29 in **Arapahoe County** and 11 in **Douglas County**. Furthermore, of the 53 outbreaks investigated in 2009, 32 were in long term care facilities, 11 were in child care centers, 7 were associated with restaurants and 3 was in the “other” category. Below are brief descriptions of some of the more notable outbreak and case investigations that TCHD conducted in 2009. As you may know, efforts related to novel influenza A (H1N1) consumed much of the year in 2009. However, TCHD was busy with other infectious disease responses as well. Therefore, we have included highlights from both our non-H1N1 and H1N1-related activities in the sections below.

Notable Non-H1N1 Investigations

Hepatitis A in a local grocery store produce handler.

On April 16, 2009, Tri-County Health Department was notified about a case of Hepatitis A in a produce worker at a local grocery store. While ill, the case handled many types of raw produce and also cut items, such as melons, which were packaged for sale in the store. As a result, Tri-County Health Department conducted a large post-exposure vaccination clinic for persons who may have consumed the produce handled by the case. Vaccination clinics were held at a local church on April 20, 2009 and April 21, 2009. Over 1200 vaccinations were given in an effort to prevent widespread hepatitis A infection.

This case highlights the importance of timely diagnosis and reporting of hepatitis A cases, as well as the need for food service workers to stay home from work when ill with diarrhea and/or vomiting. Fortunately, there were no known cases of hepatitis A associated with this produce handler.



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Hepatitis A is a virus that causes an illness that affects the liver. Symptoms begin 2-6 weeks (usually 28 days) after ingesting the hepatitis A virus and may include: Fever and feeling tired, poor appetite and nausea, sometimes vomiting, brownish or tea-colored urine, gray or light-colored feces (stools), diarrhea, jaundice (yellowing of the skin or the whites of the eyes), hepatitis A vaccine can provide protection against the illness. Depending on the age of the individual exposed, immune globulin or hepatitis A vaccine can be given within 14 days of ingesting the virus to help prevent symptoms or lessen the severity of illness.

E. Coli 0157:H7 Outbreak associated with the National Western Stock Show

In January 2009, Colorado hosted the National Western Stock Show (NWSS) at the National Western Complex in northern Denver. The show is held in January of each year and draws crowds from all over. In 2009, over 600,000 individuals and families attended the event. The show consists of several animal judging events, rodeos, exhibits/vendors, animal displays, children's area, and a petting zoo. Soon after the event, the Colorado Department of Public Health and Environment (CDPHE) discovered a sharp increase in *Escherichia coli* (*E. coli*) statewide and discovered through routine case investigation that these individuals reported attending the NWSS prior to illness. TCHD identified twelve *E. coli* 0157:H7 cases that had matching Pulse Field Gel Electrophoresis (PFGE) patterns to the NWSS outbreak. Eight attended the stock show and 4 were the result of secondary transmission. The median age of cases in the TCHD area was 2 years old (range: 1- 66 years) and the statewide median age was 5 years (range: 1-66 years). CDPHE conducted a case-control study to ascertain specific behaviors/exposures associated with illness and attending the NWSS. CDPHE found the likely cause of exposure was to animals located in the 3rd floor "Kids Zone" animal contact area.

Many schools and child care centers from around the state organized trips to the NWSS, so there was the potential for additional cases of illness in the community. TCHD identified an *E. coli* 0157:H7 case related to the NWSS that had attended childcare while ill. Additional cases of gastrointestinal illness were reported at that childcare facility. Further investigation by TCHD soon led to the discovery of an outbreak in that childcare center. All 17 students at the facility were tested for *E. coli*, regardless of symptoms. Of the 17, 4 were diagnosed with *E. coli* 0157:H7. One of these four students, diagnosed with hemolytic uremic syndrome (HUS), was hospitalized for several days, but eventually recovered. These four children with *E. coli* 0157:H7 had Pulse Field Gel Electrophoresis (PFGE) patterns that matched the NWSS outbreak. 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 diagnosed with *E. coli* 0157:H7 in order to return to the facility.

