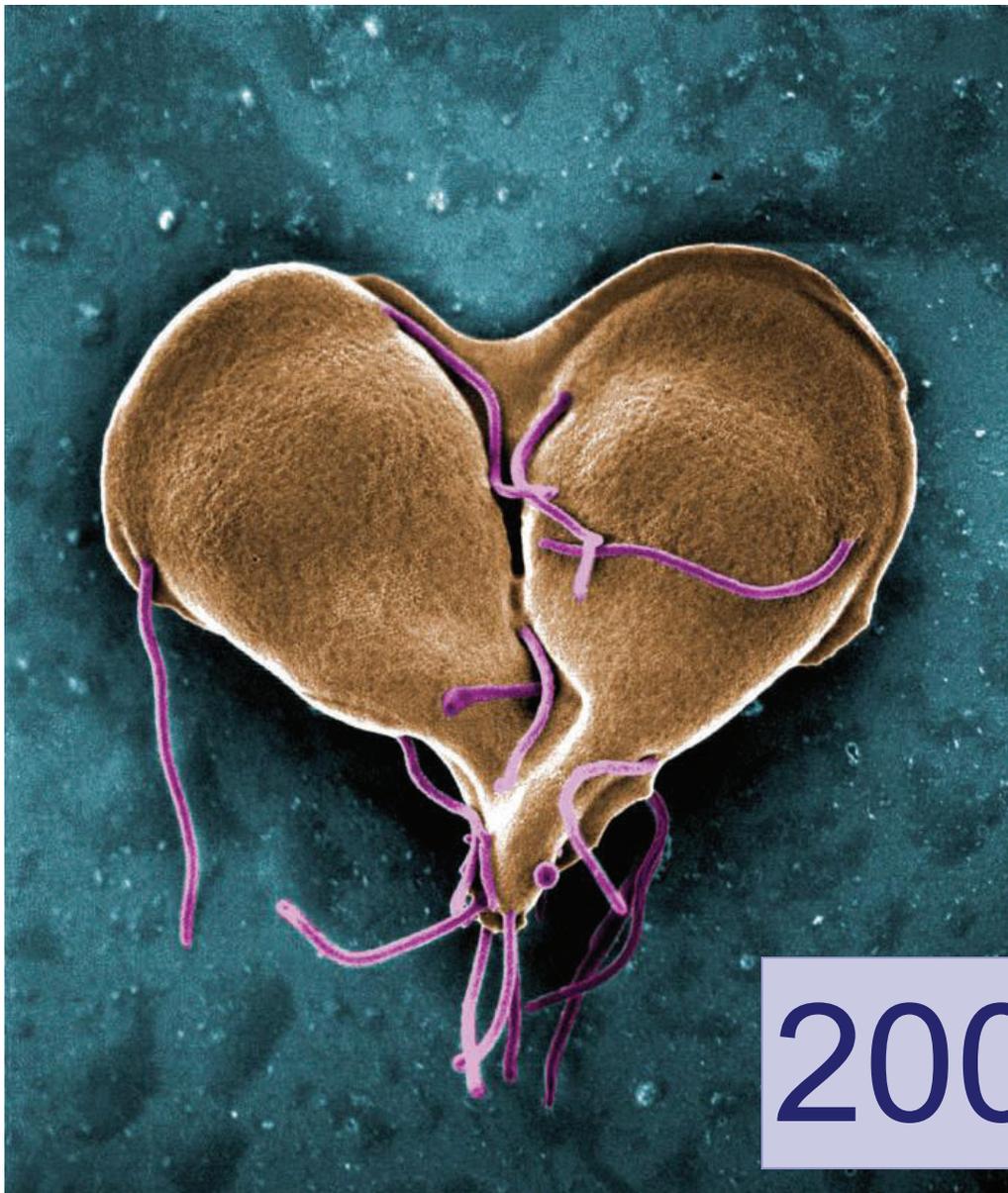


**Notifiable
Disease Report**



2009



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Notifiable Disease Report—2009

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Introduction

This report is intended to provide an overview of the reported diseases and conditions in Davidson County in 2009. It is a collaborative report of several divisions within Metro Public Health Department (MPHD). Presented in this report are data reported to MPHD by local health providers, laboratories, and others with knowledge of suspected or diagnosed reportable diseases or conditions among residents of Davidson County. A table of all reported notifiable diseases over the past 10 years (2000 to 2009) is presented on pages 6-7. Select diseases are presented in detail in subsequent sections. The last section details outbreaks investigated in 2009. As with all data on infectious diseases, what is reported to the local health department is assumed to represent only a fraction of the overall incidence of disease in the community due to multiple reasons, such as asymptomatic infections or seeking clinical diagnosis. As such, data in this report should be viewed as only a narrow snapshot of true disease burden in Davidson County.

What this Report Contains

Included in the report are descriptive summaries of 9 routinely reported diseases among residents of Davidson County. These diseases were selected because they were determined to be of general interest to a wide audience and were annually reported in sufficient numbers to allow further descriptive analysis. Data from each of these diseases is presented in various formats including tables, graphs, and narrative description. Rates of disease incidence in Davidson County are presented alongside those for the state of Tennessee and the United States when available. However, not all diseases reportable in Tennessee are reportable nationally. Also included is basic etiologic information on each disease including causative agent, general symptoms, incubation period, and common transmission modes. Lastly, where applicable, information is presented for those diseases and conditions for which there are Healthy People 2010 Goals for the general population.

What is Not Included in this Report

It is important to note that specific descriptive data concerning sexually-transmitted diseases, HIV/AIDS, and tuberculosis are not included in this report, but information concerning these diseases and conditions can be found by accessing specific program information at www.health.nashville.gov.

On Notifiable Diseases

The reporting of select diseases and conditions to the local health department allows for subsequent investigation of case trends for outbreak detection and increased disease prevention and is a part of a mainly passive surveillance system to monitor and protect the public health in communities throughout the nation. In Davidson County, notifiable disease reports are investigated at the local level by MPHD and results are disseminated to Tennessee Department of Health's (TDH) Communicable and Environmental Disease Services (CEDS) where further analysis for statewide trends may take place. In turn, data on case counts are reported to Centers for Disease Control and Prevention (CDC), where national trends are assessed. In Tennessee, TDH is given responsibility for the formulation of regulations for the control of communicable diseases under provisions of the Tennessee Codes Annotated. Periodically, changes are made to the list of conditions requiring healthcare provider and laboratory reporting based upon the assessment of public health surveillance and response needs. The most recent list of reportable diseases and conditions and reporting requirements can be found at the end of this report (see Appendix I). Case definitions for diseases and conditions are determined at the national level by the Council of State and Territorial Epidemiologists (CSTE) in collaboration with CDC. Revisions are made during the annual meeting of CSTE and reflect changing understanding in both clinical aspects and laboratory tests and standards for nationally notifiable diseases. However, each state is the governing authority as to which diseases and events are reportable within its jurisdiction.

Introduction

Methods and Data Sources

Data for Davidson County cases were obtained by querying the National Electronic Disease Surveillance System (NEDSS) database for all reported incidents among county residents from 2000 to 2009. A data file was extracted from the query and analyzed using MS Excel 2003 and SAS v. 9.2. All reported diseases determined to be either confirmed or probable upon initial investigation were counted as cases and included in this report. Data was cleaned for duplicate entries which were removed from further analysis.

Data for statewide reported diseases and events were obtained via the TDH interactive web portal at <http://health.state.tn.us/ceds/reports.htm> on April 19, 2010. Additionally, nationwide case counts for select diseases were obtained from individual annual reports from CDC's Morbidity and Mortality Weekly Report: Summary of Notifiable Diseases publications available by year of report online at www.cdc.gov/mmwr/mmwr_nd/index.html.

Demographic information on population for Davidson County and the state of Tennessee were obtained from TDH, Office of Policy, Planning and Assessment, Division of Health Statistics, 2008 Revision (2/08).

Information on disease etiology and clinical symptoms was obtained from several reference materials used routinely by members of MPHD staff in notifiable disease investigations, namely, the *Control of Communicable Diseases Manual* (19th edition; David L. Heymann, MD, editor) and the *Red Book: 2009 Report of the Committee on Infectious Diseases* (28th edition; American Academy of Pediatrics). Also consulted for this report were CDC's Diseases & Conditions web pages available online at <http://cdc.gov/DiseasesConditions>.

Healthy People 2010 goals were obtained from a previously published MPHD report entitled *The Healthy People 2010 Report* (The Division of Epidemiology, September 2009) which is available online at <http://health.nashville.gov/HealthData/RecentPublications.htm>. Healthy People 2010 is a national initiative which provided a set of objectives that the public health system (local, state, and federal) attempted to achieve in the first decade of the 21st century. The objectives were designed to identify the most significant preventable threats to health and to establish national goals for the significant reduction of those threats. Currently, CDC is working with state and local collaborators toward a new set of goals and objectives for Healthy People 2020 looking ahead to the next 10 years in improving the Nation's health.

Note on rates

In this report, disease incidence is reported as number of cases per 100,000 people. When reporting stratified data such as disease incidence among age groups, the incidence rate is the number of cases per 100,000 people within that age group, e.g. there were 44,695 children under 5 years of age in 2009 in Davidson County, so if 10 cases of a disease were reported among those under 5 years of age that year, that would translate into a rate of 22.4 cases per 100,000 children under 5 years of age in Davidson County in 2009.

Caution should be used when comparing incidence rates between different populations such as those regarding residents of Davidson County to those in the entire state of Tennessee or the United States. Differences in two populations (such as age distribution, overall health, smoking prevalence, activity levels, to name a few) make comparing different populations problematic.

Lastly, when dealing with small numbers of cases, as is the case with many infectious diseases, incidence expressed in rates of disease may be unstable and should be interpreted with caution. In this report, an effort is made to indicate where rates may be particularly unstable, such as when the number of cases used to calculate the numerator of the incidence rate are fewer than 5.

Select Reportable Diseases and Conditions, 2000-2009

Davidson County

Disease/Condition	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Botulism (Infant)	0	1	1	0	0	0	0	0	0	0
Brucellosis	0	0	0	0	1	0	0	0	0	0
Campylobacteriosis	41	43	36	21	32	38	43	28	26	26
Chlamydia (<i>Chlamydia trachomatis</i>)	2403	2086	2157	2653	2664	2819	2978	3038	3439	3628
Cryptosporidiosis	1	7	0	8	5	3	7	9	0	0
Cyclosporiasis	0	0	0	0	0	0	0	0	1	0
Ehrlichiosis-HGE (<i>Anaplasma phagocytophilum</i>)	0	0	0	0	1	1	0	0	0	0
Ehrlichiosis-HME (<i>Ehrlichia chaffeensis</i>)	4	5	3	5	1	0	4	1	19	2
Ehrlichiosis/Anaplasmosis-Other	0	0	0	0	0	2	1	2	3	0
Giardiasis	26	25	36	36	53	41	55	53	32	54
Gonorrhea (<i>Neisseria gonorrhoeae</i>)	2404	1625	1409	1492	1221	1116	1312	1290	1090	875
Group A Streptococcal Invasive Disease (<i>S. pyogenes</i>)	16	20	4	19	15	26	33	15	29	17
Group B Streptococcal Invasive Disease (<i>S. agalactiae</i>)	2	27	28	41	19	61	49	41	43	31
Guillain-Barré syndrome	0	0	0	0	0	2	0	0	0	5*
<i>Haemophilus influenzae</i> Invasive Disease	6	3	5	11	3	10	8	13	11	15
Hemolytic Uremic Syndrome (HUS)	3	1	0	1	1	2	3	1	3	1
Hepatitis, Viral-Type A acute	44	46	18	12	22	24	12	18	4	1
Hepatitis, Viral-Type B perinatal	0	0	0	0	0	0	0	2	0	0
Hepatitis, Viral-Type B acute	39	30	21	23	16	15	26	9	9	3
Hepatitis, Viral-Type C acute	17	10	2	2	0	0	0	0	0	0
HIV Infections, new diagnosis	268	192	391	211	210	197	209	226	213	255
HIV/AIDS, cumulative cases	2642	2735	2859	2982	3084	3199	3346	3517	3695	3925
Legionellosis	0	0	2	2	0	3	2	4	5	6
Leprosy [Hansen Disease]	0	1	0	0	0	0	0	0	0	0
Listeriosis	2	0	0	2	1	1	0	2	3	0
Lyme Disease	3	3	3	2	1	2	1	8	3	0
Malaria	5	9	1	1	1	3	5	5	6	1
Measles	0	0	0	0	0	1	0	0	0	0
Mumps	0	0	1	1	0	1	2	0	0	0
Meningitis-Other Bacterial	7	8	3	4	0	0	1	2	0	0
Meningococcal Disease (<i>Neisseria meningitidis</i>)	7	6	7	1	1	3	4	4	2	4
Pertussis	8	3	14	13	21	19	18	8	20	19
Prion disease – Creutzfeldt Jakob Disease	0	0	0	0	0	0	1	0	0	0

