City of Philadelphia
Department of Public Health

Annual Summary of Reportable Diseases and Conditions: Division of Disease Control, 2004

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Introduction

Overview
This document provides an epidemiological summary of conditions reported to the Division of Disease Control (DDC) in 2004. There are currently 65 medical conditions that health care providers or laboratories must report to the DDC. Here, we highlight the most commonly reported conditions in Philadelphia as well as any conditions that are of special public-health importance. Some conditions with few or no cases each year are not described in detail, but can be found in the summary of all reportable conditions (See Appendix C). Data on cases of HIV/AIDS and lead poisoning are reported separately by the divisions that handle those conditions. Electronic versions of this report (in pdf format) can be found here: http://www.phila.gov/health/units/ddc/html/annual_reports_ddc.html

Case definitions
For most reportable conditions, a standard reporting case definition has been set by the Centers for Disease Control and Prevention (CDC). These case definitions may differ from the criteria used to make a clinical diagnosis. For a full list of CDC case definitions, please visit this website: http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm

Reporting to PDPH
Please note that the list of reportable conditions has been revised and can be found at http://www.phila.gov/health/units/ddc/assets/applets/PDPH_Notifiable_List_2005-seal.pdf. Influenza (involving pediatric mortality or institutional outbreaks), severe acute respiratory syndrome (SARS), vancomycin-insensitive *Staphylococcus aureus*, invasive *Streptococcus pneumoniae*, varicella (including zoster), and West Nile virus have been added to the list. Toxoplasmosis is no longer reportable.

We want to thank the medical and laboratory communities for their disease reporting activities, and we encourage all providers to continue reporting these conditions to DDC. Reporting to DDC may be accomplished by telephone (215-685-6748); by fax (215-545-8362), or by mail (PDPH, DDC, 500 South Broad Street, Philadelphia, PA 19146). In addition, any report made through the PA-NEDSS system can be viewed by DDC. The latest version of the Notifiable Disease Case Report Form can be found in Appendix B of this report and at this web site: http://www.phila.gov/health/units/ddc/assets/applets/New_notifiable_disease_form.pdf

DDC response to disease reports
For some common conditions, such as hepatitis C and chlamydia, cases are counted and the data is used to describe the scope and incidence of infection citywide. If the testing was ordered by a private medical facility, no further contact is made with the patient or health-care provider. In other instances, the patient or provider may be contacted to confirm the diagnosis and verify treatment. In addition, an interview with the patient may be conducted to determine the source of infection and to guide interventions for disease prevention. When a patient must be contacted regarding an STD, the reporting health-care provider is called before the patient is contacted in order to confirm diagnosis, stage of infection, treatment, and status of partners.

Special notes on syphilis reports:
When DDC receives a report of infectious syphilis, and the laboratory report precedes the physician case reports, the physicians are contacted to confirm diagnosis, stage of infection and treatment. Patients diagnosed with infectious or early syphilis are then contacted confidentially by trained DDC staff and offered voluntary disease prevention and partner notification services. These efforts are designed to help patients avoid reinfection and to stop the spread of infection in the community. Case reports also allow DDC to maintain historical diagnostic and treatment information, which is often critical for proper patient management. For example, patients treated for syphilis may remain seropositive for decades after adequate treatment. Only through a comparison of quantitative serology results at time of initial treatment with subsequent test results can the current status of a patient with a history of syphilis be properly evaluated. DDC maintains these records and routinely assists health care providers and their patients to obtain this critical information, even when the patient has seen many different providers over the years.

How DDC can assist health-care providers
If you suspect a disease outbreak or if you suspect an infectious disease of urgent public health importance, DDC can help facilitate diagnostic testing and assist with infection control and disease management. To speak with a medical specialist, please call 215-685-6748. For urgent after-hours consultation, please call 215-686-1776 and ask for the Division of Disease Control on-call staff.

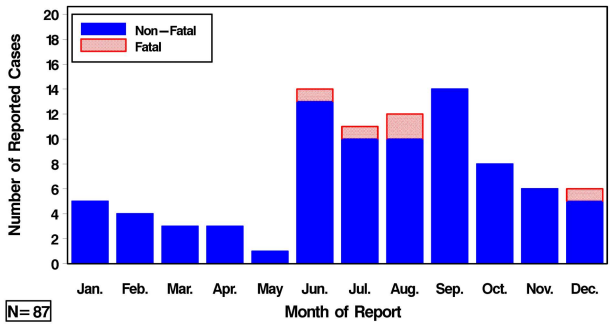
PHILADELPHIA
Department of Public Health

Central Nervous System Infections and Sepsis

Aseptic Meningitis
Classification as aseptic or viral meningitis is based upon the clinical diagnosis of meningitis with no laboratory evidence of bacterial or fungal infection. This classification excludes aseptic meningitis caused by West Nile Virus (WNV), which is discussed separately. In 2004, 87 cases of aseptic meningitis were confirmed among Philadelphia residents, which is lower than in recent years but high relative to the time preceding the emergence of WNV. All but 2 reports were on hospitalized patients, and 98% of these hospitalized patients were admitted for at least 24 hours, which demonstrates a bias towards the detection of cases with more severe clinical presentation. There was no predominant age distribution, and slightly less than half of cases were male (47%). Four cases died within 2 weeks of hospital admission. Medical records were reviewed on these cases and all were found to have significant co-morbid conditions at their time of death.

The viral agent was identified in only 8 cases – enterovirus (6), herpes simplex virus (1), and herpes zoster (1). Nearly 75% of the cases occurred between June and November (Figure 1), which suggests an enteroviral etiology for more cases than those with laboratory confirmation.

Figure 1. Aseptic Meningitis, Month of Report by Death Status: Philadelphia, 2004



Haemophilus influenzae
Haemophilus influenzae, a gram-negative coccobacillus, which has both encapsulated and unencapsulated forms, is transmitted through respiratory droplet exposure. All invasive *H. influenzae* infections are reportable in Philadelphia, and isolates are collected by the Division of Disease Control (DDC) accordingly. Surveillance and serotype analysis of all *H. influenzae* infections enhances the identification of vaccine-preventable *H. influenzae* type B infections and characterization of non-type B infections.

In 2004, 9 cases of invasive *H. influenzae* infection were reported. Seven cases were aged 40-64 years, and the remaining 2 were over 64 years of age. Only 2 cases presented with bacteremic pneumonia, whereas the other presentations were all primary bacteremia. Three fatalities occurred among these patients. Of the 7 isolates serotyped, there was 1 C (14%), 1 E (14%), and 5 non-typeable (72%).

The rate of invasive *H. influenzae* infections in Philadelphia is the same as the national rate based on provisional 2004 data (0.6 reports per 100,000 persons).

Listeriosis (*Listeria monocytogenes*)
Listeriosis, the infection of a normally sterile site by the gram-positive rod *Listeria monocytogenes*, is a rare but serious infection usually acquired from contaminated food products.

In Philadelphia, 11 confirmed cases of *Listeria monocytogenes* infection were reported in 2004. The clinical presentation in all patients was primary bacteremia, including one neonatal bacteremia. The only fatality was 1 of the 5 individuals aged 65 years or older. Of the non-neonatal patients, all but one report an underlying predisposing medical condition such as HIV/AIDS, cancer, immunosuppressive treatment, or kidney disease.

Eight bacterial isolates collected by DDC were molecularly typed by the Centers for Disease Control and Prevention (CDC). All were molecularly dissimilar from one another; however, 1 was indistinguishable from 5 isolates collected from patients residing in 5 different states but never linked to a single contaminated source.

With 0.7 reports per 100,000 persons, the rate of reported listeriosis cases in Philadelphia is higher than the US rate based on provisional 2004 reports (0.2 reports per 100,000 persons). This elevation is probably related to increased reporting following the large 2002 outbreak focused in the Philadelphia area.

DDC coordinates molecular typing of all *Listeria monocytogenes* isolates collected from Philadelphia residents.

Meningococcal Infection (*Neisseria meningitidis*)
Neisseria meningitidis, a gram-negative diplococcus, can be carried in the nasopharynx of healthy human hosts. It can be transmitted through contact with respiratory secretions of a carrier. Meningococcal infection in a person with clinically compatible illness is confirmed by isolation of *Neisseria meningitidis* from a normally sterile site or, in the absence of positive culture, is classified as a probable case when antigen is detected in the cerebrospinal fluid or when purpura fulminans is noted.

During 2004 in Philadelphia, there were 12 confirmed meningococcal infections and 2 probable infections reported. Clinical manifestations included 7 cases with primary bacteremia, 4 with meningitis, 2 with synovial infections, and a single pneumonia. The age distribution of the patients is shown in Figure 2. Of the 11 confirmed cases with isolates available for serogrouping, over half (55%) were serogroup Y (Table 1). There were no fatalities among any of the cases.

Figure 2. Meningococcal Infections, Age Distribution of Cases: Philadelphia, 2004

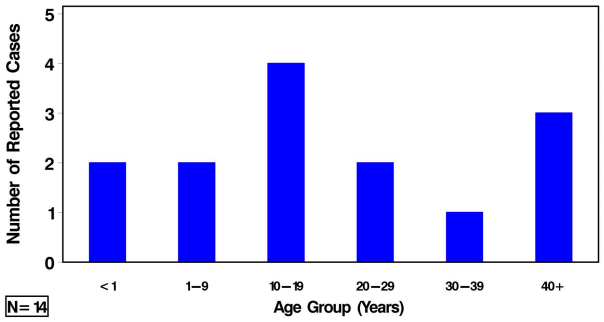


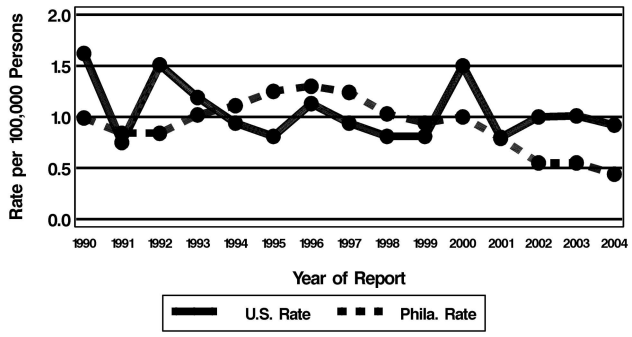
Table 1. Meningococcal Disease, Reported Serogroups Among Confirmed Cases: Philadelphia, 2000-2004

	2000	2001	2002	2003	2004	5-Year Total (%)
Serogroup						
B	3	1	5	3	1	**13 (18%)**
C	7	2	2	5	3	**19 (26%)**
W	0	0	0	1	0	**1 (1%)**
Y	9	5	7	4	6	**31 (43%)**
Z	0	0	0	0	1	**1 (1%)**
Not Grouped	2	1	1	2	1	**7 (10%)**

Six meningococcal infections occurred in students including one childcare attendee. In accord with CDC recommendations, contacts of cases were administered antibiotic prophylaxis if they were in a transmission risk group – household contacts, childcare contacts, and persons directly exposed to the patient's oral secretions.

The incidence of meningococcal disease in Philadelphia for 2004 was 1.0 per 100,000 persons, which is more than twice the national rate (Figure 3).

Figure 3. Meningococcal Infection Rates: U.S. and Philadelphia, 1990–2004



Meningococcal vaccine protects against serogroups A, C, Y, and W-135, but does not guard against serogroup B, which accounts for approximately one quarter of cases in the US. This year, with the introduction of Menactra®, a new more effective meningococcal conjugate vaccine, the Advisory Board on Immunization Practices updated the recommendation for meningococcal vaccine to include children ages 11 and 12, students entering high school, persons with select high-risk conditions, and college freshman living in dormitories. The "College and University Student Vaccination Act" (General Assembly of the Commonwealth of Pennsylvania Senate Bill No. 955 P.N. 2102) requires Pennsylvania college students residing in dormitories to receive one meningococcal immunization unless exempted (signed written waiver after receiving appropriate written information about the disease and effectiveness of vaccine). The Act does not stipulate that institutions of higher learning provide or pay for meningococcal vaccine.

Suspected meningococcal infections should be reported to DDC within 24 hours. DDC can assist with the identification and treatment of contacts who need prophylaxis and provide assistance with meningococcal serogrouping.