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.

Meningococcal Meningitis and Hookah Bar-Related Exposures

On March 30, 2009, Tri-County Health Department (TCHD) learned of a laboratory-confirmed case of meningococcal disease in a 16 year-old male residing in Douglas County. The reported case had been hospitalized for 3 days, and then sent home with intravenous antibiotics. TCHD immediately launched an investigation to identify close contacts of the case, in order to provide them with prophylaxis.

During the investigation, TCHD learned that one day prior to symptom onset, the case went to a hookah bar in Denver. While there, he shared a hookah pipe with 10 of his friends, ranging in age from 16 to 22 years. They were given separate mouth pieces for the pipe; however, because the mouth pieces were difficult to change out, they all shared the same mouth piece. As a result, all 10 friends received Rifampin prophylaxis within 48 hours of the case's diagnosis.

Education on disease prevention practices were provided to all close contacts and their families. In addition, Denver Public Health visited the hookah bar to provide education about sanitation and the possible dangers of sharing hookah pipe mouthpieces; they also addressed the issue of providing services to persons under the age of 18. Fortunately, there were no further cases of meningococcal disease associated with this particular case.

In 2009, there were a total of six meningococcal disease cases reported to TCHD, one of which resulted in death. Meningococcal meningitis is a severe and potentially life-threatening illness caused by *Neisseria meningitidis*. This bacteria can be spread through the exchange of respiratory and throat secretions (for example, through coughing or kissing). Some people carry the meningococcal bacteria in their nose or throat without becoming ill. Meningitis is characterized by a sudden onset of fever, headache, and stiff neck approximately 1-10 days after exposure. It is often accompanied by other symptoms such as nausea, photophobia, vomiting and an altered mental status. Approximately 10-14% of people with meningococcal disease die from their infection.

Meningococcal conjugate vaccine is routinely recommended for all 11 through 18 year olds, as well as for people with certain immune deficiencies and individuals living in close quarters or dormitories, such as college freshmen and military recruits. The conjugate vaccine covers meningococcal serogroups A, C, Y and W-135. In this instance, the case developed illness despite being vaccinated in 2007. This may be a result of an insufficient vaccine response in this individual. For more information on meningococcal vaccine, visit www.cdc.gov/vaccines/vpd-vac/mening/vac-mening-fs.htm.

The Emergence of H1N1 and Associated TCHD Efforts

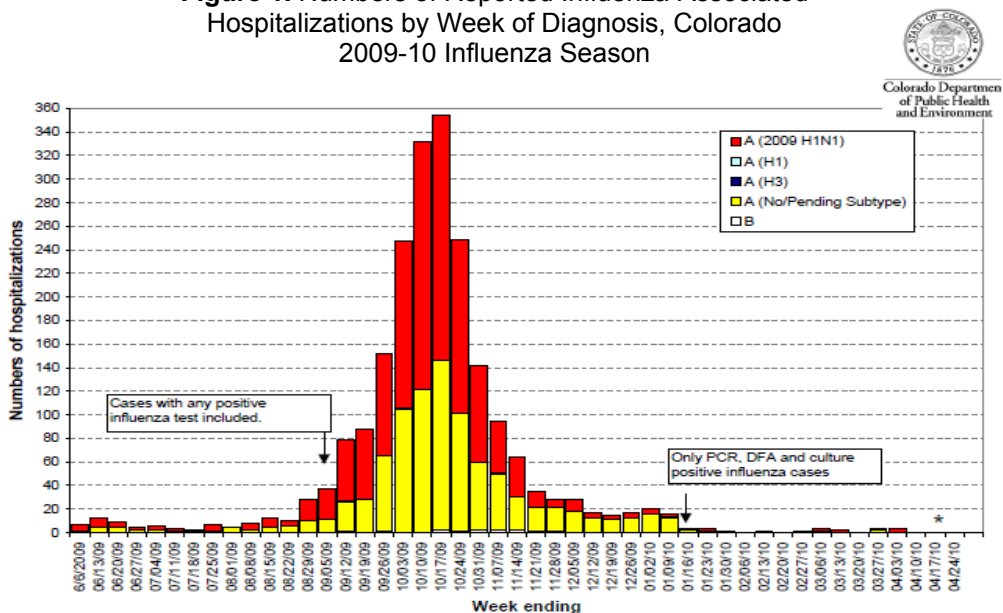
Overview of the Emergence of Novel Influenza A (H1N1)