Select Reportable Diseases and Conditions, 2000-2009

Davidson County

Disease/Condition	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Q Fever	0	0	0	0	0	0	1	1	0	0
Rocky Mountain Spotted Fever (<i>Rickettsia rickettsii</i>)	2	10	11	8	2	3	16	10	22	3
Salmonellosis	74	72	70	56	64	74	69	60	71	66
Salmonellosis: Typhoid Fever (<i>S. Typhi</i>)	0	0	0	1	1	0	0	1	0	0
Shiga toxin-producing <i>Escherichia coli</i> (including <i>E. coli</i> O157:H7)	9	6	5	2	6	5	5	7	6	3
Shigellosis	18	8	11	13	55	257	13	14	38	123
<i>Staphylococcus aureus</i> : Methicillin-resistant Invasive Disease (MRSA)	0	0	0	0	12	208	239	203	227	156
<i>Streptococcus pneumoniae</i> Invasive Disease	74	81	83	70	55	91	97	91	104	106
Syphilis (<i>Treponema pallidum</i>), all stages	522	380	294	195	164	144	166	206	234	243
Early (Primary, Secondary, Early Latent)	373	213	135	46	37	45	70	111	121	126
Late and Late Latent	145	162	154	149	124	99	96	76	113	121
Congenital	4	5	5	0	3	0	0	0	0	1
Toxic Shock Syndrome: Staphylococcal	2	0	0	0	1	0	1	0	1	0
Toxic Shock Syndrome: Streptococcal	1	0	0	0	0	0	0	0	0	0
Tetanus	0	1	0	0	0	0	0	0	0	0
Tuberculosis (<i>Mycobacterium tuberculosis</i> complex)	-	-	-	62	55	66	60	61	77	62
Tularemia	0	1	0	0	0	1	0	0	0	0
Vancomycin-resistant Enterococci (VRE) Invasive Disease	60	61	56	56	43	25	35	30	42	48
Vibriosis (<i>Vibrio</i> species)	0	0	0	0	2	2	2	0	0	0
West Nile virus Infections-Encephalitis	0	0	1	1	0	0	0	0	0	0
West Nile virus Infections-Fever	0	0	0	0	0	0	1	0	0	0
Yersiniosis	1	2	1	1	6	2	3	2	3	4

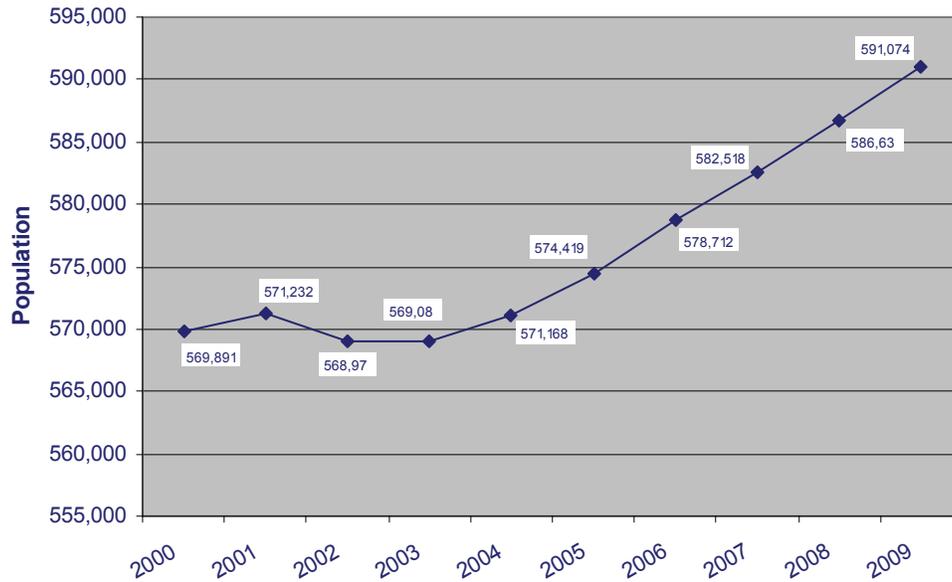
Technical Notes:

- HIV new diagnosis--HIV data includes persons with a diagnosis of HIV infection by year of diagnosis, regardless of disease progression.
- Sexually transmitted diseases (chlamydia, gonorrhea, and syphilis) are presented by date of report.
- All others include cases determined to either be confirmed or probable upon investigation and are reported by date of onset when available. If date of onset is unavailable, the following dates were used as surrogates for onset, respectively: date of diagnosis, date of specimen collection, and date of report receipt by MPH.D.
- As of 4/14/2010, giardiasis is no longer a reportable disease in the state of Tennessee

* In 2009, due to concerns of Guillain-Barré Syndrome (GBS) after vaccination for pandemic influenza A (H1N1), TDH cooperated with other states in the Emerging Infections Program (EIP) to conduct an active surveillance system for GBS. The number of cases found in Davidson County and the state of Tennessee during active surveillance did not exceed the number of cases expected during the time period of the study.

Nashville and Davidson County Population, 2000-2009

Nashville and Davidson County Population, 2000-2009



Demographic Distribution of Davidson County Population, 2009

Age (in yrs)	Population	%
Under 5	44,695	7.6
5 – 14	75,236	12.7
15 – 24	70,454	11.9
25 – 34	96,397	16.3
35 – 44	84,116	14.2
45 – 54	88,408	15.0
55 – 64	65,177	11.0
65+	66,591	11.3
Total	591,074	100.0

Sex	Population	%
Male	289,835	49.0
Female	301,239	51.0
Total	591,074	100.0

Ethnicity	Population	%
Hispanic	45,671	7.7
non-Hispanic	545,403	92.3
Total	591,074	100.0

Race	Population	%
Black	164,966	27.9
White	398,234	67.4
Other	27,874	4.7
Total	591,074	100.0



Wild iris. US Fish and Wildlife Service.

Campylobacteriosis

Campylobacteriosis in Davidson County

- In 2009, campylobacteriosis incidence was similar across all age groups in Davidson County which differs from what has been seen locally in the 3 years prior (2006-2008) when those under 5 years of age made up the largest proportion of cases (30%).
- Males comprised 69% of all reported cases in 2009 (18 of 26).
- A majority of cases (14 of 26, or 54%) were reported in the summer months in 2009 which is similar to what was seen in years past. One explanation for this may be greater consumption of undercooked poultry due to improper temperature monitoring while grilling.
- From 2000 to 2009, both Davidson County and Tennessee met the goal set out by Healthy People 2010 of fewer than 12.3 cases per 100,000.

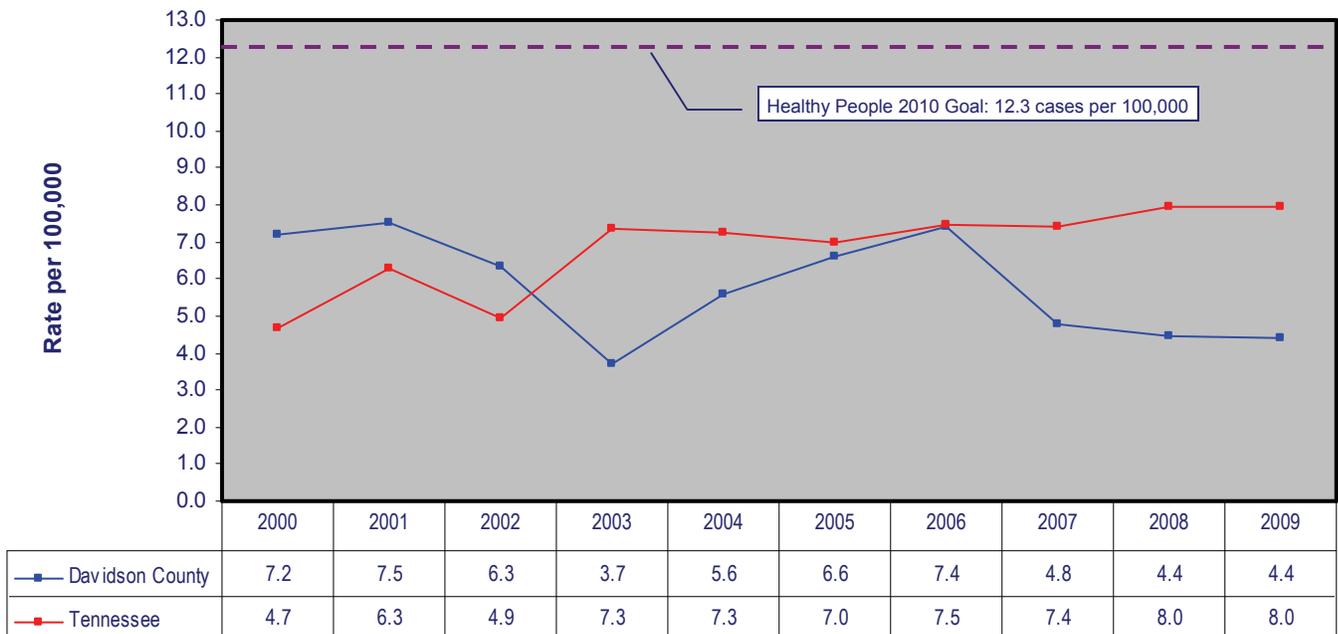
Infectious agents: species of the bacterial genus *Campylobacter* (e.g. *C. jejuni* and *C. coli*)

Transmission: foodborne (particularly under-cooked poultry and raw milk), waterborne, contact with infected pets (particularly puppies and kittens)

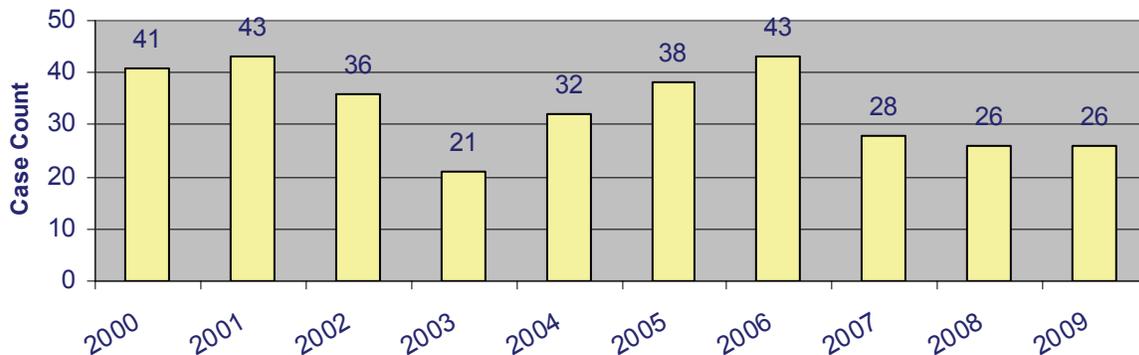
Incubation Period: usually 2-5 days

Symptoms: diarrhea (may be bloody), abdominal pain, malaise, nausea, vomiting, fever

Campylobacteriosis Incidence, Davidson County and Tennessee, 2000-2009



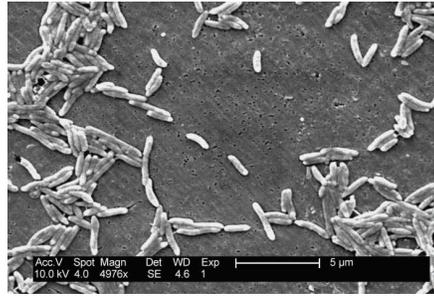
Reported Campylobacteriosis Cases by Year, Davidson County, 2000-2009



Campylobacteriosis

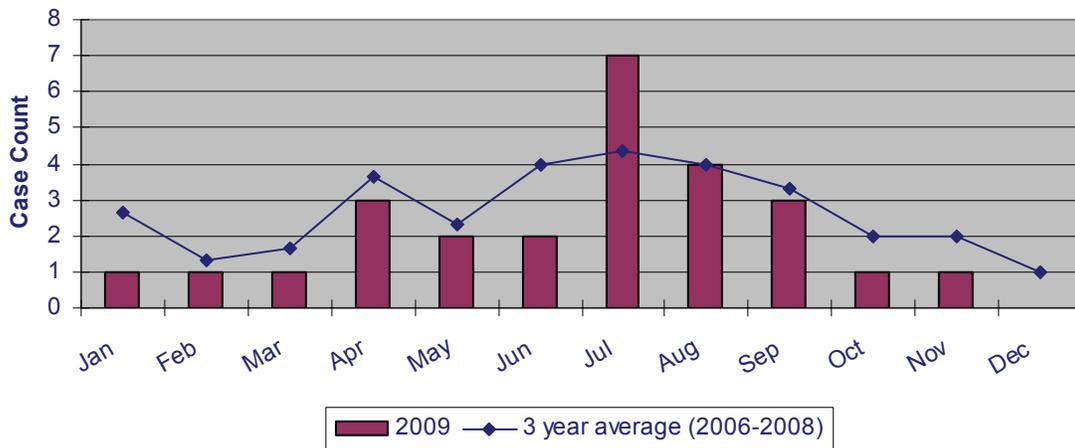
Reported Cases of Campylobacteriosis in Davidson County and County Demographics, 2009

Variable	Campylobacteriosis Cases		County Population
	N	%	%
Gender			
Male	18	69.2	49.0
Female	8	30.8	51.0
Age Group (yrs)			
Under 5	2	7.7	7.6
5 – 14	3	11.5	12.7
15 – 24	5	19.2	11.9
25 – 34	2	7.7	16.3
35 – 44	2	7.7	14.2
45 – 54	5	19.2	15.0
55 – 64	4	15.4	11.0
65+	3	11.5	11.3



Campylobacter fetus. Public Image Library, CDC / Drs. Patricia Fields, Collette Fitzgerald.