Invasive *Streptococcus pneumoniae*

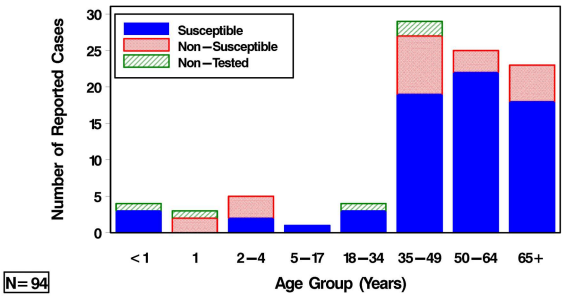
In the United States, pneumococcus is a leading cause of illness in young children, and causes significant illness and death among the elderly and persons with certain underlying medical conditions. The gram-positive encapsulated coccus colonizes the upper respiratory tract and is associated with a number of clinical illnesses including pneumonia, bacteremia, otitis media, meningitis, sinusitis, peritonitis and arthritis.

Reportable *Streptococcus pneumoniae* includes all clinical presentations of pneumococcal infection as long as the infection is of a normally sterile site. Invasive *Streptococcus pneumoniae* infections are classified by susceptibility to antimicrobial agents currently approved for the treatment of pneumococcal infection (penicillin, broad spectrum cephalosporins, and other drugs as clinically indicated) to allow for the monitoring of drug resistance in the local area.

During 2004, 94 cases of confirmed invasive pneumococcal infections were reported to DDC. The clinical infections included 65 cases with primary bacteremia, 8 with meningitis, 19 with pneumonia, 1 with peritonitis, and 1 with a urinary tract infection (collected from catheter). Nearly all cases (97%) were hospitalized. The 11 fatalities that occurred were among adults (>18 years of age).

Twenty-one (23%) of the 90 isolates tested were classified as Drug Resistant *Streptococcus pneumoniae* (DRSP) because they were not susceptible to penicillin (Table 2). The proportion of 2004 DRSP cases is an increase from 16 cases in 2003. The rate of DRSP infections in Philadelphia (1.4 reports per 100,000 persons) is nearly 2 times the national rate (0.7 reports per 100,000 persons – based on provisional data). A high proportion (24%) of these non-susceptible infections were among children under the age of 5 years (Figure 4).

Figure 4. Invasive *Streptococcus pneumoniae* Infections by Age and Penicillin Susceptibility: Philadelphia, 2004



DDC collected isolates for serotyping from 6 of the 12 cases less than 5 years of age. None of the serotypes identified [19A (4), 22F (1), 7F (1)] are covered by the pneumococcal polysaccharide conjugate vaccine (PCV7) currently licensed for use in children under 5 years of age; 19A, however, is one of the serotypes associated with DRSP.

Table 2. Antimicrobial Susceptibility of Invasive *Streptococcus pneumoniae* isolates reported to DDC during 2004 and the CDC Emerging Infections Program (EIP) Active Bacterial Core Network during 2003 (N=3,215).

	Philadelphia, 2004		EIP, 2003
	No. Tested	% Susceptible	% Susceptible
Antibiotic			
Penicillins	90	77	80.0
Cephalosporins	35	97	*96.9
Erythromycin	20	90	82.6
TMP/SMX	21	90	76.7
Levofloxacin	31	100	99.6
Vancomycin	21	100	100.0

*Cefotaxime only

Note: Six additional specimens were tested against other antibiotics and all were susceptible.

Other Bacterial Meningitis

Bacterial meningitis is limited to clinical meningitis with a causative bacterial agent other than *Neisseria meningitidis*, *Haemophilus influenzae*, *Listeria monocytogenes*, and invasive *Streptococcus pneumoniae*, which are discussed above.

In 2004, 4 cases of bacterial meningitis were confirmed. The etiologic agents were identified as Group B *Streptoccocus* (2), *Serratia marcescens* (1), and an outbreak strain of *Salmonella* Berta identified in New Jersey during July 2004 (1). There were no fatalities among the cases, which included 3 males and 2 neonates (<2 months of age).

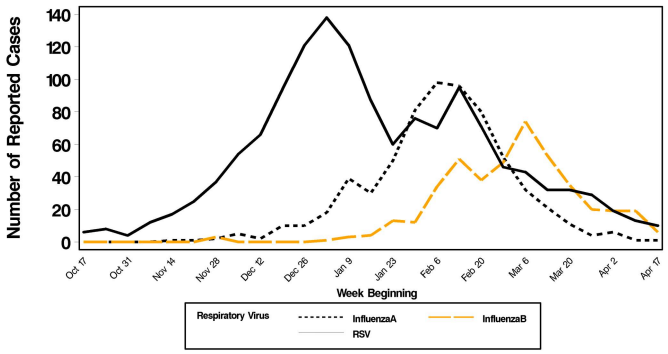
Respiratory Infections

Influenza and Respiratory Virus Surveillance (2004-2005 season)
Influenza (the flu) is a respiratory disease caused by the influenza virus. The virus is usually spread from person to person through droplets generated during coughing and sneezing. Clinical illness from influenza can range from mild to severe illness and may lead to death in some cases. Nationally, in a typical flu season more than 36,000 deaths and 200,000 hospitalizations occur in individuals secondary to complications from influenza, predominately in the very young and people 65 years of age and older. Influenza vaccine remains the most important measure to prevent disease in people. All children 6-23 months of age, and any individual with a chronic illness and all people 65 years of age and older are recommended to receive a flu shot.

In early October 2004, federal authorities learned Chiron Corporation would be unable to supply 48 million flu vaccine doses, due to British regulatory action. The FDA, which sent inspectors in early October, agreed Chiron's flu vaccine was not safe to use. With the exodus of Chiron from the US market a severe vaccine shortage occurred during the 2004-05 influenza season. Due to the vaccine shortage CDC restructured influenza vaccine guidelines and recommendations to ensure immunization coverage rates were maintained among high-risk and priority groups. Utilizing the new recommendations, the Philadelphia Department of Public Health, Division of Disease Control (DDC) provided over 37,000 doses of influenza vaccine to eligible Philadelphia residents at the District Health Community Care Centers and several other partner sites in the Philadelphia area.

DDC has conducted laboratory-based surveillance of viral respiratory agents since 1996. During influenza season, sentinel hospital-based laboratories report weekly aggregate data on the number of positive tests for respiratory syncytial virus (RSV), influenza, and other respiratory viruses (identified through viral culture or rapid identification assay). These reports are used to monitor the occurrence of seasonal respiratory viruses in Philadelphia and trends in their circulation. In the past, 3 laboratories participated in this surveillance system. In the fall of 2004, DDC surveyed all clinical laboratories serving Philadelphia healthcare facilities and incorporated 9 additional laboratories performing diagnostic tests for respiratory viruses into this surveillance system. Data from 11 laboratories are shown in Figure 5, which illustrates the number of laboratory-confirmed respiratory viral infections for the weeks beginning October 17, 2004 to April 17, 2005. During this time period the following viral respiratory agents were identified: 1,124 influenza viruses (650 influenza A, 428 influenza B, and 46 unspecified), 1,376 RSV, 215 Adenoviruses, 125 parainfluenza (105 parainfluenza 1, 4 parainfluenza 2, and 16 parainfluenza 3) and 26 rhinoviruses.

Figure 5. Respiratory Agents by Week: Reports from 11 Hospital Laboratories



The Philadelphia Board of Health requires the reporting of all pediatric mortality and institutional outbreaks attributed to influenza. During the 2004-2005 influenza season, 2 pediatric deaths were reported to PDPH. The deaths were in a 2 year old and a 10 year old; both were diagnosed with Influenza A and both had co-morbidities.

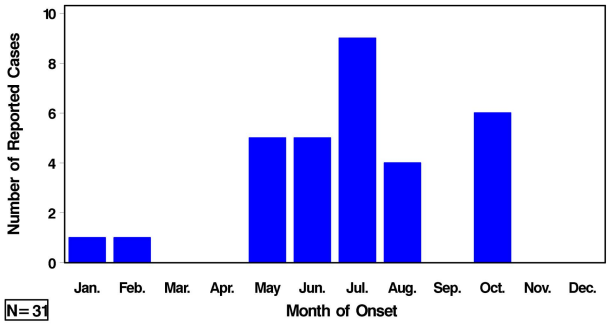
DDC assisted in influenza outbreak management in 6 long-term care facilities and 1 shelter. Outbreak management recommendations for residents and staff included vaccination and prophylaxis for those exposed to ill residents. Heightened surveillance for influenza like illness (ILI) in these facilities was also instituted and was used as a marker for the resolution of the outbreak.

Legionellosis (*Legionella pneumophila*)
Legionella pneumophila bacteria cause two distinct forms of disease: Legionnaire's Disease, a severe respiratory illness including pneumonia, and Pontiac Fever, a milder illness. The Centers for Disease Control and Prevention (CDC) defines a confirmed case as a clinically compatible disease where the presence of *Legionella* species is laboratory-confirmed; the large majority of human infections are caused by *L. pneumophila* serogroup 1. Acceptable tests for laboratory confirmation are 1) isolation of *L. pneumophila* from respiratory secretions, lung tissue, or normally sterile fluids; 2) demonstration of *L. pneumophila* serogroup 1 antigens in the urine; 3) detection of *L. pneumophila* serogroup 1 antigens in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody testing; or 4) detection of greater than or equal to a 4-fold rise in antibody titers between paired acute- and convalescent-phase serum specimens.

There were 31 confirmed cases of legionellosis in Philadelphia in 2004, with a citywide incidence of 2.1 per 100,000 persons. All 31 cases presented with pneumonia, and all were confirmed by urine antigen. Nineteen

(61%) were also culture-positive. Fourteen (45%) were males, and the median age of cases was 59 years (range 30-81 years). There were 3 fatalities. Thirteen (42%) of the cases were smokers. Fifteen (48%) of the cases had a predisposing medical condition. Of these, nonexclusive risk factors included transplant (1), renal disease (1), cancer (3), diabetes (5), and immunosuppression (4). The incidence of disease increased during the months of May to October (see Figure 6). Pennsylvania has one of the highest rates of legionellosis in the country, with an annual incidence in 2004 of 2.1 per 100,000 population. In 2004, the US as a whole had an incidence of 0.65 per 100,000 population.

Figure 6. Legionellosis Cases by Month of Onset: Philadelphia, 2004



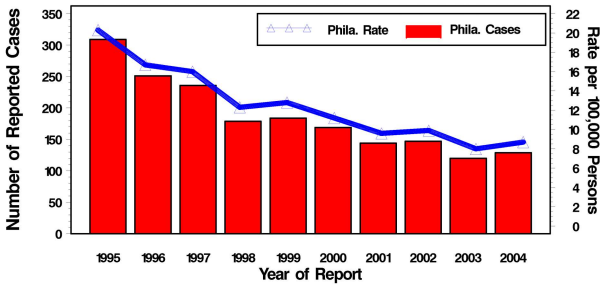
For suspected nosocomial outbreaks, DDC can provide assistance with investigation and analysis of clinical and environmental isolates of *Legionella* by pulse-field gel electrophoresis (PFGE).

SARS (Severe Acute Respiratory Syndrome)
In March of 2003, Severe Acute Respiratory Syndrome (SARS) emerged in the southern provinces of China and quickly spread to 30 countries, infecting greater than 8,000 people, and causing nearly 800 deaths. The syndrome is caused by a coronavirus (SARS-CoV) which is primarily spread through droplet transmission, though there is some evidence to suggest airborne transmission.

Philadelphia had no SARS cases in either 2003 or 2004 and the disease is not globally active at this time; however, the high rates of morbidity and mortality due to SARS-CoV call for careful surveillance for the recurrence of transmission and preparations for the rapid implementation of control measures. Testing for SARS-CoV can be performed on respiratory specimens, blood, and stool; however, testing should be performed in consultation with DDC. DDC will continue surveillance for SARS and will facilitate collection and transport of clinical specimens to the Pennsylvania Department of Health Bureau of Laboratories (BOL), where testing is performed.

Tuberculosis (*Mycobacterium tuberculosis*)
In 2004, the Philadelphia Tuberculosis Control Program reported 129 newly confirmed cases of tuberculosis (TB). This represents a 7.5% increase from the prior year when 120 new cases of tuberculosis were reported. Despite this increase, there has been a 68% decrease in the number of tuberculosis cases reported in Philadelphia in the past decade, from 309 cases in 1995 to 129 last year (Figure 7). In Philadelphia, the TB case rate for 2004 was approximately 8.7 per 100,000 population; this is above the Healthy People 2010 Objective of no more than 3.5 per 100,000 population. The Philadelphia cases represent 39% of the total number of cases in the Commonwealth of Pennsylvania for this period (327).