In April 2009 the Centers for Disease Control (CDC) isolated a novel influenza A virus from two children residing in southern California. Further analysis showed that this virus differed substantially from other known human influenza A subtypes, but was very similar to a strain circulating in Mexico in March and early April 2009. This virus was originally referred to as “swine flu” because of genetic similarities to influenza viruses that normally occur in pigs (swine) in North America. However, further study indicated that this new virus contained a mixture of genes from influenza viruses that circulate in pigs, birds, and humans. The virus was then dubbed the novel influenza A (H1N1) virus. By May 2009 every region of the United States was affected by the novel influenza A (H1N1) virus and preparations began for development of a vaccine. The World Health Organization (WHO) declared the first influenza pandemic of the 21st century on June 11, 2009, only two months after the first human infections with novel influenza A (H1N1) virus were reported from Mexico and the United States.

Epidemiology of H1N1 in Adams, Arapahoe and Douglas Counties and Colorado

On April 30, 2009 the Colorado Department of Public Health and Environment (CDPHE) reported the first two confirmed cases of novel influenza A (H1N1) in Colorado. Both cases were within Tri-county Health Department’s (TCHD) jurisdiction, residing in Arapahoe and Douglas counties, respectively. Cases of influenza A were detected in Colorado throughout the summer of 2009, with a sharp increase in clinic visits for influenza-like illness (ILI) and influenza-associated hospitalizations (Figure 1) starting in late August 2009. This coincided with the start of the 2009-2010 school year and launched the 2009-2010 influenza season in Colorado. For the 2009-2010 influenza season, both ILI clinic visits and influenza-associated hospitalizations (Figure 1) in Colorado peaked in mid-October.

Figure 1. Numbers of Reported Influenza-Associated Hospitalizations by Week of Diagnosis, Colorado 2009-10 Influenza Season



The number of influenza-associated hospitalizations diagnosed between August 30, 2009 and March 27, 2010 by viral subtype for Adams, Arapahoe and Douglas counties and Colorado is shown in Table 1. Adams, Arapahoe and Douglas counties had a total of 697 influenza-associated hospitalizations with 65% attributed to novel H1N1 influenza A and 34% attributed to influenza A with unknown subtype. Based on CDC’s estimate that ~99% of circulating influenza virus during this time period was novel influenza A (H1N1), it is likely that the majority of the 34% with unknown influenza A subtype were infected with novel influenza A (H1N1). A total of 69 influenza-associated deaths (12 pediatric and 57 adult) occurred in Colorado during August 30, 2009 to April 10, 2010. Of the 69, 84% had an underlying condition and the majority (61%) of influenza-related deaths occurred in adults 25 to 64 years of age. Three of the pediatric deaths were residents of Arapahoe County.