Reported Campylobacteriosis Cases by Month of Onset[§], Davidson County, 2009



[§]If date of onset was unavailable, the following dates were used as surrogates for onset: date of diagnosis, date of specimen collection, and date of report receipt by MPHDP.

Giardiasis

Giardiasis in Davidson County

- In 2009, over 51% of Davidson County giardiasis cases (28 of 54) were reported during the late spring and summer months from May to August, following a similar seasonal pattern seen locally over the previous 3 years (2006-2008).
- Increased rates of illness in the warmer months may be due to increased outdoor recreational exposure to unfiltered water.
- Males comprised 61% of all reported cases in 2009 (33 of 54).
- Those under 15 years of age accounted for 61% of all cases reported (33 of 54), although those in this age group comprise only 20% of the county population.
- Younger children (those under 5 years of age accounted for 20% of cases) in child-care settings may be exposed and expose others due to unsupervised personal hygiene practices.

Infectious agents: protozoan species

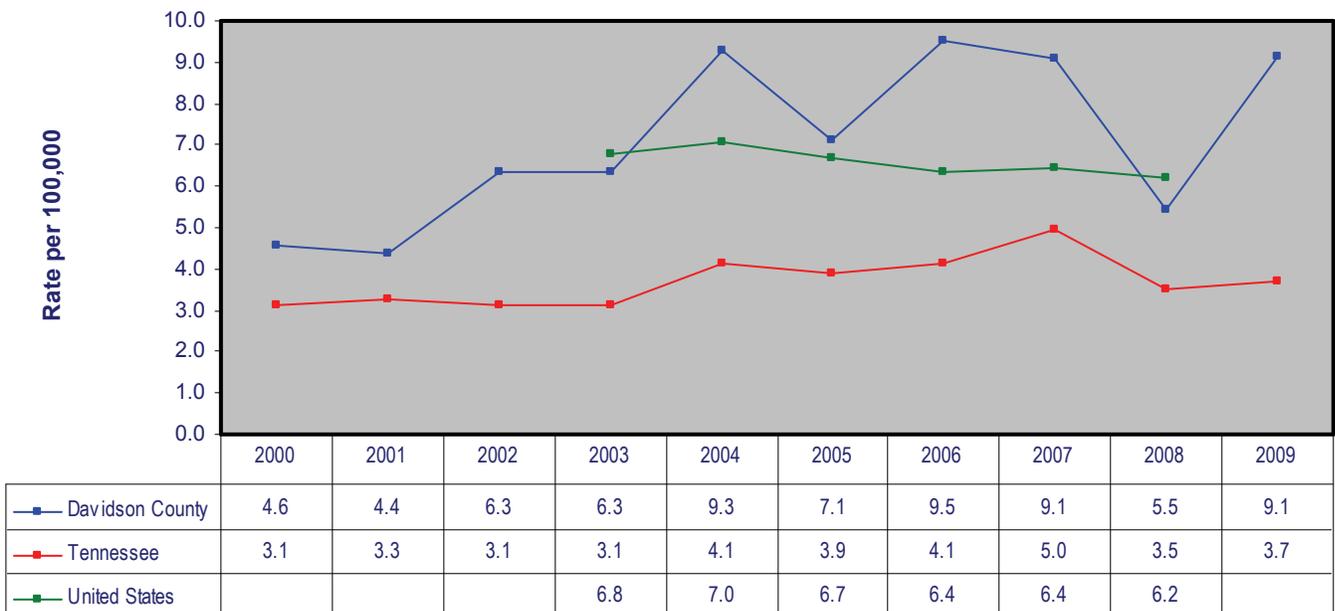
Giardia lamblia

Transmission: person-to-person via fecal-oral route, waterborne (especially through unfiltered stream or lake water), foodborne sexual contact

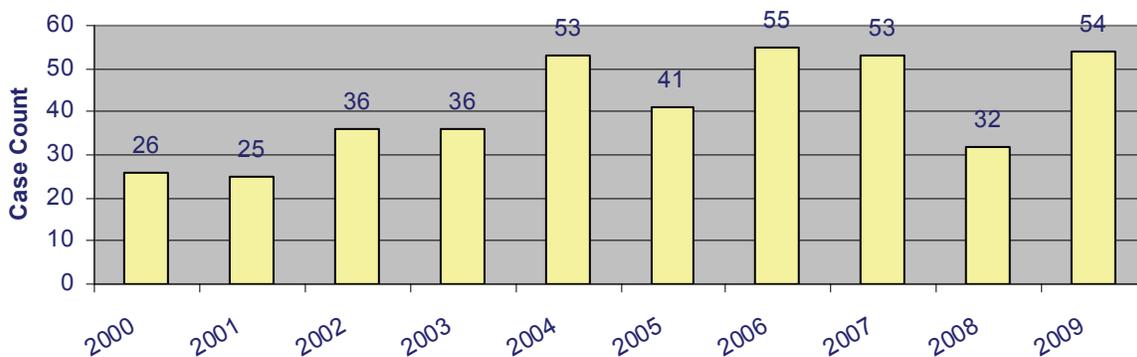
Incubation period: usually 7-10 days.

Symptoms: diarrhea, loose greasy stools, abdominal cramps, fatigue; can also be asymptomatic.

Giardiasis Incidence, Davidson County, Tennessee, and United States, 2000-2009



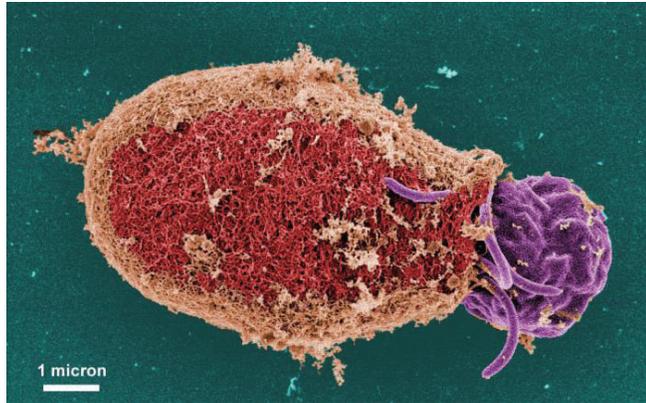
Reported Giardiasis Cases by Year, Davidson County, 2000-2009



Giardiasis

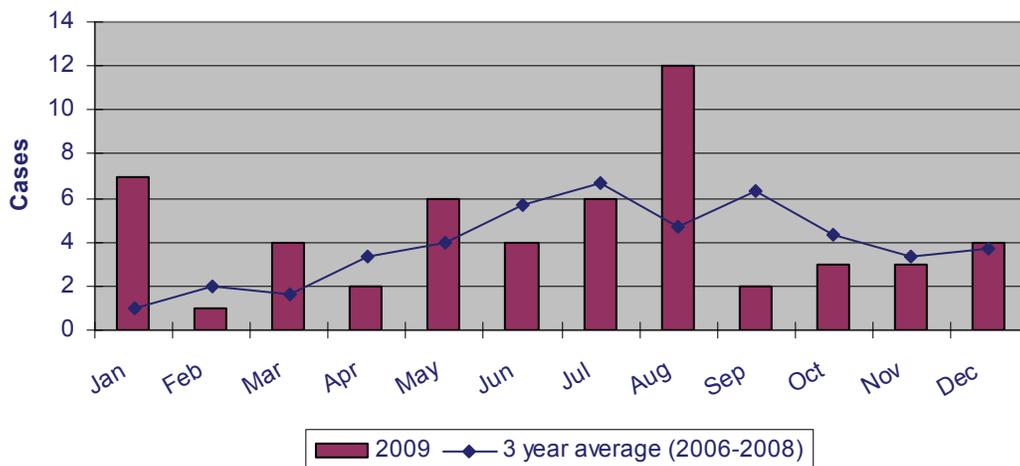
Reported Cases of Giardiasis in Davidson County and County Demographics, 2009

Variable	Giardiasis Cases		County Population
	N	%	%
Gender			
Male	33	61.1	49.0
Female	21	38.9	51.0
Age Group (yrs)			
Under 5	11	20.4	7.6
5 – 14	22	40.7	12.7
15 – 24	5	9.3	11.9
25 – 34	10	18.5	16.3
35 – 44	5	9.3	14.2
45 – 54	0	0.0	15.0
55 – 64	0	0.0	11.0
65+	1	1.9	11.3



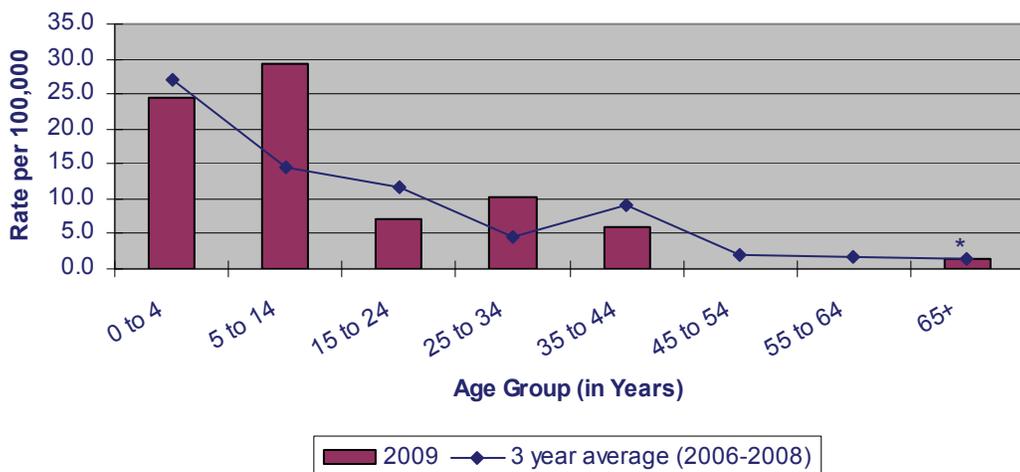
Giardia protozoan cyst. Public Image Library, CDC / Dr. Stan Erlandsen.

Reported Giardiasis Cases by Month of Onset[§], Davidson County, 2009



[§]If date of onset was unavailable, the following dates were used as surrogates for onset: date of diagnosis, date of specimen collection, and date of report receipt by MPH. D.

Giardiasis Incidence by Age Group, Davidson County, 2009



*Rate may be unstable

Hepatitis

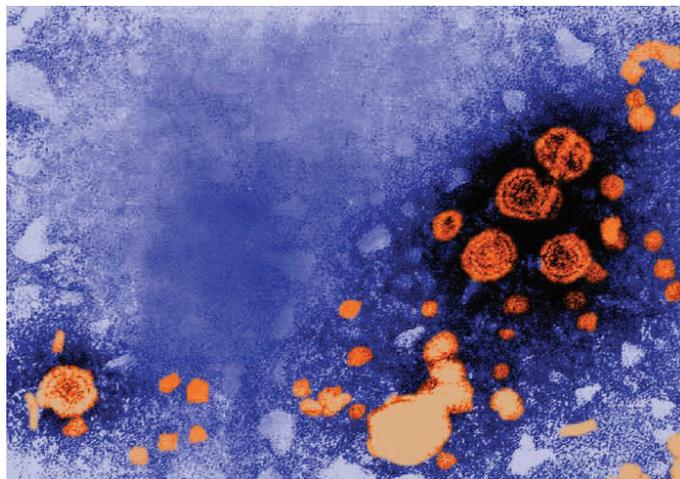


Public Image Library, CDC / Judy Schmidt, photo credit, James Gathany.

Hepatitis

Hepatitis is an inflammation of the liver and can have both infectious and non-infectious causes. Infectious causes can include viral, bacterial, or protozoan. Non-infectious causes include excessive alcohol use and certain drug toxicities (such as isoniazid which may be used to treat active tuberculosis infections).

Presented in this section are data on acute (newly acquired) viral hepatitis caused by two distinct viruses (hepatitis A virus and hepatitis B virus). These two viruses differ not only in their physical structure, but also in important epidemiologic characteristics such as their mode of transmission.



Hepatitis B virions. Public Image Library, CDC / Dr. Erskine Palmer.