Figure 7. Tuberculosis, Cases and Rates, Philadelphia 1995—2004



Despite recent success, Philadelphia continues to have a substantial caseload in a complex, diverse environment. It's anticipated that TB cases in Philadelphia will decline at a slower rate over the next decade as immigrants and difficult to reach populations assume a larger proportion of the caseload. While the number of new cases declined during the last decade, TB among the foreign-born has remained stable. The percentage of foreign-born cases has more than doubled since 1996 as illustrated in Table 3. Foreign-born cases now account for nearly half of all reported cases in Philadelphia. Cases originated from 26 different countries in 2004. Asians account for 65 percent of the foreign-born cases, with Vietnam (17.7%), China (11.3%), Cambodia (6.5%) and India (6.5% each) indicated most often as country of origin.

Of the 129 diagnosed cases in 2004, 3 were homeless, 1 resided in a correctional facility, and 4 resided in long-term care facilities. Three had a history of injected drug use (3.1%), 8 had a history of non-injected drug use (6.2%), and 11 (8.5%) had a history of excess alcohol use within a year of diagnosis.

TB among children less than 15 years of age increased from 4 cases in 2003 to 7 cases in 2004. Since TB disease in children indicates recently acquired infection and transmission, these data are of sentinel importance.

Table 3: Number and Percent of Foreign-born (F-B) TB Cases, Philadelphia, 1996-2004

Year	Total Cases	# F-B	% F-B
1996	251	58	23%
1997	236	59	25%
1998	179	46	26%
1999	184	57	31%
2000	169	67	39%
2001	144	62	43%
2002	147	51	35%
2003	120	54	45%
2004	129	62	48%

Source contact investigations are initiated for all cases in children less than 15 years of age. TB cases among those 65 years of age and older in Philadelphia remained stable over the last year with the total number of cases dropping from 24 in 2003 to 23 in 2004. This population accounts for about 19% of the total number of cases.

Eighty-four cases (65.1%) were diagnosed with pulmonary TB alone, 32 (24.8%) with extra-pulmonary TB alone, and 13 (10.1%) had both pulmonary and extra-pulmonary TB.

Of the 129 cases reported during 2004, 88 (68.2%) had a positive culture for *M. tuberculosis*. Antimicrobial susceptibility testing was performed on all 88 *M. tuberculosis* isolates, and 87.5% were susceptible. Of the 11 isolates (12.5%) found to be resistant to at least one drug, 4 (36%) showed resistance to INH only, while 1 (9%) was resistant to streptomycin only. There were 6 isolates that showed resistance to multiple drugs. Two (18%) were resistant to INH and ethionamide, 1 (9%) was resistant to INH, ethionamide and rifampin; 1 (9%) was resistant to INH and ethambutol; 1 (9%) was resistant to INH, pyrazinamide and streptomycin; and 1 (9%) was resistant to ethionamide and streptomycin. Over 97% (126/129) of patients diagnosed with TB in 2004 had initial treatment consisting of either the standard 4-drug regimen (rifampin, INH, pyrazinamide, and ethambutol) or some other multiple drug combination.

The TB Control Program provides Directly Observed Therapy (DOT) to all suspected and confirmed TB cases, along with other clinical services, through the Flick Memorial Center for the Treatment of Tuberculosis. The TB Control Program also coordinates universal genotyping of all isolates of *M. tuberculosis* sent to the Philadelphia Public Health Laboratory.

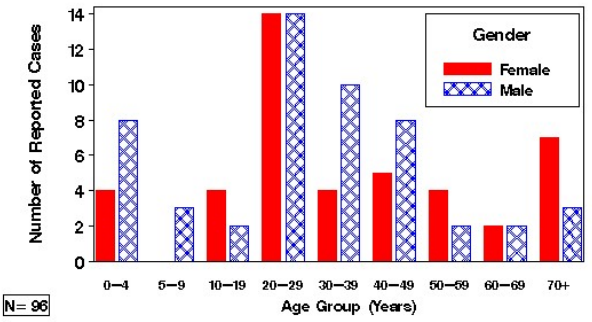
Providers are reminded to report suspected and confirmed TB cases within 24 hours to the TB Control Program at (215) 685-6744.

Gastrointestinal Infections

Campylobacteriosis (*Campylobacter spp.*)
Campylobacter is one of the most common bacterial causes of diarrheal illness in the United States although most cases are sporadic events and are rarely part of large outbreaks.

Ninety-six culture-confirmed cases of campylobacteriosis were reported among Philadelphia residents in 2004. Twenty-eight of the 96 cases had species data available; of these, 27 were identified as *C. jejuni* and 1 was identified as *C. fetus*. Slightly more than half of the cases were male (54%). Figure 8 displays cases by age group and sex. The highest incidence rate (12 cases per 100,000 population) occurred in 0-4 year olds and 20-29 year olds. Symptoms reported by the cases included diarrhea (95%), fever (59%) abdominal pain (56%), nausea (27%), and vomiting (21%). Nineteen cases required hospitalization; no fatalities were reported. During the incubation period for disease, 24% of cases reported having animal contact and 20% reported foreign travel.

Figure 8. *Campylobacter spp.* by Age Group and Gender: Philadelphia, 2004



The number of 2004 confirmed *Campylobacter* cases with antimicrobial susceptibility test results for one or more drug reported was 27 (28%). Two of 27 (7%) of confirmed *Campylobacter* cases with susceptibility testing for erythromycin and ciprofloxacin were resistant to both. Detailed susceptibility results can be found in Appendix A.

***Escherichia coli* O157:H7 (*E. coli* O157:H7)**
E. coli O157:H7 is a shiga-toxin producing bacteria that causes diarrhea (often bloody) and abdominal cramps. Approximately 8% of these infections lead to hemolytic uremic syndrome (HUS).

Eleven cases of *E. coli* O157:H7 infection were identified in 2004; 6 of these (55%) were laboratory confirmed. The other 5 cases (45%) had clinical symptoms consistent with *E. coli* O157:H7 infection, had a positive shiga-toxin test in the absence of laboratory confirmed *E. coli* O157, and were thus classified as probable cases.

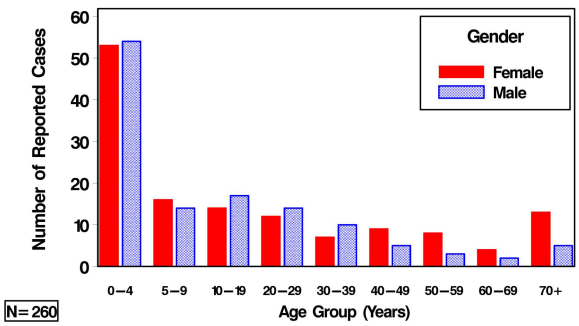
Fifty-five percent of cases were male. The median age of males was 14 years and the median age of females was 52 years. Symptoms reported by cases were as follows: diarrhea (100%), abdominal cramps (100%), bloody diarrhea (70%) and fever (55%). Although there were no deaths or serious complications of infection, 4 cases were hospitalized.

In February 2004, 2 *E. coli* O157:H7 laboratory-confirmed cases having onset days 13 days apart reported eating in the same restaurant shortly before onset of symptoms. Pulsed Field Gel Electrophoresis (PFGE) was performed on the 2 strains and it was determined that the strains were identical. An investigation of the restaurant was conducted and although several violations were noted, food samples taken were negative for *E. coli*.

Salmonellosis (*Salmonella*)
Salmonella is a group of bacteria that causes diarrhea in humans, and it is passed from the feces of animals or humans to other animals and humans.

Two hundred and sixty-one cases of salmonellosis were reported in 2004, excluding typhoid fever, which is discussed separately below. Of these, 252 were laboratory-confirmed and 9 were classified as probable because they were not laboratory-confirmed but were linked to a confirmed case and had clinical symptoms that were compatible with salmonellosis. Cases ranged in age from <1 to 93 years. The burden of disease was highest among children less than 4 years of age (Figure 9); this age group comprised 41.2% of total *Salmonella* cases in 2004. The incidence rate in Philadelphia is 17.2 cases per 100,000 population, slightly above the national incidence rate of 14.3 cases per 100,000.

Figure 9. *Salmonella* by Age Group and Gender: Philadelphia, 2004



Symptoms among Philadelphia cases included: diarrhea (95.4%), fever (66.3%), abdominal pain (45.2%), vomiting (29.8%), and nausea (20.2%). Forty-one hospitalizations and 2 deaths occurred among the 261 cases.

Eighty-seven cases (33.3%) reported animal contact during the relevant exposure period. Eighteen cases (6.9%) reported having a reptile as a pet although only 3 of these cases were infected with serotypes that are usually reptile-associated. Serotype information was available for 237 cases. The majority were *S.* Enteritidis (108 isolates, 45.6%) or *S.* Typhimurium (52 isolates, 21.9%).

The number of 2004 confirmed *Salmonella* cases with antimicrobial susceptibility test results for one or more drugs was 192 (76%). Four (3%) of 161 isolates with susceptibility testing for ampicillin, ciprofloxacin, and trimethoprim-sulfamethoxazole (TMP/SMZ) were resistant to more than one drug. Detailed susceptibility results can be found in Appendix A.

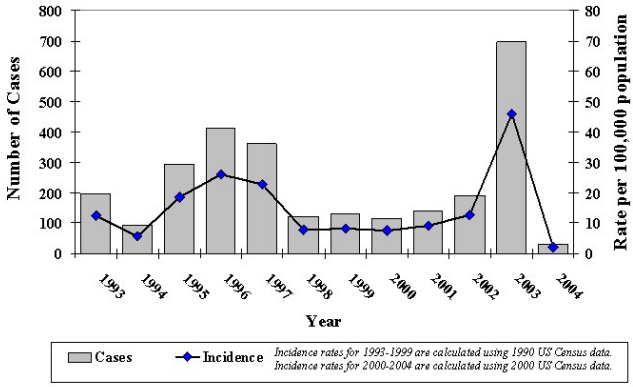
Typhoid Fever (*Salmonella* Typhi)
Typhoid fever is a life-threatening illness caused by *Salmonella* Typhi. In this report, *Salmonella* Typhi is separated from other *Salmonella* serotypes because of the severity of illness and because most cases are imported from other countries. There are about 500 cases annually in the United States; the incidence is much higher in the developing world.

Two cases of typhoid fever were reported to the Division of Disease Control (DDC) in 2004. A 30 year-old male, who traveled to Thailand, Malaysia, Indonesia, Japan and Australia, returned to the United States 3 days before onset of symptoms. This patient was hospitalized and was prevented from working for 5 weeks because of the nature of his profession. The second case of typhoid fever was an 18 year-old female who traveled to India and returned to the United States on the same day of symptom onset. She was not hospitalized. Both patients recovered. Neither patient had received typhoid vaccine prior to traveling.

Shigellosis (*Shigella spp.*)
Shigella causes an infection characterized by diarrhea (often bloody), fever, and stomach cramps and can be divided into 4 serogroups: *S. dysenteriae*, *S. flexneri*, *S. boydii*, *and S. sonnei*. *S. dysenteriae* and *S. boydii* are rare in the United States but are an important cause of disease in the developing world.

Thirty-one reports of *Shigella* were received in 2004. Thirty cases were laboratory-confirmed and 1 additional case was determined to be probable because the case was linked to a confirmed case and had clinical symptoms consistent with shigellosis. The incidence in 2004 was 2.0 cases per 100,000, the lowest incidence of reported *Shigella* infection in the past 10 years (Figure 10). This was also much lower than the national incidence of 4.5 cases per 100,000. Serogroup data were available for all of the confirmed cases; 18 (60%) were identified as *S. sonnei*, 11 (37%) were identified as *S. flexneri* and 1 (3%) was identified as *S. dysenteriae*. The median age of cases was 33 years. Symptoms reported by cases were as follows: diarrhea (97%), fever (67%), abdominal cramps (63%), and vomiting (27%). Nine cases were hospitalized; no fatalities were reported. The case of *S. dysenteriae* had traveled to the Dominican Republic prior to disease onset.

Figure 10. Probable and Confirmed Shigellosis, Reported Cases and Incidence, Philadelphia 1993-2004



The number of 2004 confirmed *Shigella* cases with antimicrobial susceptibility test results for one or more drug reported was 18 (60%). Four (40%) with susceptibility testing to ampicillin, ciprofloxacin, and TMP/SMZ were resistant to both ampicillin and bactrim. Detailed susceptibility results can be found in Appendix A.