Table 1. Number of influenza-associated hospitalizations during the 2009-2010 influenza surveillance season by county and viral subtype—Colorado, 2009-2010. *Source: Colorado Department of Public Health and Environment (CDPHE).*

County	Cumulative No. of Influenza-Associated Hospitalizations 08/30/2009—03/27/2010					Total
	A				B	
	H1N1	H3	H1	Unk		
Adams	198	0	0	86	1	285
Arapahoe	207	0	0	112	1	320
Douglas	51	0	0	41	0	92
Colorado	1152	2	0	862	13	2029

H1N1 Public Information and School Surveillance

TCHD used a multifaceted approach to respond to the emergence of novel influenza A (H1N1) and communicate with the public, healthcare providers, schools and its stakeholders. Approaches to management of public information and communication included continued utilization of the Health Alert Network (HAN), launching an influenza-specific webpage (www.tchd.org/flu/htm) containing the most up-to-date influenza prevention and vaccine information, initiating an H1N1 phone tree and call center dedicated to influenza-related calls, and active surveillance of ILI-related illness in Adams, Arapahoe and Douglas county schools.

The phone tree enabled TCHD staff to focus on the most pressing issues of the H1N1 response by diverting H1N1 calls to a call center where common questions could be answered. In all, the TCHD phone tree managed 6341 calls between September 14, 2009 and January 12, 2010; 94% of the calls were handled by the call center. Of the 6,341 calls the vast majority (93%) were from the public, with physicians being the second-most frequent callers (4%).

Active school surveillance of absenteeism identified 335 schools with ILI-associated outbreaks between August 31, 2010 and March 27, 2010. TCHD Disease Intervention staff worked with Adams, Arapahoe and Douglas county school nurses and superintendents throughout the 2009-2010 influenza season to help prevent and control ILI-associated outbreaks. Prevention and control measures discussed with schools included exclusion of ill students and staff, promotion of increased hand washing and cleaning, social distancing and cancellation of larger events during an outbreak.

H1N1 Vaccine Distribution by TCHD

TCHD began its jurisdiction-wide H1N1 vaccination campaign in October of 2009. The campaign involved thousands of constituents, hundreds of health care providers and dozens of community vaccination clinics. The primary elements of TCHD's vaccination campaign included vaccine distribution, mass vaccination and public information.

Over 341,000 doses of H1N1 vaccine were allocated within the TCHD jurisdiction during the 2009-2010 influenza season. The majority of vaccine (67%) was shipped directly to health care providers, followed by 19% used for TCHD's mass vaccination community clinics. The remaining vaccine was used in WIC clinics or distributed to other TCHD partners. TCHD held 62 mass vaccination community clinics from November 5 to December 19, 2009. These clinics were held at thirty-eight different locations throughout Adams, Arapahoe and Douglas counties and provided free H1N1 vaccine to 63,137 persons. Most weeks, vaccination clinics were held 6 days per week with TCHD operating two to three clinics per day. The majority of H1N1 vaccine distributed at the community clinics was given to those at highest risk of complications from H1N1 infection. Sixty-six percent of H1N1 vaccine was administered to persons under the age of 25 and 31% given to persons aged 25 to 64 years of age who had certain underlying health conditions, were a health care provider, pregnant or cared for a child less than 6 months of age.

Given the complexity of this endeavor, significant TCHD staff support was needed and received. Almost all TCHD employees served in some capacity in response to the novel influenza A (H1N1) pandemic, either planning the H1N1 public information and vaccination efforts, providing influenza information, working in the field at community vaccination clinics, managing the Department of Operations Center (DOC), staffing the H1N1 call center or responding to ILI-associated outbreaks. Additionally, TCHD received significant support from hundreds of volunteers with almost 150 volunteers working at least one community clinic.

As of April 17, 2010 sporadic influenza activity continues throughout the majority of the United States with almost 100% of influenza strains being identified as novel influenza A (H1N1). The FDA's Vaccines and Related Biological Products Advisory Committee and the World Health Organization have recommended that the 2009 H1N1 strain of influenza A virus be included in the 2010-2011 seasonal vaccine. The H1N1 vaccine is still available and getting immunized now can protect you against H1N1 while it continues to circulate in the United States as well as worldwide.