Hepatitis, Viral-Type A, Acute

Acute Viral Hepatitis A in Davidson County

- In 2009, only 1 case of acute viral hepatitis A was reported in Davidson County.
- From 2000 to 2009, the rate of acute viral hepatitis A has decreased from a high of 8.1 per 100,000 in 2001 to fewer than 1 per 100,000 in 2008 and 2009.
- Since 2002, Davidson County has met the goal set out by Healthy People 2010 of fewer than 4.5 cases of viral hepatitis A per 100,000.
- Rates of viral hepatitis A incidence have declined across the country since hepatitis A vaccine was first licensed in 1995.

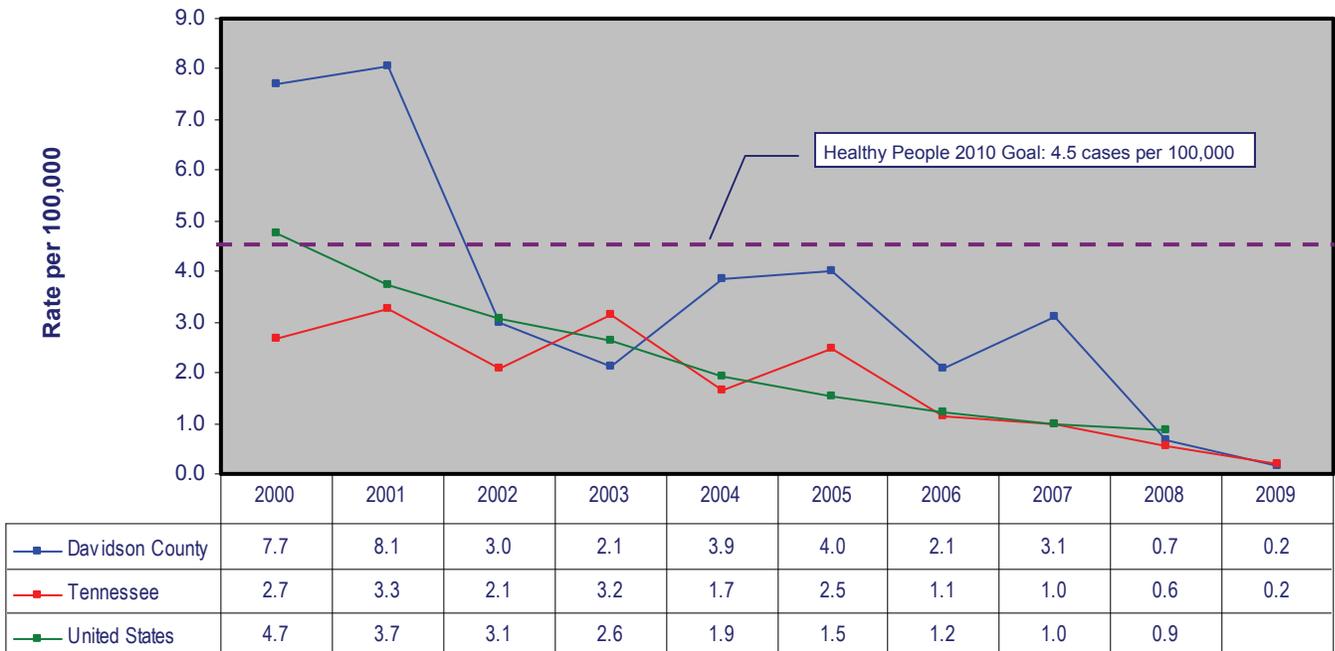
Infectious agents: hepatitis A virus (HAV)

Transmission: person-to-person via fecal oral route, foodborne, waterborne

Incubation period: usually 28-30 days

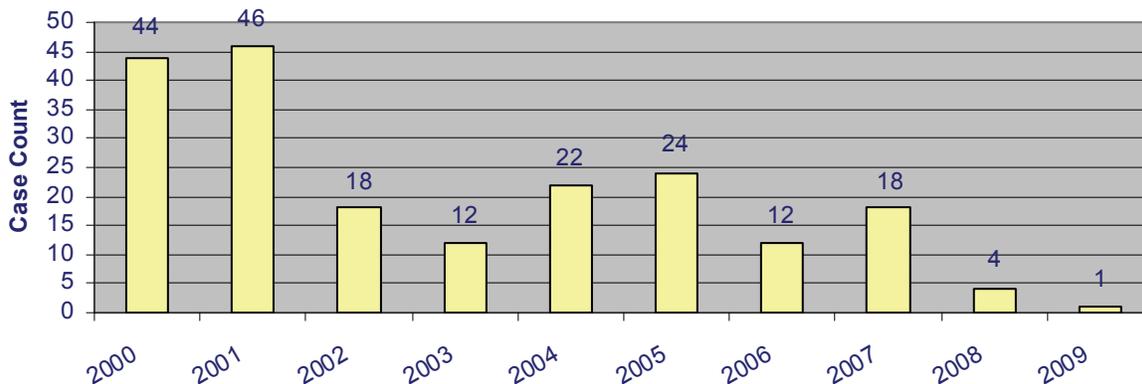
Symptoms: fever, malaise, anorexia, nausea, abdominal pain, dark urine, jaundice

Acute Viral Hepatitis A Incidence, Davidson County, Tennessee, and United States, 2000-2009



*Rate may be unstable

Reported Acute Viral Hepatitis A Cases by Year, Davidson County, 2000-2009



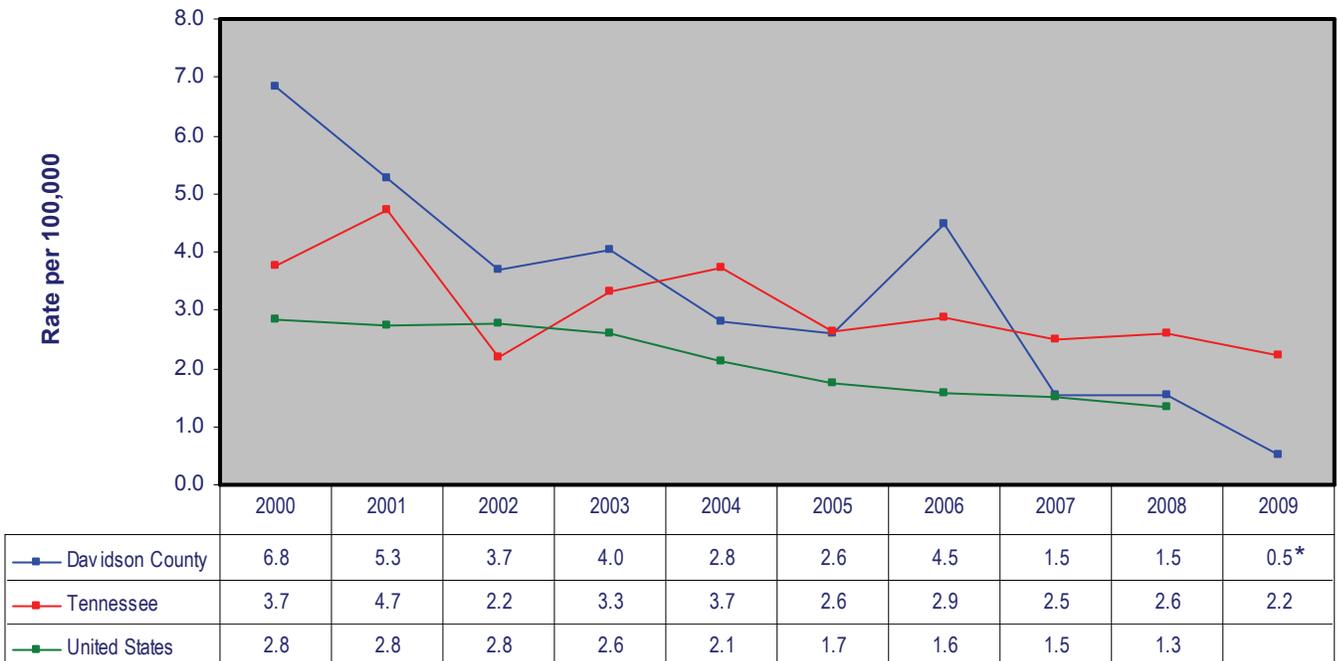
Hepatitis, Viral-Type B, Acute

Acute Viral Hepatitis B in Davidson County

- Three (3) cases of acute viral hepatitis B were reported among Davidson County residents in 2009.
- From 2000 to 2009, the rate of acute viral hepatitis B has decreased from a high of 6.8 cases per 100,000 in 2000 to fewer than 1.0 per 100,000 in 2009.
- In the 3 years from 2007 to 2009, Davidson County received 23 reports of acute viral hepatitis B.
- Among those aged 19-24 years, 2 cases were reported from 2007 to 2009 (or 1.4 cases per 100,000) which is fewer than the goal set out by Healthy People 2010 of fewer than 1.8 cases per 100,000.
- Among those aged 25 to 39 years, 10 cases were reported from 2007 to 2009 (or 2.4 cases per 100,000) which is fewer than the goal set out by Healthy People 2010 of fewer than 5.2 cases per 100,000.
- Among those 40 years and older, 9 cases were reported from 2007 to 2009 (or 1.2 cases per 100,000) which is fewer than the goal set out by Healthy People 2010 of fewer than 3.7 cases per 100,000.

Infectious agents: hepatitis B virus (HBV)
Transmission: bloodborne, sexual contact, sharing of needles and other drug preparation equipment, sharing of razors or toothbrushes, mother-to-child during childbirth
Incubation period: average 90 days (range: 60-150 days)
Symptoms: (symptoms may or may not be present & vary by age*) fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, joint pain, jaundice
Age-dependency: likelihood of symptoms varies with age; <1% of those under 1 year, 5-10% of those 1 to 4 years, and 30-50% of those 5 years & older develop symptoms

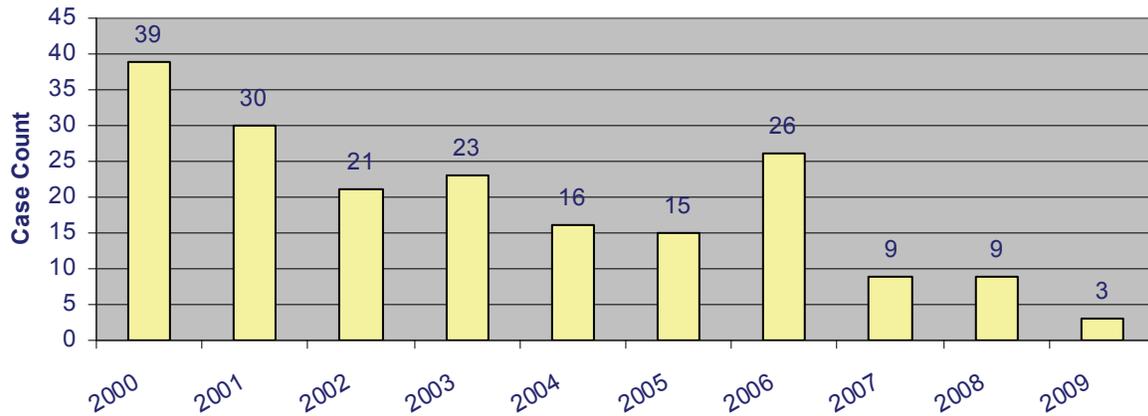
Acute Viral Hepatitis B Incidence, Davidson County, Tennessee, and United States, 2000-2009



*Rate may be unstable

Hepatitis, Viral-Type B, Acute

Reported Acute Viral Hepatitis B Cases by Year, Davidson County, 2000-2009



Healthy People Goals: Viral Hepatitis B Cases, Acute by Select Age Group

	HP 2010 National Goals	Davidson County, 2007-2009
Objective	Rate per 100,000	Rate per 100,000 (total cases)
Age Group (yrs)		
19 – 24	1.8	1.4 (2)
25 – 39	5.2	2.4 (10)
40+	3.7	1.2 (9)