Cryptosporidiosis (*Cryptosporidium parvum*)
Cryptosporidiosis is a diarrheal disease caused by the parasite, *Cryptosporidium parvum*. Cryptosporidiosis is transmitted through ingestion of contaminated water, animal contact, or person-to-person contact via the fecal-oral route.

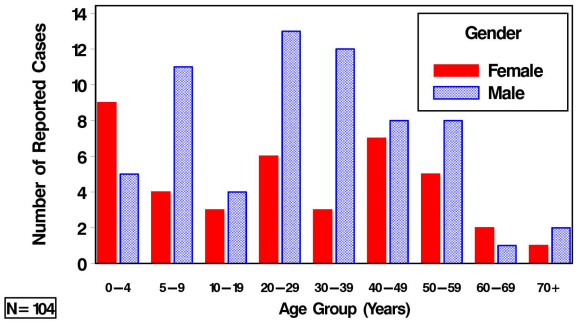
Nineteen confirmed cases of cryptosporidiosis were reported in 2004. The majority of cases were male (84%), and the median age was 33 years. Five out of 13 cases reported traveled outside of Philadelphia, although only 2 of these cases traveled outside of the United States. Four cases (29%) were immunocompromised. There were no deaths among these cases although 6 (43% of those with data available) required hospitalization.

In March of 2004, a manufacturer of *Cryptosporidium* antigen tests voluntarily recalled two lots of testing kits after the lots were found to provide a high rate of false positive results. Many of the suspected cryptosporidiosis cases reported to PDPH in early 2004 were later found to have false positive results attributable to these testing kits; none of these false positive cases are included in the analysis above.

Giardiasis (*Giardia lamblia*)
Giardiasis is a diarrheal disease caused by the protozoan *Giardia lamblia*. The protozoan lives in the intestine, is passed through the stool, and can live outside the body for long periods of time in multiple environments including soil, food, water, and surfaces that have been contaminated from infected humans or animals.

One hundred and four cases of laboratory-confirmed giardiasis were reported in Philadelphia residents in 2004. Males made up 61.5% of all cases in 2004 and more cases were seen in the 20-29 age group (Figure 11). Symptoms reported by the cases included diarrhea (72.9%), abdominal pain (43.5%), nausea (43.5%), vomiting (24.7%) and fever (15.3%). Although 11 cases were known to require hospitalization, there were no fatalities. Travel to a foreign country in the month before illness onset was reported by 31 cases (36.9%) and swimming was reported by 13 cases (15.3%).

Figure 11. *Giardia lamblia* by Age Group and Gender: Philadelphia, 2004



Outbreaks of Gastroenteritis
Each year the Philadelphia Department of Public Health (PDPH) conducts investigations related to acute onset, self-limited gastroenteritis. Many of these disease clusters are caused by viral agents, most often norovirus (formerly known as Norwalk-like virus). Illness presentation is within days of exposure, causing vomiting and diarrhea and resolution of symptoms within 48 hours. When an outbreak is identified, PDPH investigates risk factors associated with illness, and implements control measures to reduce transmission. In addition, PDPH can facilitate collection and laboratory testing of clinical specimens by supplying the appropriate collection media and transportation to the Pennsylvania Department of Health Bureau of Laboratories (BOL). To speak with a medical specialist regarding a disease outbreak, please call DDC at (215) 685-6748.

There were three large-scale event-associated outbreaks of gastroenteritis that were investigated by PDPH staff in 2004. The following is a brief summary of the salient events and findings in chronological order. In February 2004, 94 cases of self-limited vomiting and diarrhea were identified among conference participants at a hotel in Center City Philadelphia. Approximately two-thirds of the ill sought medical care at a nearby emergency department; no one required admission and there were no fatalities. Clinical specimens tested positive for norovirus, and there were 9 secondary cases detected among close contacts of conference attendees. Results of a case-control study implicated mayonnaise as the most likely associated food ingredient.

PDPH investigated a second outbreak of gastroenteritis among attendees of a wedding in June of 2004. Forty-nine cases of acute vomiting and diarrhea were identified with no hospitalizations or serious complications. A causative pathogen was not isolated from testing of clinical specimens, but the outbreak was believed to have been caused by a viral agent due to the clinical presentation and incubation period. Retrospective cohort analysis failed to confidently implicate a single risk factor or mechanism of transmission.

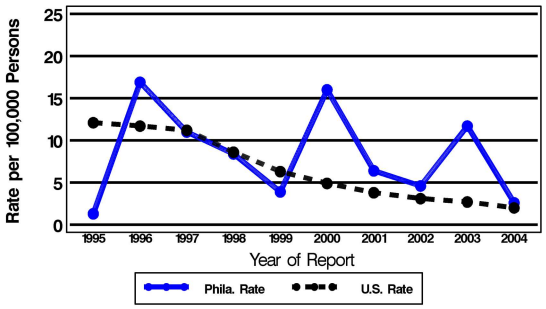
In November of 2004, an outbreak of acute-onset gastroenteritis at a city high school was investigated by PDPH. Eighty-two cases were identified among students and faculty in a 3-day period. Vomit was the most common symptom. Eleven percent of those ill sought medical treatment for their symptoms; none required hospital admission, and there were no fatalities. A cursory epidemiologic investigation did not reveal the mode of transmission and 1 clinical specimen tested negative for norovirus at BOL. The incubation period and clinical presentation of those who were ill suggest a viral etiology despite the one negative sample.

Hepatitis Infections

Hepatitis A

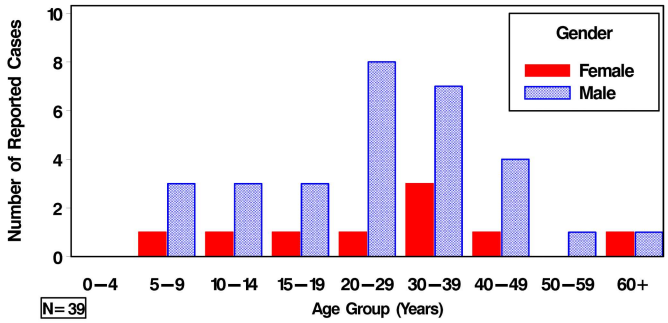
Hepatitis A is an acute viral illness of the liver that is transmitted via the fecal-oral route. The Centers for Disease Control and Prevention (CDC) case definition for a confirmed case of hepatitis A requires the presence of: a) discrete onset of symptoms, b) jaundice or elevated serum aminotransferase level, and c) IgM to hepatitis A virus. In 2004, the Division of Disease Control (DDC) received 120 reports of suspect hepatitis A cases. Of these, 39 were confirmed based on the CDC case definition. This reflects a 78% decrease in confirmed cases compared to 2003 (179) and brings the overall 2004 rate (2.6 per 100,000 population) closer to the 2004 US provisional rate (1.99 per 100,000 population) (Figure 12).

Figure 12. Hepatitis A Rates: Philadelphia and U.S., 1995–2004



Cases ranged in age from 6 to 84 years, with a median age of 28 years (Figure 13), and were primarily white (44%), and heterosexual (59%). Jaundice was reported in 87% of cases, and nausea and vomiting were reported in 56% of cases. Nineteen cases (49%) were hospitalized, but no deaths from hepatitis A were reported. Reported street drug use was identified as a risk factor in 21% of cases as compared to 29% in 2003. Eighteen cases (46%) reported having contact with a known case of hepatitis A, and 5 household clusters were identified.

Figure 13. Hepatitis A by Age Group and Gender: Philadelphia, 2004

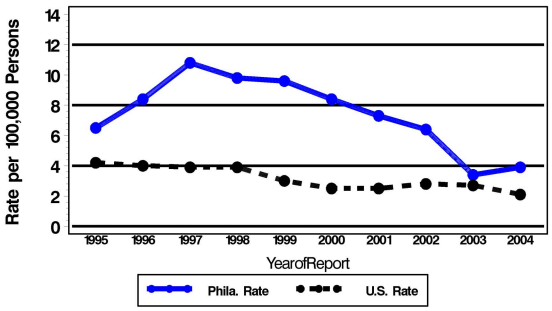


The overall decrease in the number of confirmed cases can be attributed to the cyclical nature of hepatitis A virus and to DDC's continued outreach in high-risk communities, through the efforts of the immunization programs. In cooperation with many community based medical providers for Asian Pacific Islanders, MSM, IVDU, sex workers, drug rehabilitation centers, and methadone clinics, the immunization program offers ongoing immunization interventions which were initiated in 2001 and continue to expand to serve high risk communities in Philadelphia.

Hepatitis B - Acute

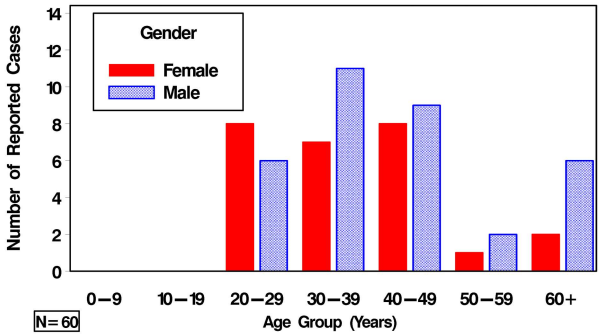
Hepatitis B is a serious infection of the liver that can lead to life long disease. Transmission occurs when an uninfected person comes into contact with the blood or other body fluid of an infected person. The CDC case definition for acute hepatitis B requires the presence of: a) discrete onset of symptoms, b) jaundice or elevated serum aminotransferase (ALT) levels, and c) IgM antibody to hepatitis B core or positive hepatitis B surface antigen. In 2004, DDC received 1,213 hepatitis B serology reports, of which 60 were confirmed as acute hepatitis B cases based on the CDC case definition. This reflects an 18% increase over the number of confirmed cases reported in 2003 (51). The overall acute hepatitis B rate for Philadelphia is 4 per 100,000 population as compared to the 2004 US provisional rate of 2.4 per 100,000 population (Figure 14). This increase in the Philadelphia rate shows a reversal in the downward trend seen in the past 5 years.

Figure 14. Acute Hepatitis B Rates: Philadelphia and U.S. 1995–2004



Confirmed cases ranged in age from 23 to 81 years (Figure 15), with 82% between the ages of 23 and 49. Cases were primarily male (57%). Of the confirmed cases, 87% reported only heterosexual contact and 25% reported having more than 2 sexual partners. During the 6 months prior to illness, 10% of cases reported using injected street drugs, 6% reported a dental visit, and 3% received tattoo art. Eighteen cases (30%) were hospitalized, but there were no hepatitis B-associated fatalities.

Figure 15. Acute Hepatitis B by Age Group and Gender: Philadelphia, 2004



Perinatal Hepatitis B

The Philadelphia Board of Health requires all pregnant women to be screened for hepatitis B surface antigen (HbsAg) and that all positive test results are reported to DDC. Those who test positive are followed to assure that infants receive hepatitis B immune globulin (HBIG) after delivery, and that the hepatitis B vaccine series is initiated. Infants are also followed until they complete hepatitis B immunization and post vaccination testing for hepatitis B infection. This follow-up process can take up to 2 years.

In 2004, 122 infants born to hepatitis B positive mothers were reported to DDC. All 122 infants received a dose of hepatitis B vaccine at birth, and 119 infants were given the first dose of HBIG at birth. Seventy infants (57% of those reported in 2004) are due for immunizations or serology in 2005. Among the 36 infants who have completed follow-up serologic testing (30%), 34 were found to be immune and 2 are carriers. All 36 of these infants completed testing by 1 year of age.

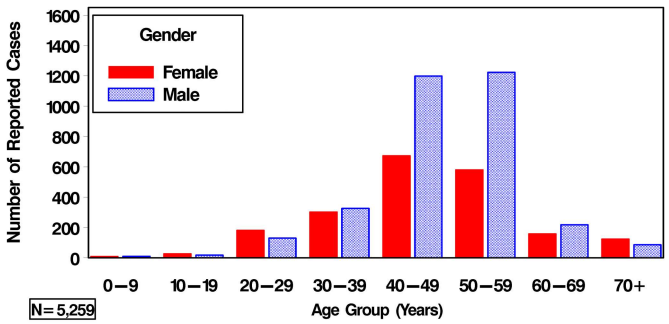
Hepatitis C

Hepatitis C virus (HCV) is the most common chronic bloodborne viral infection in the United States. CDC estimates that 4 million Americans have been infected with HCV and 2.7 million Americans with HCV are chronically infected. HCV is the leading indicator for liver cancer and approximately 70% of those chronically infected have chronic liver disease. As a nationally notifiable infectious disease, clinical laboratories are required to report patients with serologic evidence of acute or chronic hepatitis C infection. CDC currently designates the chronic infection status as hepatitis C infection, past or present. The case definitions for acute hepatitis C and hepatitis C infection, past or present, can be found at http://www.cdc.gov/epo/dphsi/casedef/hepatitiscurrent.htm and http://www.cdc.gov/epo/dphsi/casedef/hepatitisccurrent.htm, respectively.