2009 Notifiable Disease Summary

Summary numbers for notifiable diseases in 2009 are presented in the table on the following page. A case report form is included at the end of this update. You can visit 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 outbreaks due to 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

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Reported Cases of Notifiable Disease in Adams, Arapahoe and Douglas Counties, 2009.*

Diagnosis	ADAMS	ARAPAHOE	DOUGLAS	Row Total
ANIMAL BITES	14	9	3	26
AIDS	37	36	.	73
CAMPYLOBACTER	55	69	45	169
CHLAMYDIA	1744	2723	372	4839
CRYPTOSPORIDIOSIS	7	6	9	22
ENCEPHALITIS OTHER	2	.	.	2
GIARDIASIS	33	56	31	120
GONORRHEA	151	416	26	593
GROUP A STREP INVASIVE	26	24	17	67
GROUP B STREP INVASIVE	48	50	12	110
HAEMOPHILUS INFLUENZAE	4	10	4	18
HEMOLYTIC UREMIC SYNDRM	2	.	3	5
HEPATITIS A	2	5	.	7
HEPATITIS B, ACUTE	7	2	.	9
HEPATITIS B, CHRONIC	71	107	23	201
HEPATITIS C, ACUTE	4	4	1	9
HEPATITIS C, CHRONIC	205	247	60	512
HIV	39	25	5	69
INFLUENZA-hospitalized	343	398	109	850
INFLUENZA-pediatric death	1	1	1	3
KAWASAKI SYNDROME	5	7	5	17
LEAD, ELEVATED BLOOD	.	.	1	1
LEGIONELLOSIS	5	6	1	12
LISTERIOSIS	1	1	1	3
MALARIA	1	8	2	11
MENINGITIS ASEPTIC/VIRAL	15	43	9	67
MENINGOCOCCAL DISEASE	2	3	1	6
MUMPS	.	1	.	1
PERTUSSIS	13	26	4	43
Q FEVER ACUTE	1	.	.	1
SALMONELLOSIS	58	65	36	159
SHIGELLOSIS	10	11	2	23
STEC (shiga toxin producing E.coli)	9	17	17	43
STREP PNEUMO INVASIVE	81	64	18	163
SWINE FLU*	36	48	21	105
SYPHILIS	8	10	3	21
TOXIC SHOCK-OTHER	1	.	.	1
TUBERCULOSIS	4	11	4	19
TULAREMIA	.	1	.	1
TYPHOID FEVER	.	1	1	2
VARICELLA(CHICKEN POX)	51	32	21	104
VIBRIOSIS	1	1	.	2
WEST NILE VIRUS	6	10	.	16
YERSINIOSIS	2	1	.	3
Column Totals	3105	4555	868	8528

*Please note: TCHD investigated cases of "swine influenza" through the spring and summer 2009. As of August 30, 2009, when the 2009-2010 influenza season officially began, that diagnosis was no longer used and cases were tracked through hospitalized influenza cases.



**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 _____

Information on an upcoming event in the area:

New Body Worlds Exhibition Comes to Denver

Tri-County Health Department joins the Denver Museum of Nature & Science in promoting Gunther von Hagens' *BODY WORLDS* & The Story of the Heart.

This all-new *BODY WORLDS* exhibition has a special emphasis on the heart, and reveals—through the lenses of anatomy, cardiology, psychology and culture—how the heart muscle nourishes, regulates and sustains life.

Specimens on display are completely different from previous presentations of *BODY WORLDS* and include whole-body plastinates, organs and translucent body slices. All anatomical items on display are authentic, and the individuals donated their bodies specifically for display. In essence, the bodies are frozen in time between death and decay.

This exhibition also illustrates numerous public health concerns in vivid detail, including the results of healthy habits such as good nutrition and exercise, along with health threats such as smoking and obesity.

Tri-County receives no compensation for promoting the exhibit or for ticket sales, but we strongly believe that when people understand more about how the body works, they become more involved in taking better care of themselves to sustain good health.

For more information visit www.tchd.org/bodyworlds.htm