*Rate may be unstable

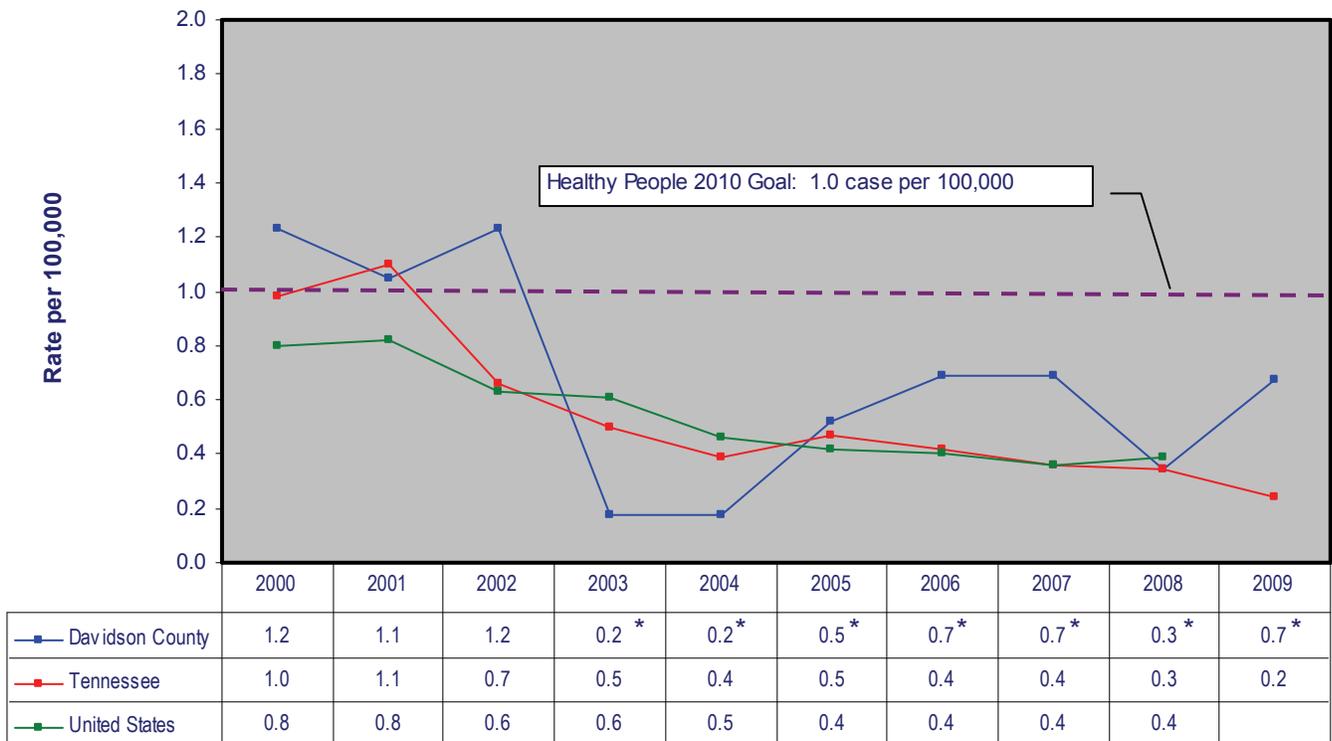
Meningococcal Disease (*Neisseria meningitidis*)

Meningococcal Disease (*N. meningitidis*) in Davidson County

- In 2009, 4 cases of meningococcal disease were reported among county residents (2 were among young adults aged 15 to 34; 2 were among older adults aged 45 to 64).
- Since 2003, the rate of meningococcal disease has been below the Healthy People goal of fewer than 1.0 case per 100,000.
- Statewide, the rate of disease has been steadily decreasing since 2001.

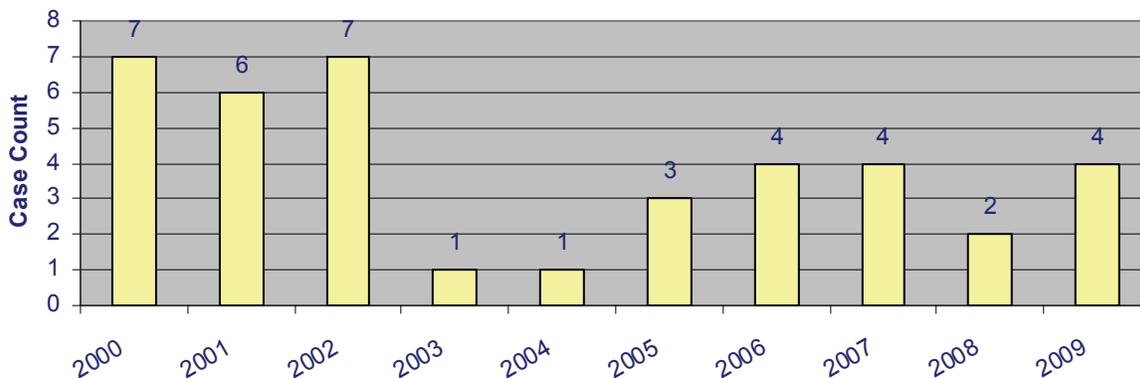
Infectious agents: serogroups of the bacteria species *Neisseria meningitidis*
Transmission: person-to-person through direct contact with respiratory tract secretions
Incubation period: 2-10 days
Symptoms: rapid progression of fever, chills, malaise, myalgia, prostration, rash; can result in meningitis and/or septicemia

Meningococcal Disease Incidence, Davidson County, Tennessee, and United States, 2000-2009



*Rate may be unstable

Reported Meningococcal Disease Cases by Year, Davidson County, 2000-2009



Pertussis

Pertussis in Davidson County

- In 2009, 19 cases of pertussis were reported among county residents; 8 cases (or 42.1%) were reported among those under 5 years of age (a rate of 17.9 cases per 100,000).
- A 2009 study conducted by the Tennessee Department of Health with participation of MPHD Immunization Program staff estimated full DTap (diphtheria, tetanus, and pertussis) vaccine coverage (4 doses by 24 months) among Davidson County infants to be 82.1%. Similarly, coverage statewide was estimated at 84.1%.
- Healthy People 2010 goal for full DTap vaccine coverage (4 doses by 24 months) is 90.0% highlighting an area of needed improvement locally and statewide, and an area where TDH and MPHD have focused outreach efforts in recent years.

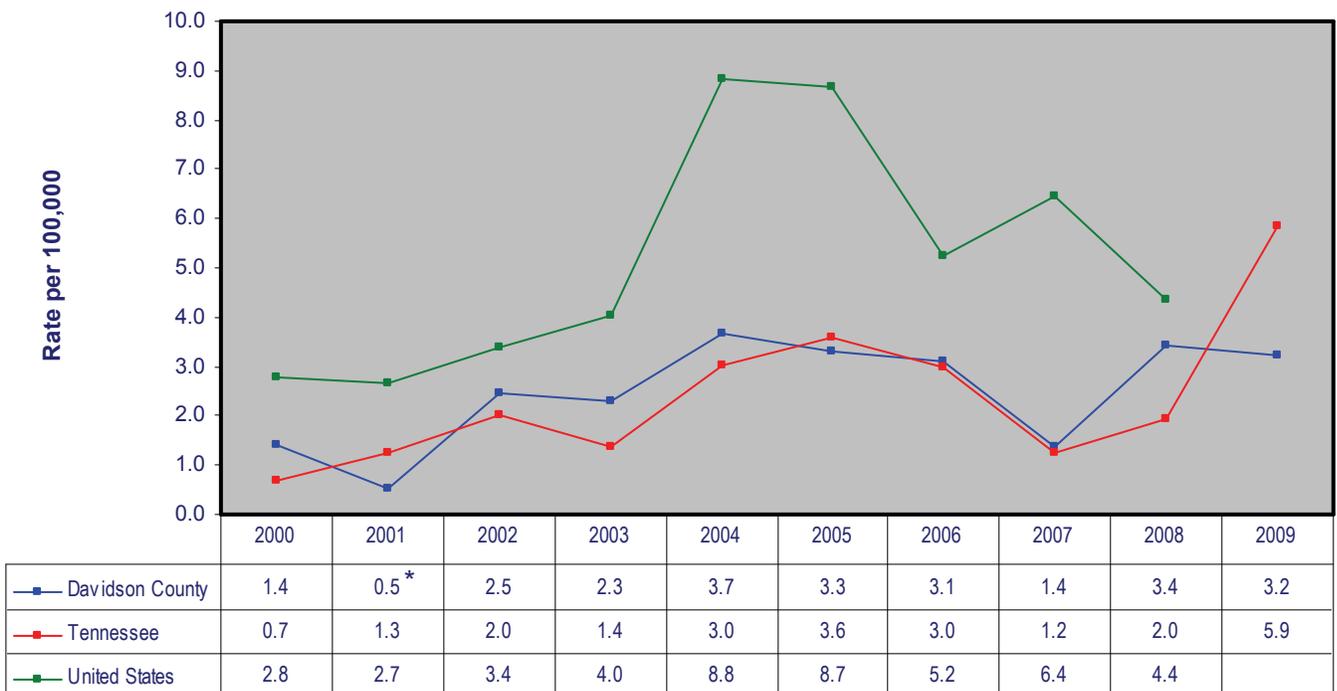
Infectious agents: bacteria species
Bordetella pertussis

Transmission: direct contact, person-to-person by inhalation of respiratory tract secretions

Incubation Period: 7-10 days

Symptoms: begins with mild cold-like symptoms of the upper respiratory tract, progresses to cough spasms and characteristic whoop-sound, coughing may induce vomiting

Pertussis Incidence, Davidson County, Tennessee, and United States, 2000-2009



*Rate may be unstable

Reported Pertussis Cases by Year, Davidson County, 2000-2009

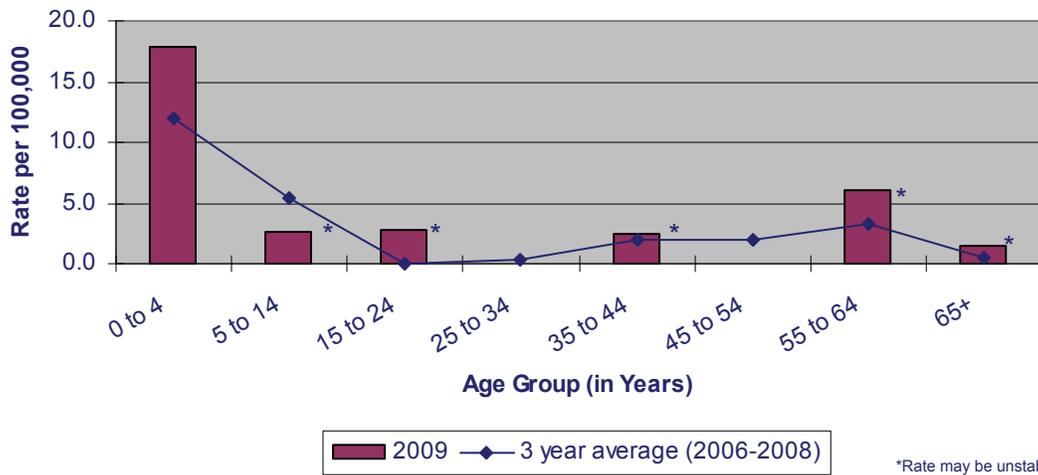


Pertussis

Reported Cases of Pertussis in Davidson County and County Demographics, 2009

Variable	Pertussis Cases		Davidson County Population
	N	%	%
Gender			
Male	10	52.6	49.0
Female	9	47.3	51.0
Age Group (yrs)			
Under 5	8	42.1	7.6
5 – 14	2	15.8	12.7
15 – 24	2	10.5	11.9
25 – 34	0	10.5	16.3
35 – 44	2	0.0	14.2
45 – 54	0	10.5	15.0
55 – 64	4	5.3	11.0
65+	1	5.3	11.3

Incidence of Pertussis by Age Group, Davidson County, 2009



*Rate may be unstable



Public Image Library, CDC / Judy Schmidt, photo credit, James Gathany.

Salmonellosis

Salmonellosis in Davidson County

- In 2009, 39% of local salmonellosis cases (26 of 66) were reported during the months June and July which follows a similar pattern seen locally over the previous 3 years (2006-2008).
- The rate of salmonellosis incidence was highest among those aged 1 to 4 years of age, among whom 35.8 per 100,000 children were infected.
- Children 4 years old and younger made up 24% of all cases (16 of 66).
- Those 25 to 44 years of age made up over 36% of all cases (24 of 66), at a rate of 13.3 cases per 100,000.
- Children in child-care settings are a significant risk group in the U.S. often due to unsupervised personal hygiene practices.