DDC maintains a registry of persons with positive HCV laboratory results in order to facilitate counseling, education, and follow-up of infected persons. The HCV registry consists of Philadelphia residents who have evidence of HCV infection since January, 1998, including any positive test by EIA, RIBA, and/or nucleic acid amplification. These reports may not include confirmatory test results, nor are liver enzyme results routinely collected; therefore, DDC is unable to assure that all reported morbidity indicates true HCV infection. Nevertheless, in a region of high HCV disease prevalence, such as Philadelphia, the positive predictive value of a single positive HCV laboratory test is high.

In 2004, DDC added 5,259 unique new patients into the HCV registry. This is a 29% increase from 2003 in the number of new patients with any positive hepatitis C test. The registry increase may reflect an increase in reporting among providers, an increase in the frequency of diagnostic testing, and/or a true increase in disease incidence. Figure 16 shows the newly reported hepatitis C cases by age and gender. Of the 5,259 newly reported 2004 cases, 2,959 are probable cases that have positive antibody tests but lack further reported testing that would confirm the CDC case definition. The other 2,300 newly reported cases met the CDC case definition for confirmed status. The HCV registry also contains 318 cases that were reported in 2003 but became newly confirmed through additional testing in 2004, yielding a total of 2,618 cases who became confirmed based on a 2004 laboratory test.

Figure 16. Newly Reported Hepatitis C by Age Group and Gender: Philadelphia, 2004

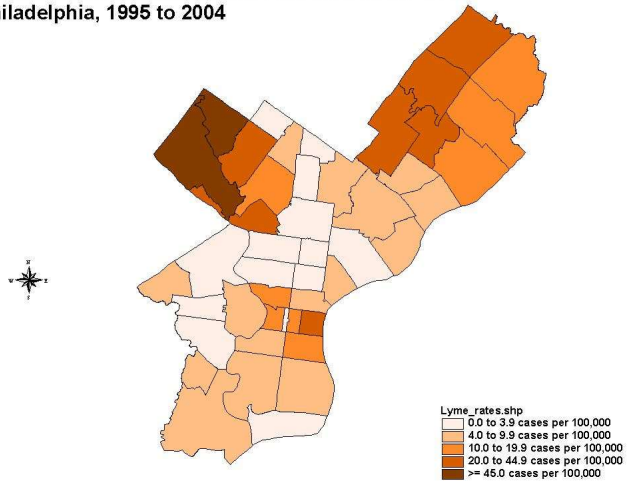


Vector-borne Diseases

Lyme Disease *(Borrelia burgdorferi)*

Lyme disease is a bacterial infection transmitted by the deer tick. For surveillance purposes, CDC-defined confirmation of Lyme disease requires that a case have either (a) physician-diagnosed erythema migrans > 5cm or (b) at least one of the late manifestations of disease with positive laboratory criteria for disease. In 2004, clinical laboratories reported positive Lyme serologic test results (enzyme immunoassay, Western blot, immunoblot, etc.) for 762 unique people. Of these, 182 were confirmed new cases based on the case definition. This reflects an 12% increase in cases when compared to 2003 (164). The other reported cases were not confirmed either because no clinical information was obtained from health providers, clinical case definition was not fulfilled, or the case lived outside of Philadelphia.

Average Annual Rates of Lyme Disease by ZIP code: Philadelphia, 1995 to 2004



Cases ranged in age from 3 to 103 years (median 37 years) (Figure 17); 59.1% were male and 42.9% were female. Presenting clinical manifestations for Lyme disease among confirmed cases were: arthritis (55.7%); erythema migrans (43.1%); Bell's palsy (9.3%); radiculopathy (5.5%) lymphocytic meningitis/encephalitis (3.3%); and carditis (1 case). A review of test dates, showed that 78% of Lyme disease testing was done in the months of June to November (Figure 18), which reflects the seasonality of this infection. Over the last 10 years, the highest incidence of newly diagnosed cases has occurred in northwest Philadelphia (see Map).

Figure 17. Lyme Cases by Age and Gender: Philadelphia, 2004

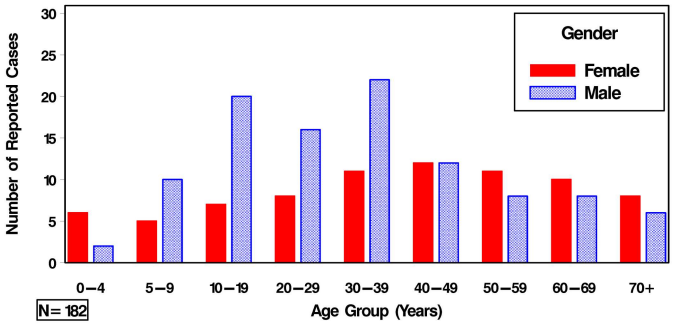
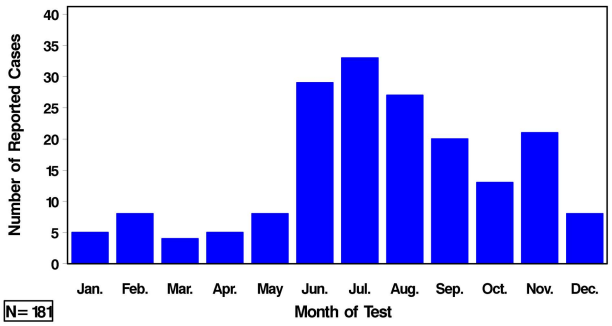


Figure 18. Lyme Cases by Month of Test: Philadelphia, 2004



Malaria (*Plasmodium spp.*)

A confirmed case of malaria is defined as an episode of microscopically confirmed parasitemia in any person, symptomatic or asymptomatic, diagnosed in the United States regardless of whether the person experienced previous episodes of malaria while outside the country. In 2004, 13 Philadelphia residents were diagnosed with confirmed malaria based on microscopic examination of a peripheral blood smear. The etiology by species was *P. faliciparum* (9), *P. vivax* (2), other (1), unknown (1). The median age for cases was 31 years (range, 7 to 52 years). Eight cases (62%) were male.

Twelve of the 13 cases were located and interviewed. Of these, 11 cases appear to have acquired their infection in West Africa and the other in India. Only 1 case reported taking anti-malarial prophylaxis. Eleven cases were documented to have received treatment.

West Nile Virus

In 2004, the Division of Disease Control (DDC) had 1 reported human West Nile virus (WNV) encephalitis case confirmed by serum testing. This 69 year old male developed fever and altered mental status in September. In addition, 1 positive WNV viremic (but asymptomatic) blood donor was reported to DDC. This donor's blood was identified by nucleic acid testing and removed from distribution with the assistance of the American Red Cross. Fifty-seven clinical specimens (37 CSF only, 20 serum only) were submitted from Philadelphia to the Pennsylvania Department of Health Bureau of Laboratories (BOL) for WNV testing. In 2003, by contrast, Philadelphia reported 24 human positive cases of WNV and 1 death; that year, 107 clinical specimens of Philadelphia residents were tested.

In 2004, a similar decrease in disease was observed statewide and throughout the Northeastern United States. In 2004, Pennsylvania reported 15 human cases of WNV involving 12 counties across the state. This represents a 94% decrease from the number of reported human cases in 2003 (n=237). The exact cause of this decrease in disease throughout the Northeastern United States is unknown. However, several factors are hypothesized as responsible, including (a) aggressive mosquito control efforts and improved knowledge about mosquito control gained during the 5 prior seasons, (2) cooler average summer temperatures, (3) improved public and provider understanding of preventive methods, and (4) possible development of immunity in both amplifying hosts and humans.

On the national level, WNV activity was documented across 47 states and the District of Columbia, encompassing 2,539 human cases (a 66.1% decrease from 7,499 cases reported in 2003) and 100 deaths. Of these, 1,142 reported neuroinvasive disease (WNV encephalitis or meningitis), 1,269 reported West Nile fever (milder disease), and 128 were clinically unspecified.

The PDPH Division of Environmental Health Services (EHS) in conjunction with the Pennsylvania State Department of Environmental Protection (DEP) maintains an aggressive mosquito control program to decrease mosquito vector transmission from viremic birds that lead to human infection. Similar to the decrease in human transmission of disease, EHS witnessed a corresponding decrease in WNV activity among avian and mosquito surveillance. In the 2004 season, the first report of WNV disease in Philadelphia was a sentinel bird that tested positive for WNV on July 27.

As of January 2005, the national surveillance case definition changed to encompass non-neuroinvasive clinical syndromes (especially the "arboviral fevers") caused by WNV, St. Louis encephalitis, eastern equine encephalomyelitis, western equine encephalomyelitis, Powassan, or California serogroup viruses. The list of reportable diseases and conditions will recognize WNV as a separate entity from the reporting of arboviral infections in general. DDC continues to be available to coordinate and assist providers in ordering the appropriate tests to evaluate persons suspected of having WNV Infection.

Vaccine-preventable Diseases

Measles (Rubeola)
Six suspected measles cases were reported to the Division of Disease Control (DDC) in 2004; 3 were ruled out based on a negative serologic test (IgM), and the other 3 were ruled out because the clinical case presentation was incompatible with measles. Four additional persons were reported as a result of positive measles serologic tests that were conducted solely for screening of immunity. Preliminary results suggest that nationally there were a total of 37 confirmed cases of measles in 2004; of these, 27 were acquired outside the US and 5 were linked to those imported cases.

Mumps
Fifteen suspected mumps cases were reported to DDC in 2004, of which, none were confirmed according to the Centers for Disease Control and Prevention (CDC) case definitions. One of the reported cases, a 13 year old male, was designated as a probable case. No laboratory tests were performed, but the case did have clinical symptoms consistent with the case definition.

It is important that clinicians realize that the clinical presentation of mumps can be mimicked by infection with other viruses, such as Epstein-Barr virus, enteroviruses, parainfluenza and adenoviruses. Hence, laboratory testing is preferred for confirming the diagnosis and identifying possible lapses in vaccine efficacy. The other viruses that mimic mumps clinically have specific seasonal patterns that can help distinguish them from mumps. Coxsackie virus (the most common enterovirus) infects children under 5 years old and typically predominates in the later half of the year. Parainfluenza virus infections are also common in children under 5 years old but predominate in the winter and spring seasons. Adenoviruses may affect all age groups and have no seasonality. A diagnosis of mumps can only be confirmed by viral culture of urine or nasopharyngeal aspirate, or by positive serologic tests (IgM). Parainfluenza and adenoviruses are best detected with rapid viral screen on naso-pharyngeal aspirates. Enteroviruses are best detected by PCR of CSF, blood, urine or stool. Epstein-Barr virus is best detected by heterophile serology or an EBV-specific antibody test.

Rubella (German Measles)
A rubella epidemic in the United States in 1964 resulted in 12.5 million cases of rubella infection, 2,000 cases of encephalitis, 11,250 abortions (surgical/spontaneous) and 2,100 neonatal deaths. During the epidemic, about 20,000 infants were born with congenital rubella syndrome (a pattern of fetal abnormalities that includes cataracts, hearing impairment, cardiac disease and mental retardation). Since that era, rubella has been virtually eliminated in the US by rubella immunization. In 2004, there were 9 provisional acute rubella cases reported in the US, of which 3 were imported and 4 were foreign-born individuals, and 1 was an infant born with congenital rubella syndrome whose mother was a refugee to the US. No cases occurred in Philadelphia.

Pertussis (*Bordetella pertussis*)
Pertussis (whooping cough) is a highly communicable disease of the respiratory system that is preventable through multiple series vaccination. The disease is caused by infection of the upper airway with the gram-negative coccobacillus *Bordetella pertussis*. The diagnosis is often based on clinical signs alone because of the difficulties of laboratory testing. Symptoms usually occur after a 7-21 day incubation period and consist of 3 clinically recognizable phases: catarrhal, paroxysmal, and convalescent. The paroxysmal coughing with delayed inspiration is usually the phase that triggers clinical recognition, except in neonates. Severe cases may have hypoxia, apnea, and post-tussive vomiting due to persistent coughing. Complications may include seizure, otitis media, and pressure effects from coughing such as rib fracture, pneumothorax, and subdural hematoma. Secondary bacterial pneumonia is the most common cause of death in pertussis cases. Clinical disease and complications are more severe among infants and neonates who are at greatest risk of infection due to incomplete vaccination.

Bordetella pertussis is endemic in the US. While vaccination has markedly reduced the incidence of cases since the 1940s, disease continues to occur, with approximately 18,957 US cases reported in 2004. It has been shown that immunity wanes 6 to 10 years after complete childhood vaccination, making adolescents and adults susceptible to infection and transmission. In recent years, older patients are accounting for higher percentages of pertussis cases. Given this, neonates and infants who are too young to have received full vaccination are at risk of infection from contact with adults. Hence, surveillance of this disease is extremely important to effect new approaches to control. Currently CDC has estimated that reported cases represent only a portion of the true burden of disease.

Available laboratory tests for pertussis include: culture, PCR, DFA, serology, and in infants, a CBC with predominant lymphocytosis. The CDC case definition, however, recognizes only cases confirmed by culture or PCR or cases epidemiologically linked to a laboratory confirmed cases. In addition to laboratory confirmation via PCR or culture, DDC classifies cases with a positive DFA and/or positive serology results as confirmed, as long as the case meets the clinical case definition. Cases are classified as probable if they have met the CDC clinical case definition, but no laboratory testing or epidemiologic link could be established, or if they were

epidemiologically linked or lab-confirmed but did not fully meet the CDC clinical case definition. Since both PCR and culture are difficult to perform and have low sensitivity if performed after the catarrhal phase, serology is being examined as an acceptable laboratory test, especially for adolescents and adults, where under-recognition, under-diagnosis and misdiagnosis are widespread. Serology would be an easier and more acceptable test to perform in adolescents and adults.

In Philadelphia in 2004, 109 reported pertussis cases met the DDC definition for confirmed or probable cases. Of these, 81 were considered confirmed because the cases had positive laboratory tests (PCR = 22, culture = 15, PCR/culture combined = 1, DFA = 7, serology = 18) or because the cases were epidemiologically linked to a laboratory-confirmed case (n = 18). The other 28 cases were considered probable. The 2004 annual pertussis incidence for Philadelphia was 7.3 per 100,000 population and for the United States was 6.5 per 100,000 population.

Age distribution of confirmed pertussis cases is shown in Figure 19. Forty-three (39%) of the cases were male and 66 were (61%) female. Many of the cases under 6 years of age had received the recommended number of pertussis-containing vaccines prior to infection (Table 4). None of the adult cases were able to document their vaccination history.

Figure 19. Pertussis by Age Group and Gender: Philadelphia, 2004

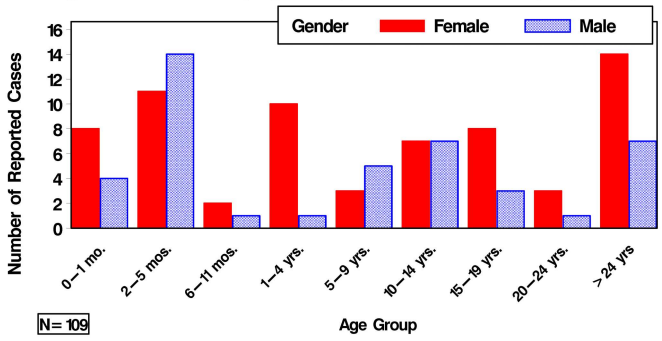


Table 4: Number of Pertussis-containing Vaccinations (PCV) Received Prior to Disease Onset: Philadelphia, 2004

	Number of PCV Doses				
	0	1	2	3	4+
Age Group					
0 to 1 month	12	0	0	0	0
2 to 3 months*	12	5	0	0	0
4 to 5 months	2	4	1	0	0
6 to 17 months	0	0	2	4	0
18 months to 5 years*	0	0	0	0	7

*Numbers exclude 2 cases with missing information.

Thirty-two (29%) of the cases required hospitalization, ranging in length from 1 to 35 days (median = 4 days). There were 2 deaths, both of which involved unvaccinated infants. Symptoms consisted of cough in 100% (109) of cases, with duration of cough ranging from 5 to 65 days (median = 30 days). Other reported symptoms included whoop (42%), apnea (41%), post-tussive vomiting (45%), and paroxysms (57%). Of the 99 cases (91%) who received antibiotics, 25% received erythromycin, 51% received azithromycin, 1% received clarithromycin and 4% were treated with other anitibiotics effective against pertussis. Two cases (2%) were treated with antibiotics not effective against pertussis. In the remaining 17 cases treated with anitbiotics, information on the specific antibiotic used was not reported.

In 2004, an outbreak of pertussis occurred in a Philadelphia hospital's neonatal intensive care unit. Three premature neonates developed progressive respiratory distress in the same week, all of whom had a positive clinical test for *Bordetella pertussis*. One of these infants died. Forty-seven neonates and 133 health care workers were given antibiotic prophylaxis. Eleven neonates were treated with erythromycin, and 18 neonates received trimethoprim-sulfamethoxazole. Pertussis is transmissible from health care workers to susceptible infants, and recommended expansion of the current pertussis immunization strategy to require full immunity among medical staff in contact with infants may be feasible with the recently licensed DTaP vaccines for adolescents and adults including health care workers.

Another outbreak involved residents of a shelter for recovering families and transitional families. DDC staff examined 24 people and tested them for pertussis. Of these, 19 were classified as confirmed pertussis cases. Seventeen other shelter residents were treated with prophylactic antibiotics.

In addition to the 2 outbreak incidents, there were 14 households with multiple cases, involving a total of 29 cases of pertussis in 2004.

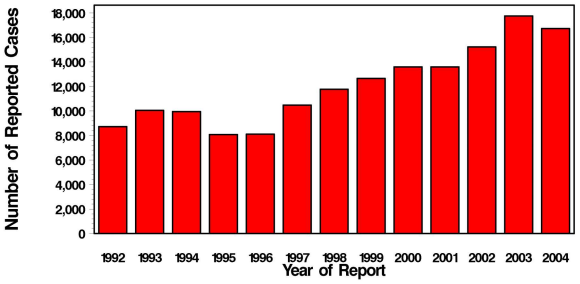
In suspected outbreaks, DDC can help facilitate diagnostic testing and assist with infection control and disease management. To speak with a medical specialist about a suspected outbreak, please call (215) 685-6748.

Chlamydia trachomatis

Chlamydia is among the most frequently reported infectious diseases in the United States. Although more than 877,000 cases were reported in the US in 2003, an estimated 3 million cases occur annually. In Philadelphia, 17,747 cases of *Chlamydia trachomatis* were reported in 2003, representing an increase of 16.5% (+2,513 cases) when compared to 2002. Through 2003, annual reported chlamydia morbidity more than doubled since 8,079 cases were reported in 1995. This increase (+9,668 cases) was primarily attributable to increased screening activities and improved sensitivity of laboratory methodologies (e.g., nucleic acid amplification tests).

In 2004, reported chlamydia morbidity decreased substantially for the first time in eight years with 16,723 cases reported, a decrease of 5.8% (-1,024 cases) when compared to 2003 (Figure 20). This decrease is attributed to the impact of sustained, increased screening activities, especially among adolescent males and females in 2003 and 2004 which resulted in the identification and treatment of 9,138 persons in 2003 and 8,623 persons in 2004 through our citywide screening program. The number identified and treated includes 1,112 high school students in 2003 and 960 high school students in 2004. The elimination of these individuals from the reservoir of predominantly asymptomatic, infected persons during these two years combined with ongoing screening and treatment efforts is credited with the progress we have made in reducing reported morbidity.

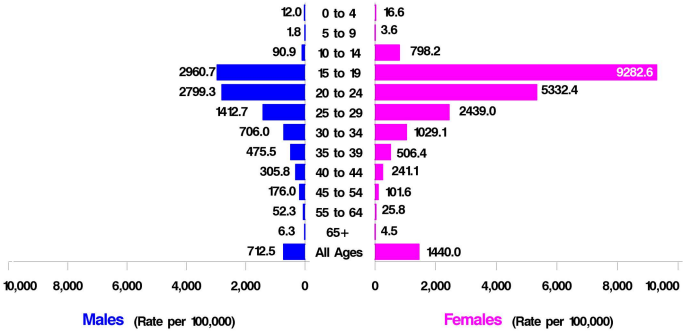
Figure 20. Reported Cases of Chlamydia: Philadelphia, 1992–2004



Rates of reported chlamydia infection in women are consistently much higher than in men (Figure 21). In 2004, the rate among women 15-19 years old was 9,283 per 100,000 population and compared to men at 2,961. The highest rates among males and females were in this age group. In 2004, there continued to be a disproportionate number of females reported, resulting in a F/M ratio of 2.3:1; this is down, however, from F/M ratios of 3.9:1 in 2001, 2.4:1 in 2002 and 2.6:1 in 2003.

Overall, the number of male cases of chlamydia identified in 2004 increased 130.1% (+2,841 cases) compared to 1999, due primarily to the increased screening among asymptomatic males noted above.

Figure 21. Rates of Chlamydia per 100,000 Population by Age and Gender: Philadelphia, 2004



The identification and treatment of males is critical to reduce both the high reinfection rates of women (25% within 5 years) and the continued spread of infection in the community.

Note: Screening of asymptomatic men and women in both traditional and nontraditional venues has become feasible and is now widely available with noninvasive, urine-based tests using nucleic acid amplification methods. Urine-based screening of young men and women was initiated at the end of 1999 primarily in the Youth Study Center of the Philadelphia Corrections System. Screening efforts expanded during the period 2001-2004 to include District Health Care Center clinics, Adult Prisons, Philadelphia Public High Schools and Family Court. In total, in 2004, 154,612 tests for chlamydia were performed through the citywide screening program with 9,763 (6.3%) positives identified. In 2003, 153,324 tests for chlamydia had been performed through this program with 10,541 (6.9%) positives identified; this compares to 2002 when 108,893 tests were performed with 8,246 (7.6%) positives identified.

Lymphogranuloma Venereum (LGV)

LGV is a systemic sexually transmitted disease (STD) caused by invasive strains of *Chlamydia trachomatis* (serovars L1, L2, L3). The primary lesion of LGV is a small genital or rectal papule, ulcer or erosion that appears at the site of inoculation and may or may not be painful. These lesions may be clinically similar to the lesions of genital herpes, primary syphilis, or chancroid. Among men who have sex with men (MSM), lesions may be anorectal and therefore not easily observed. The incubation period from exposure to developing a lesion is 3-30 days. A secondary stage of LGV infection (the anogenitorectal, or inguinal syndromes) may occur several months after exposure. The anogenitorectal

syndrome is characterized by hemorrhagic or non-hemorrhagic proctitis/proctocolitis, with purulent, mucous, or bloody anal discharge, rectal pain/spasms, tenesmus, or constipation. The inguinal syndrome is characterized by inguinal or femoral adenopathy that may go on to suppurate and ulcerate (buboes). Untreated, the secondary stage manifestations of LGV may progress to genitorectal fistulae, strictures, or genital elephantiasis.

While there have been no cases of LGV reported in Philadelphia in many years, there have been recent cases of LGV reported in the United States (specifically San Francisco, Atlanta and New York). Those patients identified have been MSM with high rates of HIV co-infection, multiple sexual partners, unprotected anal intercourse and have presented with hemorrhagic proctitis/proctocolitis.