Infectious agents: serotypes of the bacterial species *Salmonella enterica*; some clinically important serotypes include *S. Typhi*, *S. Typhimurium*, *S. Paratyphi*, *S. Enteritidis*, and *S. Newport*

Transmission: foodborne (particularly undercooked poultry, raw milk, and contaminated packaged foods), waterborne, animal contact

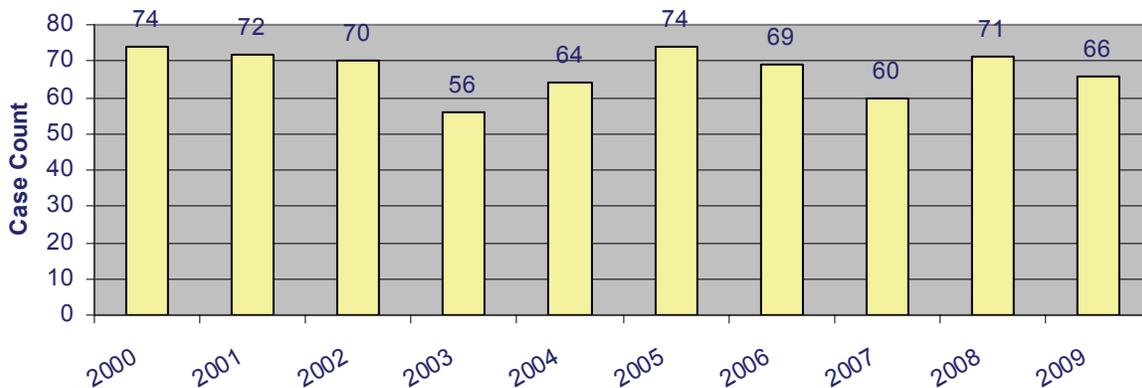
Incubation Period: usually 12-36 hours

Symptoms: diarrhea, abdominal cramps, fever

Salmonellosis Incidence, Davidson County, Tennessee, and United States 2000-2009



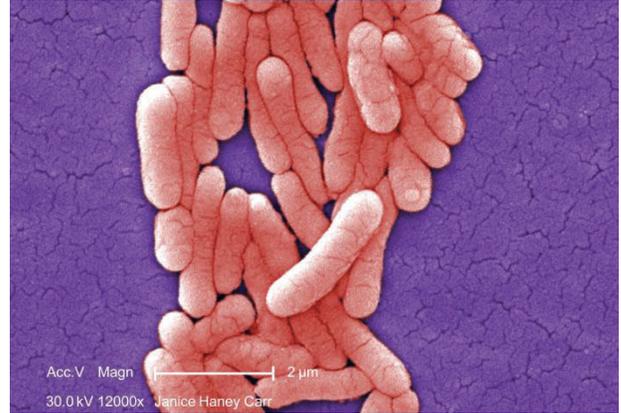
Reported Salmonellosis Cases by Year, Davidson County, 2000-2009



Salmonellosis

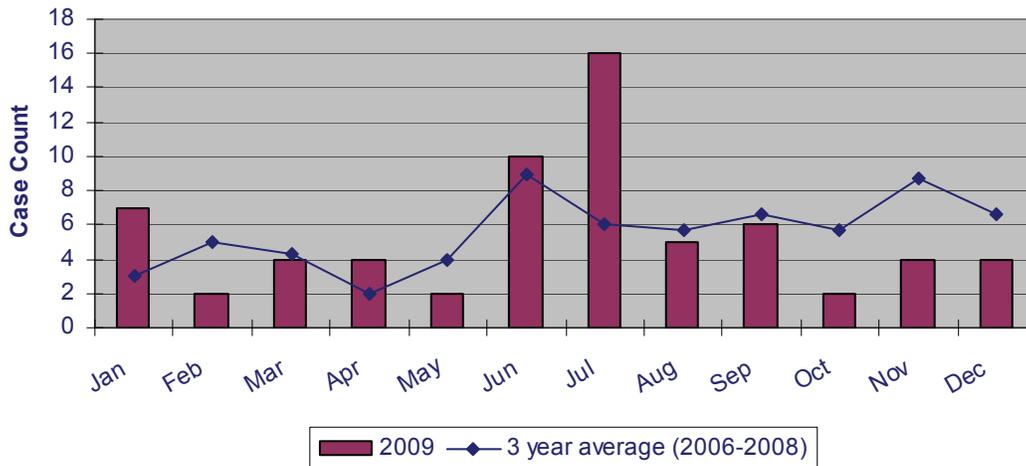
Reported Cases of Salmonellosis in Davidson County and County Demographics, 2009

Variable	Salmonellosis Cases		County Population
	N	%	%
Gender			
Male	27	40.9	49.0
Female	39	59.1	51.0
Age Group (yrs)			
Under 5	16	24.2	7.6
5 – 14	6	9.1	12.7
15 – 24	4	6.1	11.9
25 – 34	14	21.2	16.3
35 – 44	10	15.2	14.2
45 – 54	7	10.6	15.0
55 – 64	4	6.1	11.0
65+	5	7.6	11.3



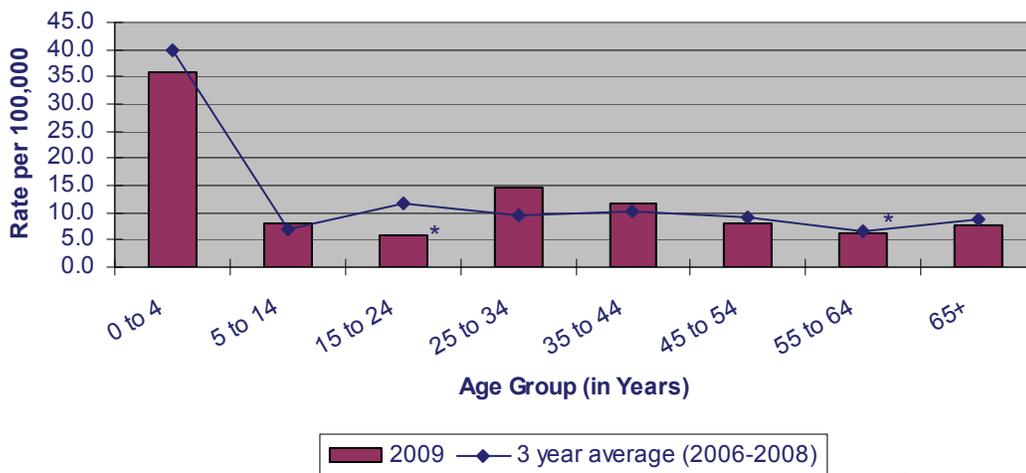
Salmonella typhimurium. Public Image Library, CDC / Dr. Bette Jensen.

Reported Salmonellosis Cases by Month of Onset[§], Davidson County, 2009



[§]If date of onset was unavailable, the following dates were used as surrogates for onset: date of diagnosis, date of specimen collection, and date of report receipt by MPHDP.

Incidence of Salmonellosis by Age Group, Davidson County, 2009



*Rate may be unstable

Shigellosis

Shigellosis in Davidson County

- In April and May of 2009, Davidson County experienced a seasonal high in cases of shigellosis which differs from what has been seen locally in the 3 years prior (2006-2008), indicating that a seasonal pattern cannot be demonstrated.
- The rate of shigellosis incidence was highest among those under 5 years of age, among whom 114.1 per 100,000 children were infected.
- Children 14 and younger made up 71% of all cases (87 of 123), at a rate of 72.5 cases per 100,000.
- Children in child-care settings are a significant risk group in the U.S. often due to unsupervised personal hygiene practices.
- *S. sonnei* was the predominant species isolated, comprising 96.8% of samples (CDC estimates 72% of all U.S. cases are due to *S. sonnei*).
- The incidence of shigellosis in Davidson County and the state of Tennessee has varied from year-to-year, although it has been reported to follow a five-year cycle of intermittent increase by Tennessee Department of Health.
- Investigations of all reported cases in Davidson County in 2005 and 2009 did not indicate common exposures that would suggest any large-scale outbreaks.

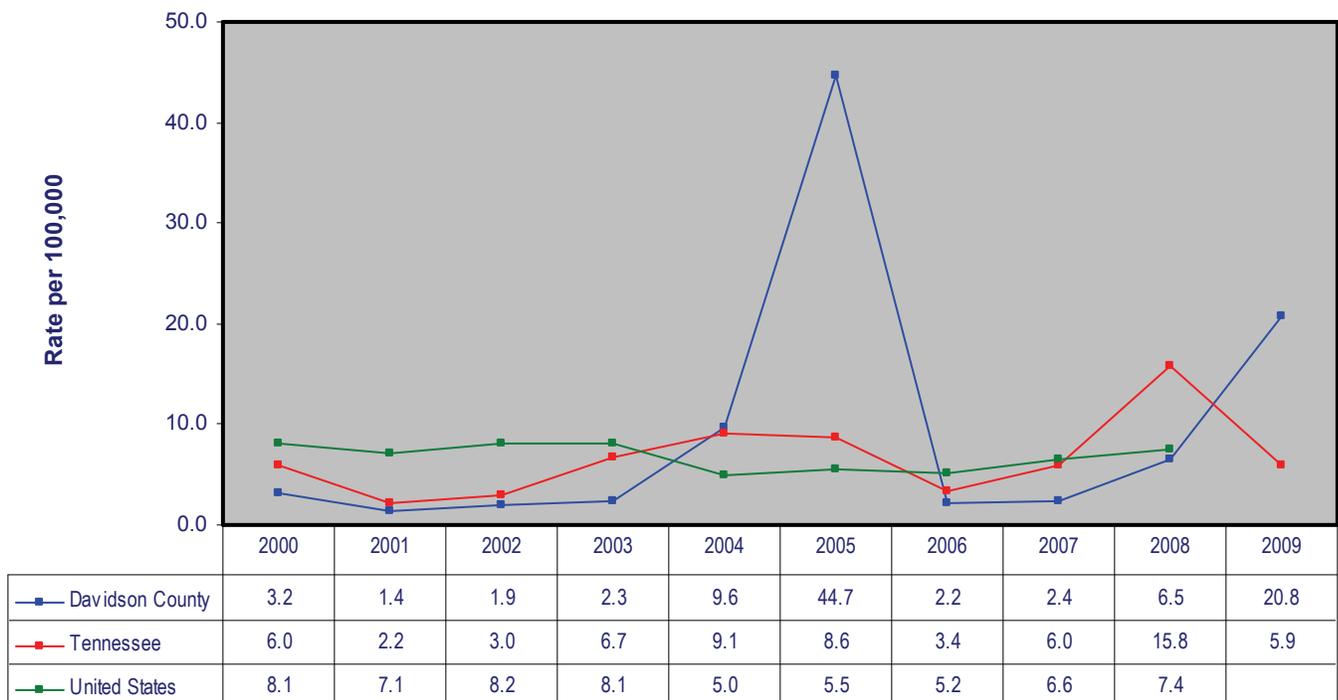
Infectious agents: the bacterial genus *Shigella* is comprised of 4 species or serotypes – *Shigella dysenteriae* (Group A), *S. flexneri* (Group B), *S. boydii* (Group C), and *S. sonnei* (Group D)

Transmission: person-to-person via fecal-oral route, foodborne, waterborne, sexual contact

Incubation Period: usually 1-3 days

Symptoms: watery or bloody diarrhea, abdominal pain, fever, malaise

Shigellosis Incidence, Davidson County, Tennessee, and United States, 2000-2009



Shigellosis

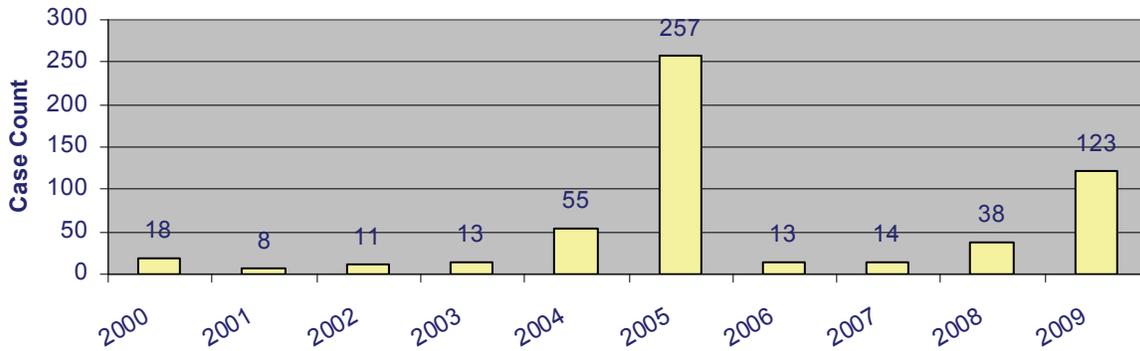
Reported Cases of Shigellosis in Davidson County and County Demographics, 2009

Variable	Shigellosis Cases		County Population
	N	%	%
Gender			
Male	48	39.0	49.0
Female	75	61.0	51.0
Age Group (yrs)			
Under 5	51	41.5	7.6
5 – 14	36	29.3	12.7
15 – 24	17	13.8	11.9
25 – 34	7	5.7	16.3
35 – 44	2	1.6	14.2
45 – 54	2	1.6	15.0
55 – 64	5	4.1	11.0
65+	3	2.4	11.3

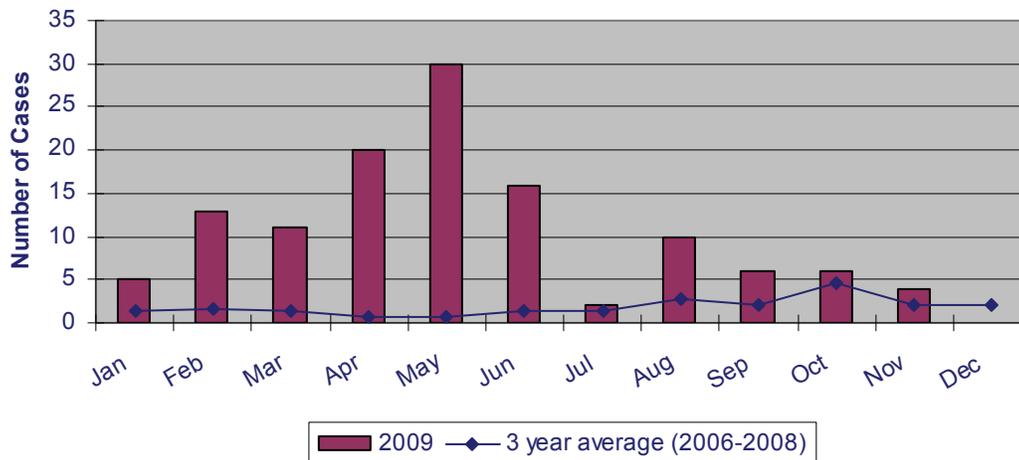


Public Image Library, CDC / Dawn Arlotta, photo credit, Cade Martin.