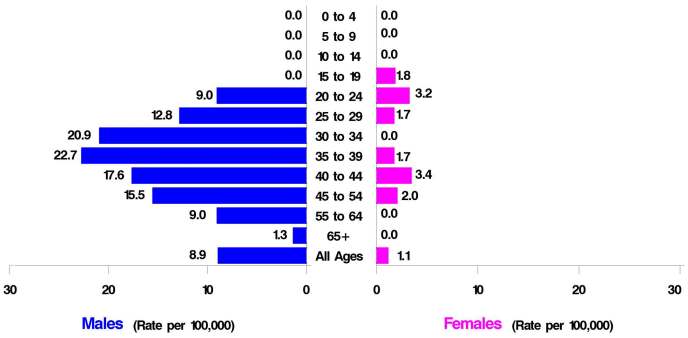
There is both serologic testing and local site testing available for LGV testing. Rectal specimens can be collected using the collection swabs and tubes for standard DNA hybridization (GenProbe) or DNA amplification tests (BD, GenProbe, TMA, Roche). If test kits are not available, then a sterile dry swab can be used. For serologic testing 5 cc of blood in a red topped tube should be collected. The Philadelphia Department of Public Health (PDPH) is working with the Centers for Disease Control and Prevention (CDC) to provide specific testing. Contact the STD Control Program (215-685-6741) with suspected cases to discuss specimen collection and arrange for testing.

Gonorrhea (*Neisseria gonorrhoeae*)
In 2004, there were 5,206 cases of gonorrhea reported in Philadelphia. This is a 9.2% decrease [-525 cases] from 2003. This was the fourth annual decrease in reported cases of gonorrhea. Teenagers and young adults remain disproportionately affected, with 54.3% of the cases (2,827) occurring among 15-24 year-olds.

While there was little PDPH-supported routine screening of asymptomatic men for gonorrhea in 2002 (1,991 tests; 25 positives), in 2003 53,644 males were screened for gonorrhea, with 489 (<1%) found to be infected. In 2004, 57,242 males were screened with 764 (1.3%) infected. The dramatic increase in the number of males tested was due to enhanced screening efforts that made use of a laboratory test that could detect both *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. While a large proportion of men infected with gonorrhea will be symptomatic and seek medical care, routine screening in women remains necessary as women are likely to have subtle or no symptoms. In 2004, PDPH provided/supported 97,370 screening tests for gonorrhea among females resulting in the identification of 1,242 (1.3%) infected women; this accounted for more than 46.3% of the total cases of gonorrhea reported in women (2,680). As with chlamydia, women with gonorrhea who are untreated are at risk of developing complications, including pelvic inflammatory disease (PID), that may lead to infertility and increase the chance of ectopic pregnancy. Increased screening and educational efforts targeted at young, asymptomatic men and women will be needed to have a continued impact on this disease.

Early Syphilis (*Treponema pallidum*)
Reported primary and secondary (P&S) syphilis morbidity in 2004 decreased 26.5%, from 98 to 72 cases, when compared to 2003. Since 1990, the peak year of our most recent syphilis epidemic, there has been a 97.0% overall decrease in reported P&S syphilis from the 2,361 cases reported in that year. This overall decrease may be attributed to many factors including saturation of the at-risk population, increased use of condoms and reductions in unprotected sexual activity resulting from educational messages targeting HIV and STD prevention, and the disease intervention activities of the Philadelphia STD Control Program which aggressively provided testing and preventive treatment to contacts of early syphilis cases. Reported early latent syphilis cases have also declined 96.1% (-3,756 cases) since the peak of the epidemic in 1990 when 3,907 cases were reported. In 2004, 151 cases were reported; this represents a decrease of 22.2% (-43 cases) when compared to 2003. Reported rates of P&S and early latent syphilis were higher among men than women in 2004 (Figure 22). The cause may be multifactorial, including an increase in the percent of male P&S cases attributable to men who have sex with men, from 0.9% in 1995 to 69.8% (44 of 63 males) in 2004, and an increased likelihood that a male will notice a lesion on his genitalia and be diagnosed. The rates of syphilis remain higher among blacks than whites and hispanics, although this racial disparity is narrowing.

Figure 22. Early Syphillis Rates per 100,000 Population by Age and Gender: Philadelphia, 2004

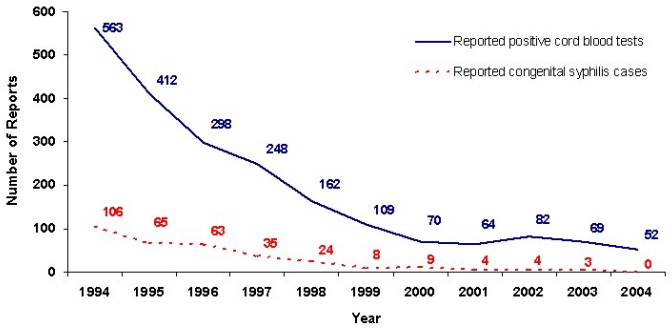


With rates of infectious syphilis at an all time low in the United States, CDC launched a National Plan to Eliminate Syphilis by 2005. The Philadelphia STD Control Program, in conjunction with this effort, initiated a weekly syphilis outbreak surveillance report and established thresholds for reported morbidity above which outbreak control activities are initiated. In addition, liaisons with community-based organizations have been established and intensified syphilis case management activities have been maintained.

Congenital Syphilis

In 2004, no cases of syphilis in Philadelphia newborns met the current CDC surveillance definition for congenital syphilis; 3 cases were reported in 2003. The 2004 figure represents a 100.0% (-301 cases) decrease when compared to 1991, the peak year since the reporting definition changed in 1990. Of particular note is the number of reactive cord blood/maternal serologic tests for syphilis detected at delivery (Figure 23). This number decreased from 82 in 2002 to 69 (-15.9%) in 2003 to 52 (-24.6%) in 2004. Since 1992, we have seen an overall 94.0% (-812/864 reports) decrease. The occurrence of congenital syphilis is directly linked to the incidence of early syphilis in the city. Adequate prenatal care, with routine screening and treatment of syphilis in pregnant women clearly plays a major role in preventing congenital syphilis.

Figure 23. Reported Cases of Congenital Syphilis and Positive Cord Blood Tests: Philadelphia, 1994 to 2004



STD Screening in Philadelphia Public High Schools

Reported morbidity for *Chlamydia trachomatis* in Philadelphia continues to disproportionately affect adolescents in the 15-19 age group. (see figure 21, above). In 2004 the rate of chlamydia infection in girls and boys between the ages of 15-19 years was 9,283 and 2,961 per 100,000 population, respectively. While reported cases among boys remain lower than among girls, they have increased as screening programs reach them for testing. (2,246 in 2002; 3,102 in 2003; 2,961 in 2004). In general, lower rates among adolescent males may be attributed to a number of factors including limited availability of routine screening, behavioral traits, and physiological/anatomic differences between males and females that may affect susceptibility, duration of infection and sensitivity of testing.

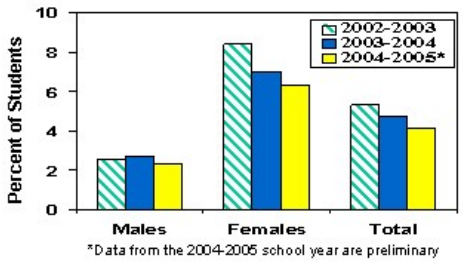
Because the CDC's 2001 Youth Risk Behavior Survey of High School Students indicated that 62% of Philadelphia students had been sexually active, PDPH determined that diagnosis and treatment of STDs in adolescents should become a priority. Continued advances in testing technology, such as non-invasive urine-based testing for chlamydia and gonorrhea, made large-scale screening of adolescents feasible. Thus, in January 2003, PDPH and the School District collaborated to initiate a citywide voluntary screening effort including all public high schools. Between January and December of 2003, 21,000 students were screened. Of the 10,108 females screened, 8.5% (859/10,108) were found to be infected with either chlamydia (765), gonorrhea (39) or both STDs (55); of the 10,892 males who were screened 2.8% (302/10,198) were found to be infected with either chlamydia (284), gonorrhea (10) or both STDs (8). Of those who tested positive, 99.8% (1,159/1,161) were treated. In 2004, 21,067 students were screened. Of the 10,106 females screened, 7.2% (728) were found to be infected with chlamydia (646), gonorrhea (40) or both STDs (42); of the 10,961 males screened, 2.6% (284) were found to be infected with chlamydia (262), gonorrhea (12) or both STDs (10). Of those who tested positive, treatment was confirmed for 99.4% (1,006/1,012).

During the 2003 calendar year, ongoing testing was also provided at the 5 high schools which provided Health Resource Centers (HRC) to their students. These centers offer counseling and referral services for STD, HIV and family planning. They also provide condoms to students whose parents have not opted them out of the program. These 5 schools screened 2,737 students in 2003. Of the 1,422 females tested, 12.8% (182) were found to be infected, 155 with chlamydia only, 11 with gonorrhea only and 16 with both STDs. Of the 1,315 male students tested, 4.9% (65) were found to be positive, 53 with chlamydia only, 6 with gonorrhea only, and 6 with both. Of those who tested positive, 96% (237) were treated.

In 2004, testing continued through these HRCs with a total of 2,266 students screened. Of the 1,254 females tested, 12.5% (157/1,254) were found to be infected with chlamydia (130), gonorrhea (17) or both (10) STDs. Of the 1,012 male students tested, 3.6% (36/1,012) were found to be positive for chlamydia (33) or both (3) STDs. Of those who tested positive, 99% (191/193) were treated.

In 2004, the two screening programs combined identified more that 1,200 students infected with chlamydia, gonorrhea or both STDs. The treatment of these students prevented hundreds of cases of PID and prevented the transmission of these infections to hundreds more. The graph (Figure 24) below reflects changes in positivity rates during each of the three school years. Clearly, progress has been made. The STD Control Program continues to search for new venues and innovative programs to reach adolescents, who are disproportionately affected by these diseases.

Figure 24. Percent of Students Testing Positive for CT and/or GC by Sex and School Year



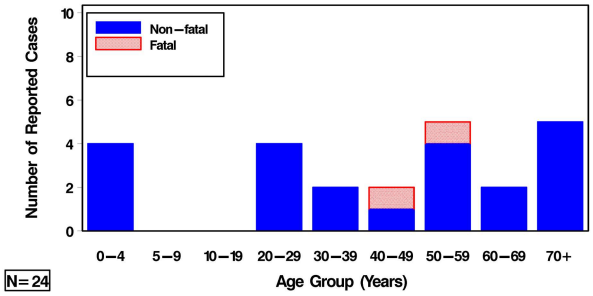
Other Reportable Diseases and Conditions

Group A *Streptococcus*, Invasive

Group A *Streptococcus* (GAS) causes a spectrum of human infections, from pharyngitis and mild soft-tissue infections to life-threatening toxic shock. Invasive GAS infections have been a reportable condition in Philadelphia since 2001, but this is the first year that the disease will be addressed in a distinct reporting category. A confirmed case of invasive GAS infection is defined by the Centers for Disease Control and Prevention (CDC) as any infection where the organism is isolated from a normally sterile site, e.g., blood, cerebrospinal fluid, or less commonly, joint, pleural, or pericardial fluid. Cases of Streptococcal Toxic Shock Syndrome (STSS) with laboratory confirmation are included in this definition. GAS is typically spread through direct contact with infected pharyngeal secretions, skin, and wounds.

In 2004, there were 24 reported cases (citywide incidence 1.6 per 100,000 persons) of invasive GAS infections, including 3 cases of STSS. GAS was isolated from blood in 23 of the 24 cases. Thirteen cases (54%) were males. Five cases (21%) were fatal, though this is probably an underestimated figure, as not all cases were followed extensively. The age and death distribution of cases is shown in Figure 25. The incidence of invasive GAS in Philadelphia is similar to national incidence of the disease (1.52 per 100,000 persons in the US in 2004).

Figure 25. Group A Strep by Age and Death Status: Philadelphia, 2004



In late 2004, the Division of Disease Control (DDC) investigated a cluster of 6 GAS cases in an acute long-term care hospital. Two of the 6 cases were invasive; one of these was fatal. Retained GAS isolates from these patients were typed by emm gene sequencing and found to be identical. Review of the medical records and inspection of the facility indicated fomites as a possible mode of transmission. DDC is available to help identify and investigate GAS clusters, facilitate collection and transport of clinical specimens for molecular typing, and offer guidelines for the management of institutional outbreaks.

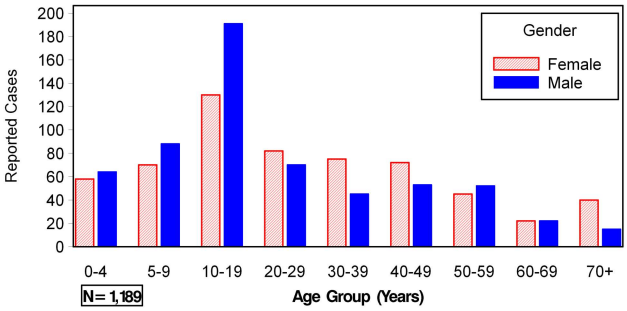
Animal Exposures and Animal Rabies Testing

In Philadelphia, animal bites are reportable to DDC. In addition, DDC maintains records of other reported animal exposures, such as scratches or contact with bodily fluids, requiring evaluation for the risk of rabies exposure. In 2004, DDC received reports of 1,353 animal exposures (including bites). In 2004, reported exposure types included 1,304 bites (96.4%), 37 scratches (2.7%) and 12 other exposures (0.9%).