Reported Shigellosis Cases by Year, Davidson County, 2000-2009



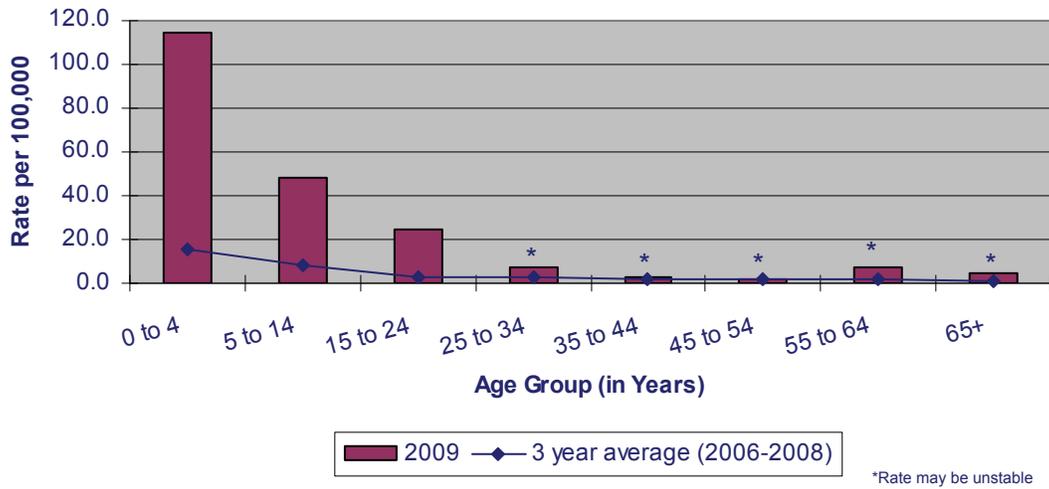
Reported Shigellosis Cases by Month of Onset[§], Davidson County, 2009



[§]If date of onset was unavailable, the following dates were used as surrogates for onset: date of diagnosis, date of specimen collection, and date of report receipt by MPHD.

Shigellosis

Incidence of Shigellosis by Age Group, Davidson County, 2009



Public Image Library, CDC / Dawn Arlotta, photo credit, Cade Martin.

Outbreak Investigations

Outbreak Investigations in Davidson County

In 2009, MPH D Notifiable Diseases Staff collaborated with both internal (Food Division) and external partners (TDH CEDS and Laboratory Services) to investigate 8 infectious disease outbreaks involving either foodborne or community exposure transmission:

- Two (2) separate *Salmonella* outbreaks which both involved restaurant exposures and were associated with different serotypes of *Salmonella enterica* (S. Newport and S. Enteritidis)
- Six (6) norovirus outbreaks, of which 4 were determined to be person-to-person and occurred in either community settings or social gatherings. Two (2) were determined to be food-associated.

Presented in the next two pages is a brief description of viral gastroenteritis followed by details from the investigation of one norovirus outbreak which occurred in late December of 2009 and into 2010 among staff and residents of a long term care facility in Davidson County.

Acute Viral Gastroenteritis due to Noroviruses

Acute Viral Gastroenteritis—Quick Facts

- Viral gastroenteritis (“stomach flu”) outbreaks are common in late fall and early winter especially among members of closed communities such as long-term care facilities and cruise ships.
- Acute viral gastroenteritis outbreaks commonly caused by noroviruses which are highly contagious and transmitted person-to-person from contact with aerosolized viral particles present in vomitus and diarrhea.
- Contamination of environmental surfaces can also act as a transmission source.
- Highly resistant to most disinfectants, diluted bleach solutions work best.
- Illness is generally mild to moderate in healthy adults, but sensitive populations such as the elderly, children, and those with other health conditions may experience complications from dehydration.

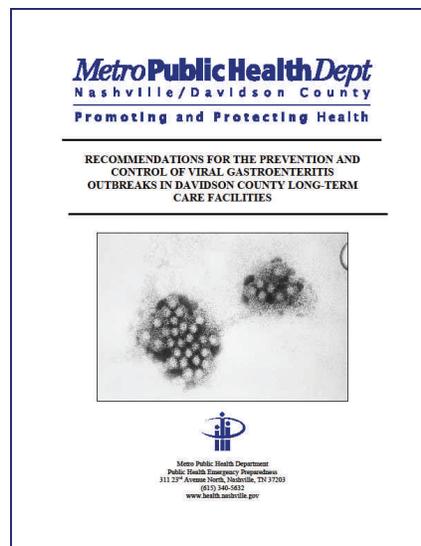
Infectious agents: Caliciviruses such as norovirus types

Transmission: person-to-person, environmental contamination (very contagious)

Incubation period: 12-48 hours

Symptoms: nausea, vomiting, diarrhea, abdominal pain, headache, low-grade fever

For specific guidance and recommendations on prevention and control of acute viral gastroenteritis outbreaks in closed-community settings, see “Recommendations for the Prevention and Control of Viral Gastroenteritis Outbreaks in Davidson County Long-Term Care Facilities” available at <http://health.nashville.gov/HealthData/Resources.htm>.



A Norovirus Outbreak Investigation in Detail

Summary

Metro Public Health Department conducted an investigation at Assisted Living Facility H after receiving a report of an outbreak of acute gastrointestinal illness at the facility. From December 27, 2009 to January 13, 2010, a total of 48 residents and staff (29 and 19, respectively) reported acute gastrointestinal illness. Three stool specimens were tested at the state laboratory, 2 of which were positive for norovirus G2 by polymerase chain reaction (PCR). This outbreak lasted 18 days and occurred in at least 3 distinct waves.

Investigation

Tuesday, January 5, 2010

MPHD received a call from the Executive Director of a long-term care facility reporting an outbreak of acute gastrointestinal illness at the facility. It was reported that the outbreak began with several cases on the previous Saturday, January 2, 2010. Illness presented with sudden onset of vomiting and/or diarrhea which typically lasted 24 hours (minor symptoms continued for 3 to 4 days). An absence of fever was noted. At that time, it was reported that 18 residents and 7 staff (including 3 food service personnel) had become ill (16 over the previous two days, 1/5/2010-1/6/2010, 10 residents and 6 staff). One resident was hospitalized at that time. The facility had instituted control measures including case isolation, meals delivered to ill people on disposable dinnerware, posting of signage stressing hand hygiene, closing of public restrooms. MPH recommended the complete closure of dining facility and delivery of all meals to individuals as well as suspension of all communal activities. Both recommendations were instituted. It was also recommended that ill staff should not report for work until they were symptom-free for at least 48 hours (the facility was operating on a 24 hour symptom-free and doctor's note return policy). Written recommendations for the prevention and control of acute gastrointestinal illness in long-term care facilities were shared with the facility.

MPHD Food Division and MPH Public Facilities Division were notified and offered to assist if requested by the facility, but neither Division has regulatory authority. The facility director confirmed that the state licensing board had been notified of the outbreak. Based upon the initial report, MPH and the facility focused on this being an outbreak of acute viral gastroenteritis. MPH Epidemiology Division informed TDH CEDS Branch of the investigation and the plan to collect stool samples for testing at the state laboratory. Based upon the initial epidemiology and reported symptomology, testing would first focus on norovirus.

Wednesday, January 6

A follow up telephone call with the facility revealed one additional new case in a resident who had been taken to the hospital. MPH Notifiable Disease staff contacted the hospital Infection Control Nurses for information regarding the two residents brought to the hospital. Both had been admitted. The facility decided to close the entire dining facility for the next 48 hours as a preventive measure.

Thursday, January 7

MPHD Epidemiology staff visited the facility. No new cases had presented since the day before. The Executive Director shared a basic line list which included information on all ill residents and staff: date of onset, duration of illness, floor of residence or work area, and for staff, type of work generally performed. Symptoms experienced were listed for some of the ill residents. Stool collection kits were delivered.

Friday, January 8

MPHD Epidemiology again visited the facility. Three additional cases were reported (two residents, one staff member – a receptionist). Three stool specimens were picked up and submitted to TDH Laboratory Services for norovirus testing. Testing would be performed on Monday, January 11.

Monday, January 11

A follow up telephone call with the facility revealed 5 new presentations over the weekend, all among staff members. These staff members were those that provided direct patient care and those that were involved in cleaning and disinfecting contaminated areas of the facility. Ill staff members were still required to stay away

A Norovirus Outbreak Investigation in Detail

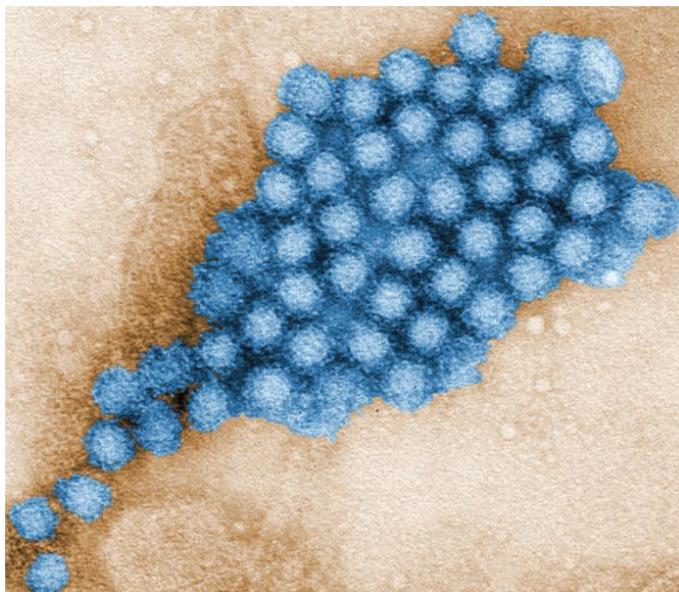
from the facility until at least 24 hours after symptoms had resolved (it was reiterated that 48 hours was the recommended guidance). Lab results indicated 2 of 3 stool specimens were positive for norovirus G2.

Tuesday, January 12 – Tuesday, January 18

The Executive Director was contacted daily to assess whether current control measures were effective. On Tuesday, 1/12/2010, 5 new illnesses were reported, all residents. On Wednesday, 1/13/2010, 2 new illnesses were reported, both among staff members.

Analysis & Discussion

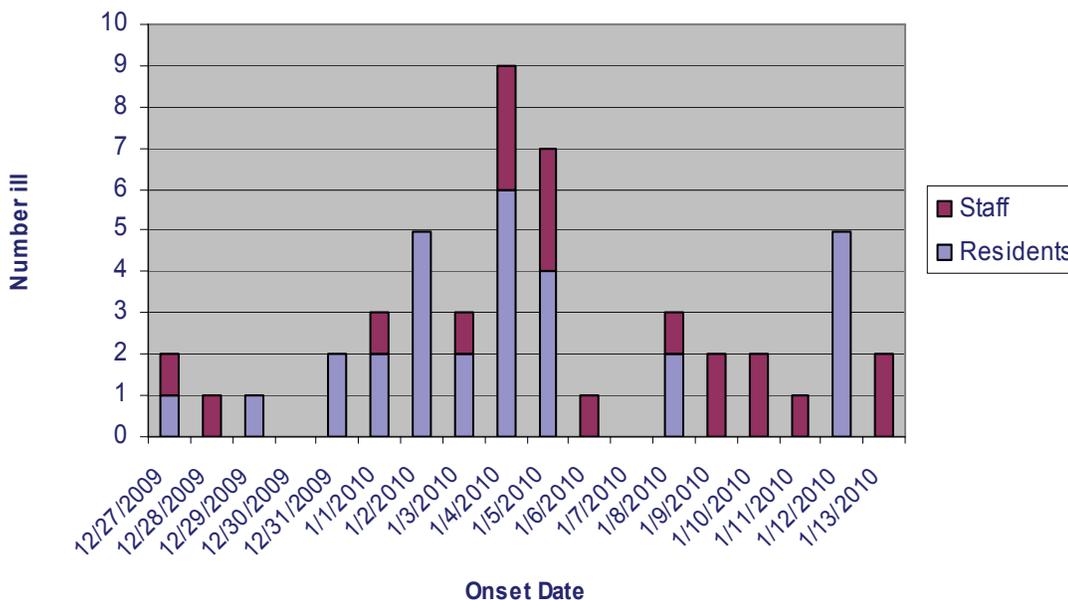
Onset	Residents	Staff	All
27-Dec	1	1	2
28-Dec	0	1	1
29-Dec	1	0	1
30-Dec	0	0	0
31-Dec	2*	0	2
1-Jan	2	1	3
2-Jan	5	0	5
3-Jan	2	1	3
4-Jan	6	3	9
5-Jan	4	3	7
6-Jan	0	1	1
7-Jan	0	0	0
8-Jan	2	1	3
9-Jan	0	2	2
10-Jan	0	2	2
11-Jan	0	1	1
12-Jan	5*	0	5
13-Jan	0	2	2
	30*	19	49*



Norovirus virions. Public Image Library, CDC / Charles D. Humphrey.

*Note – one resident reported symptoms on both 12/31/2009 and 1/12/2010

Norovirus G2 Outbreak at Assisted Living Facility H



A Norovirus Outbreak Investigation in Detail

An epidemiologic curve reveals at least three distinct peaks in this outbreak. From speaking with the Nursing Director, it appears this outbreak started with illness presenting on December 27th among one resident and one nursing staff member who had direct contact with the resident. Who presented with symptoms first, is unclear. Over the next two days, one additional resident (lived on the same floor as the first ill resident) and one additional staff member presented with gastrointestinal symptoms. This staff member is a member of the kitchen staff. The role this person may have played in perpetuating the outbreak to follow is also unclear.

On December 31st, a New Year's Eve party was hosted in the dining facility. It is suspected that this perpetuated the larger outbreak, as those who were ill may have contaminated shared food items or played a role in direct person-to-person spread of the virus. From December 31st to January 6th, 30 new illnesses were reported (21 residents from throughout the facility, and 9 staff members, including healthcare and kitchen staff).

No new illnesses were reported on January 7th, but on January 8th and over the three-day weekend (January 9th-11th) it appears that staff involved in infection control and sanitation of contaminated areas disproportionately reported illness with 5 staff members reporting illness over the weekend. Five (5) new cases among residents were reported on Tuesday, January 12th (this included one of the initially hospitalized residents who had first become ill on December 31st who presented with recurrent or unresolved illness). It would appear that the ill staff members likely played a role in these later 5 illnesses among residents. On Wednesday, January 13th, the final two cases were identified among 2 staff members.

During this outbreak, a total of 49 illnesses were reported among 48 individuals (one resident who reported illness twice may have had a recurrent or unresolved illness or suffered similar symptoms due to different causes 12 days apart). This occurred over the course of 18 days and affected 29 residents and 19 staff members. Illness among residents occurred on multiple floors and wings. Staff members in multiple job types were affected including healthcare workers, kitchen staff, administrators and clerical staff, and housekeeping and maintenance personnel.

While investigating this extended outbreak, it was learned by this investigator that some residents of long-term care facilities have visiting home-health workers who attend to them and do not work directly for the facility. The role these visiting staff may play in cross-contamination of multiple facilities is important to consider in providing future guidance to long-term care facilities trying to control acute gastroenteritis outbreaks. Keeping track of illness in this cohort is as important, albeit possibly more challenging, as it is among permanent staff of the facility.

It is interesting to note the lack of illness among residents of the secured unit for Alzheimer's patients at Assisted Living Facility H. The facility has dedicated nursing staff for this separate unit, but early in the outbreak suspended all roaming staff between the two units and even changed routine check in/out procedures to prevent cross-contamination. It is suspected this measure played a critical role in isolating the outbreak to the assisted living unit residents and personnel only.

Appendix I - Reporting Requirements in Tennessee

Tennessee Department of Health Reportable Diseases and Events

The diseases and events listed below are declared to be communicable and/or dangerous to the public and are to be reported to the local health department by all hospitals, physicians, laboratories, and other persons knowing of or suspecting a case in accordance with the provision of the statutes and regulations governing the control of communicable diseases in Tennessee.

Category 1A: Requires immediate telephonic notification (24 hours a day, 7 days a week), followed by a written report using the PH-1600 within 1 week.

[002] Anthrax (<i>Bacillus anthracis</i>) ^B	[516] Novel Influenza A
[005] Botulism-Foodborne (<i>Clostridium botulinum</i>) ^B	[032] Pertussis (Whooping Cough)
[004] Botulism-Wound (<i>Clostridium botulinum</i>)	[037] Rabies: Human
[505] Disease Outbreaks (e.g., foodborne, waterborne, healthcare, etc.)	[112] Ricin Poisoning ^B
[108] Encephalitis, Arboviral: Venezuelan Equine ^B	[132] Severe Acute Respiratory Syndrome (SARS)
[023] Hantavirus Disease	[107] Smallpox ^B
[096] Measles-Imported	[110] Staphylococcal Enterotoxin B (SEB)
[026] Measles-Indigenous	Pulmonary Poisoning ^B
[095] Meningococcal Disease (<i>Neisseria meningitidis</i>)	[111] Viral Hemorrhagic Fever ^B

Category 1B: Requires immediate telephonic notification (next business day), followed by a written report using the PH-1600 within 1 week.

[006] Brucellosis (<i>Brucella species</i>) ^B	[102] Meningitis-Other Bacterial
[010] Congenital Rubella Syndrome	[031] Mumps
[011] Diphtheria (<i>Corynebacterium diphtheriae</i>)	[033] Plague (<i>Yersinia pestis</i>) ^B
[121] Encephalitis, Arboviral: California/LaCrosse Serogroup	[035] Poliomyelitis-Nonparalytic
[123] Encephalitis, Arboviral: Eastern Equine	[034] Poliomyelitis-Paralytic
[122] Encephalitis, Arboviral: St. Louis	[119] Prion disease-variant Creutzfeldt Jakob Disease
[124] Encephalitis, Arboviral: Western Equine	[109] Q Fever (<i>Coxiella burnetii</i>) ^B
[506] Enterobacteriaceae, Carbapenemase-producing	[040] Rubella
[053] Group A Streptococcal Invasive Disease (<i>Streptococcus pyogenes</i>)	[041] Salmonellosis: Typhoid Fever (<i>Salmonella Typhi</i>)
[047] Group B Streptococcal Invasive Disease (<i>Streptococcus agalactiae</i>)	[131] <i>Staphylococcus aureus</i> : Vancomycin non-sensitive – all forms
[054] <i>Haemophilus influenzae</i> Invasive Disease	[075] Syphilis (<i>Treponema pallidum</i>): Congenital
[016] Hepatitis, Viral-Type A acute	[519] Tuberculosis, confirmed and suspect cases of active disease (<i>Mycobacterium tuberculosis</i> complex)
[513] Influenza, pediatric deaths	[113] Tularemia (<i>Francisella tularensis</i>) ^B
[515] Melioidosis (<i>Burkholderia pseudomallei</i>)	

Category 2: Requires written report using form PH-1600 within 1 week.

[501] Babesiosis	[001] Cryptosporidiosis (<i>Cryptosporidium species</i>)
[003] Botulism-Infant (<i>Clostridium botulinum</i>)	[106] Cyclosporiasis (<i>Cyclospora species</i>)
[007] Campylobacteriosis (including EIA or PCR positive stools)	[504] Dengue Fever
[503] Chagas Disease	[116] Ehrlichiosis-HGE (<i>Anaplasma phagocytophilum</i>)
[069] Chancroid	[051] Ehrlichiosis-HME (<i>Ehrlichia chaffeensis</i>)
[055] <i>Chlamydia trachomatis</i> -Genital	[117] Ehrlichiosis/Anaplasmosis-Other
[057] <i>Chlamydia trachomatis</i> -Other	[060] Gonorrhea-Genital (<i>Neisseria gonorrhoeae</i>)
[056] <i>Chlamydia trachomatis</i> -PID	[064] Gonorrhea-Ophthalmic (<i>Neisseria gonorrhoeae</i>)
[009] Cholera (<i>Vibrio cholerae</i>)	

^BPossible Bioterrorism Indicators

Effective 04/14/2010

Appendix I - Reporting Requirements in Tennessee

Category 2: Requires written report using form PH-1600 within 1 week (continued).

[061] Gonorrhea-Oral (<i>Neisseria gonorrhoeae</i>)	[130] <i>Staphylococcus aureus</i> : Methicillin resistant Invasive Disease
[063] Gonorrhea-PID (<i>Neisseria gonorrhoeae</i>)	[518] <i>Streptococcus pneumoniae</i> Invasive Disease (IPD)
[062] Gonorrhea-Rectal (<i>Neisseria gonorrhoeae</i>)	[074] Syphilis (<i>Treponema pallidum</i>): Cardiovascular
[133] Guillain-Barré syndrome	[072] Syphilis (<i>Treponema pallidum</i>): Early Latent
[058] Hemolytic Uremic Syndrome (HUS)	[073] Syphilis (<i>Treponema pallidum</i>): Late Latent
[480] Hepatitis, Viral-HbsAg positive infant	[077] Syphilis (<i>Treponema pallidum</i>): Late Other
[048] Hepatitis, Viral-HbsAg positive pregnant female	[076] Syphilis (<i>Treponema pallidum</i>): Neurological
[017] Hepatitis, Viral-Type B acute	[070] Syphilis (<i>Treponema pallidum</i>): Primary
[018] Hepatitis, Viral-Type C acute	[071] Syphilis (<i>Treponema pallidum</i>): Secondary
[021] Legionellosis (<i>Legionella</i> species)	[078] Syphilis (<i>Treponema pallidum</i>): Unknown Latent
[022] Leprosy [Hansen Disease] (<i>Mycobacterium leprae</i>)	[044] Tetanus (<i>Clostridium tetani</i>)
[094] Listeriosis (<i>Listeria</i> species)	[045] Toxic Shock Syndrome: Staphylococcal
[024] Lyme Disease (<i>Borrelia burgdorferi</i>)	[097] Toxic Shock Syndrome: Streptococcal
[025] Malaria (<i>Plasmodium</i> species)	[046] Trichinosis
[118] Prion disease-Creutzfeldt Jakob Disease	[101] Vancomycin resistant enterococci (VRE) Invasive Disease
[036] Psittacosis (<i>Chlamydia psittaci</i>)	[114] Varicella deaths
[105] Rabies: Animal	[104] Vibriosis (<i>Vibrio</i> species)
[039] Rocky Mountain Spotted Fever (<i>Rickettsia rickettsii</i>)	[125] West Nile virus Infections-Encephalitis
[042] Salmonellosis: Other than <i>S. Typhi</i> (<i>Salmonella</i> species)	[126] West Nile virus Infections-Fever
[517] Shiga-toxin producing <i>Escherichia coli</i> (including Shiga-like toxin positive stools, <i>E. coli</i> O157 and <i>E. coli</i> non-O157)	[098] Yellow Fever
[043] Shigellosis (<i>Shigella</i> species)	[103] Yersiniosis (<i>Yersinia</i> species)

Category 3: Requires special confidential reporting to designated health department personnel within 1 week.

[500] Acquired Immunodeficiency Syndrome (AIDS)	[512] Human Immunodeficiency Virus (HIV)
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Category 4: Laboratories and physicians are required to report all blood lead test results monthly and no later than 15 days following the end of the month.

[514] Lead Levels (blood)

Category 5: Events will be reported monthly (no later than 30 days following the end of the month) via the National Healthcare Safety Network (NHSN – see <http://health.state.tn.us/ceds/hai/index.htm> for more details); *Clostridium difficile* infections (Davidson County residents only) will also be reported monthly to the Emerging Infections Program (EIP).

[508] Healthcare Associated Infections, Central Line Associated Bloodstream Infections	[510] Healthcare Associated Infections, Methicillin resistant <i>Staphylococcus aureus</i> positive blood cultures
[509] Healthcare Associated Infections, <i>Clostridium difficile</i>	[511] Healthcare Associated Infections, Surgical Site Infections

The following pathogens do not need to be reported using form PH-1600, but a reference culture is required to be sent to the State Public Health Laboratory.

[502] <i>Burkholderia mallei</i>	[507] <i>Francisella</i> species
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^BPossible Bioterrorism Indicators

Appendix II - Resources

Nashville/Davidson County

Metro Public Health Department (MPHD)

www.nashville.gov

Division of Epidemiology

www.health.nashville.gov

www.health.nashville.gov/epidemiology.htm

Tennessee Department of Health (TDH)

Communicable & Environmental Disease Services

health.state.tn.us

Tennessee Reportable Disease Data

health.state.tn.us/ceds/notifiable.htm

health.state.tn.us/ceds/reports.htm

Centers for Disease Control and Prevention (CDC)

Nationally Notifiable Disease Case Definitions

www.cdc.gov

www.cdc.gov/ncphi/diss/nndss/casedef/case_definitions.htm

Council of State and Territorial Epidemiologists (CSTE)

CSTE Position Statements

www.cste.org

www.cste.org/dnn/Annual_Conference/PositionStatements/tabid/191/Default.aspx



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