Dogs and cats accounted for 74.5% and 21.3% of all reported exposures, respectively. The other species of animals with reported exposures included rats (12 cases), squirrels (10), bats (6), mice (6), hamsters (3), ferrets (3) and rabbits (3). An owner of the animal involved was identified for 60.0% of incidents. In 393 bite incidents (30.2 %), it is known that victims were bitten by a pet from their household.

Age of the bite victim was available in 1,194 (88.2%) of the exposure incidents. Among these, the median age was 19 years. For children, reported bites were more frequent among boys than among girls. The age and sex distribution of cases is in Figure 26.

Figure 26. Animal Exposures by Age Group and Gender
Philadelphia, PA, 2004



In 2004, the Philadelphia Public Health Laboratory tested 43 animals for rabies by direct fluorescent antibody staining of brain tissue. The animals tested included: cats (18); dogs (13); bats (7); fox (1); groundhog (1); raccoon (1), skunk (1), squirrel (1). Of these animals, only 1 animal (a domestic cat) tested positive for rabies. The cat was a stray kitten with a wound of unknown origin. Rabies post exposure prophylaxis was given to two Philadelphia residents who had cared for the kitten as well as to all other potential contacts.

The most recent complete US rabies surveillance data are from 2003, when 7,170 cases of rabies in animals were reported to CDC. The most commonly reported species were raccoons (36.7%), skunks (29.4%), bats (16.9%), and foxes (6.4%). Among US states, Pennsylvania ranked fourth in the number of reported rabies cases in animals in 2003 (409). These 409 animals included 234 raccoons, 80 skunks, 43 domestic cats, 35 bats, and 28 foxes.

In 2003, 3 US cases of rabies in humans were reported to CDC. One of these cases was infected with the raccoon rabies variant, the first time such an infection in humans has been documented. Preliminary national data for 2004 showed 7 cases of rabies in humans, including 4 people infected through organ transplantation. In 2004, a teenage girl in Wisconsin became the first known unvaccinated person to survive rabies infection after the onset of symptoms.

In recent years, most human cases of rabies in the United States have been associated with exposure to bats carrying the rabies virus. Therefore, in the event that a person is exposed to a bat and the bat is not available for testing, rabies post exposure prophylaxis is indicated, unless the person is certain that he/she could not have been bitten. To arrange for Rabies Fluorescent Antibody Testing of animals, or for medical consultation on the management of animal exposure incidents, contact DDC.

Special Projects

Syndromic Surveillance
In 2004, the Division of Disease Control (DDC) modified and expanded active disease surveillance by enhancing daily syndromic surveillance analysis and investigative follow-up of medical encounters from hospital emergency department (ED) triage logs. Syndromic surveillance was also created for 911 medical calls for the entire city and used as a supplement to disease trends identified by the ED surveillance system.

Clinical syndromes for the ED analysis include respiratory illness, diarrhea, vomit, asthma, cold, sepsis, rash, and fever. Analysis of fever and respiratory syndromes from the 2003-2004 influenza season was conducted by the first year EIS officer who created a fever-flu syndrome to better reflect illness associated with influenza activity in the 2004-2005 season. The fever-flu syndrome was adopted as the primary febrile infectious disease syndrome for the year-round system. One University-based hospital was added to the daily submission of ED chief complaint data in July of 2004 increasing the number of participating hospitals to 6 and increasing the average daily patient encounters from approximately 500 to 700.

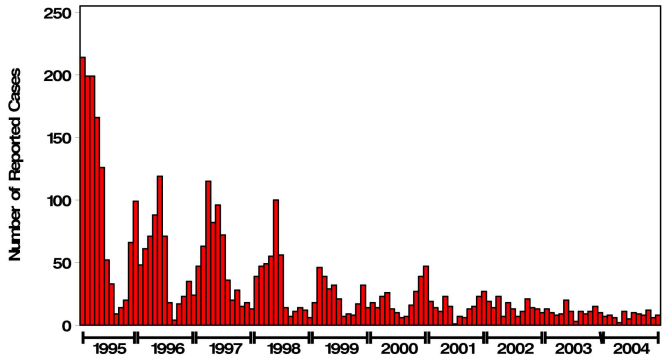
ED triage logs were analyzed daily by a staff physician, using software to detect statistical increases in syndromic rates for each hospital, and for the city. A spatial-temporal program is used to identify disease clusters using resident zip code as a geographical parameter. Response protocols have been developed as a framework for investigative follow up. An additional program identifies chief complaints that mention a reportable condition. Relationships with key staff at each hospital's medical records department have been established for follow-up of cases with reportable conditions. Relationships with participating hospital emergency departments expanded in 2004 through presentations of syndromic surveillance at emergency department grand rounds by DDC staff. Notifiable disease reporting and outbreak response protocols were also reviewed at these presentations.

Acquisition of 911 medical calls from the Philadelphia Emergency Operations Center began in November of 2004. This system is citywide and is analyzed into similar disease syndromes as the ED data. Statistical alarm detection is used in addition to spatial-temporal analysis that utilizes census tract as a geographical parameter. Follow up of alarms is conducted by hospital outreach if there is a corresponding increase in the same region of the city in the ED data for the same day.

Varicella Active Surveillance Project
The Philadelphia Department of Public Health's Varicella Active Surveillance Project (VASP) completed its 10th year monitoring the occurrence and epidemiology of varicella in the target area of West Philadelphia during 2004. VASP has continued to work with community-based sites to conduct active disease surveillance of varicella and herpes zoster (shingles) in individuals less than 20 years of age from West Philadelphia as well as varicella-related studies.

Varicella Surveillance: In 2004, a total of 92 confirmed cases of varicella were reported from the VASP surveillance area of West Philadelphia, less than year 2003 (130) and the lowest number of reported cases since 1995 (1197), the first full year of active varicella surveillance (Figure 27). Since 1995, varicella vaccine coverage rates for Philadelphia among children 19 to 35 months have increased from 43% in 1997 to 90% in 2003 and remaining somewhat level at 88% for the second half of 2003 through the first half of 2004 according to the National Immunization Survey. Primary care facilities/physicians were the greatest source of varicella case reports received by the DDC, accounting for 37% of all reported cases during the year. Emergency room departments/hospitals reported 17% of the varicella cases, while schools reported 13% of the cases. In 2004, the number of cases by age group remained dramatically lower than in 1995 when varicella vaccine was licensed for use in the United States (Table 5). Nearly two-thirds of the year 2004 cases (65%) were 1 to 9 years; however, the vast majority (93%) of these cases were vaccinated against varicella. It must be noted that school entry regulations for varicella immunity were in place for the following grades in Fall 2004: Kindergarten through Third grade and Sixth through Eighth grades.

Figure 27. Varicella, Cases by Month of Onset: West Philadelphia, 1995—2004



One confirmed varicella case from West Philadelphia was hospitalized in 2004, while 2 cases were hospitalizated in 2003. No varicella-related deaths in Philadelphia residents were reported to VASP in 2003. Only 1 varicella-related death from West Philadelphia has occurred, while 6 have occurred outside of the target area, since the start of the project.

Herpes Zoster Surveillance: Twenty confirmed zoster cases in individuals <20 years of age from West Philadelphia were reported to VASP in 2004. Private physicians were the most frequent reporting source of the zoster cases (7 cases, 35%). Ages of the zoster cases ranged from 7 to 19 years with a median age of 14 years. The annual number of confirmed zoster cases <20 years of age from West Philadelphia reported to VASP has remained somewhat level for the <1, 1-4, 5-9, and 10-14 year old age groups since 2000. However, increases in zoster cases 15-19 years of age have occurred since 2000 and may be attributed to improvements in reporting of this disease by VASP surveillance sites and the receipt of electronic billing reports for varicella and herpes zoster from hospital systems within the city of Philadelphia. Of the 20 zoster cases from year 2004, 18 (90%) reported a history of varicella; 1 (5%) reported varicella vaccination; and 1(5%) had a history of disease and also was vaccinated. One 2004 West Philadelphia zoster case <20 years of age was hospitalized.

Validity of Reported Varicella History As A Marker for Varicella Zoster Virus (VZV) Immunity Study: Both the American Academy of Pediatrics (AAP) and Advisory Committee on Immunization Practices (ACIP) recommendations for use of the varicella vaccine have exempted individuals with a reliable history of disease from receiving the vaccine, as evidence from studies conducted pre-vaccine licensure have shown a reliable history to be highly predictive of serologic immunity. Dramatic declines in varicella disease have been documented since vaccine licensure in 1995; however, reinfections among individuals with a history of primary varicella infection who are not routinely offered the vaccine may be occurring more frequently than previously considered. Inaccurate recall of disease history, misdiagnosis of varicella, and inadequate immune response following primary varicella infection are among the potential explanations for varicella reinfections. During Summer 2004, VASP in collaboration with the Centers for Disease Control and Prevention (CDC) and Children's Hospital of Philadelphia (CHOP) began enrollment for a study examining the validity of a reported varicella history as a measure of VZV immunity among unvaccinated persons aged 1 year to 29 years. The study's findings will examine current guidelines for use of the varicella vaccine and direct modifications to current policies to assure susceptible persons are offered the varicella vaccine.

During 2004, 624 participants were enrolled. VZV susceptibility rates by age group were 96% (1-4 years), 31% (5-9 years), 13% (10-14 years), 5% (15-19 years), and 4% (20-29 years). One of the 4 children aged 1-4 years whose parents reported a history of varicella was susceptible. Among those 5-9 years, sensitivity of disease history was 83% (59%-96%) and specificity was 75% (45%-100%). In this same age group, the positive predictive value (PPV) – the percentage with serologic evidence of immunity among those with a positive history – was 88% (64%-96%). Thirteen percent of the 10-14 year olds whose parents reported a positive history were susceptible. PPV among these younger adolescents (10-14 years) was 87% (79%-93%) based on a sensitivity of 80% (82%-87%) and specificity of 22% (6%-48%). PPV was high (>98%) for both the 15-19 year olds and 20-29 years olds.

Preliminary analyses suggest reported varicella history is no longer a strong indicator of VZV immunity among unvaccinated children and younger adolescents in Philadelphia. Screening for varicella vaccine using disease history among older teens (15-19 years) appears to still be warranted at lower susceptibility levels as with the study population, but may be less useful when susceptibility levels are >25%. Self-reported varicella history among young adults (20-29 years) remains an accurate indicator of VZV immunity. Data collection and analyses will continue to assess whether modifications to varicella vaccination screening practices are needed to ensure all susceptible children and adolescents are offered vaccine.

Table 5. Varicella, Cases by Age Group: West Philadelphia, 1995-2004*

	Age Group (Years)							
	<1 (%)	1-4 (%)	5-9 (%)	10-14 (%)	15-19 (%)	≥20 (%)	Missing	Total
Year								
2004	7 (8)	31 (34)	29 (32)	4 (4)	10 (11)	11 (12)	0	92
2003	11 (9)	34 (26)	34 (26)	22 (17)	5 (4)	24 (19)	0	130
2002	10 (6)	49 (29)	44 (26)	26 (15)	9 (5)	32 (19)	0	170
2001	5 (3)	46 (26)	71 (41)	17 (10)	8 (5)	27 (16)	0	174
2000	12 (5)	60 (24)	123 (49)	30 (12)	7 (3)	18 (7)	0	250
1999	11 (4)	48 (18)	133 (49)	43 (16)	19 (7)	17 (6)	0	271
1998	15 (4)	99 (24)	189 (46)	56 (14)	17 (4)	34 (8)	0	410
1997	32 (5)	166 (27)	284 (47)	52 (9)	22 (4)	49 (8)	0	605
1996	28 (5)	189 (33)	235 (41)	65 (11)	15 (3)	44 (8)	3	579
1995	36 (3)	361 (30)	533 (45)	162 (14)	39 (3)	60 (5)	6	1,197

*Removal of stratified sampling of child-care sites after year 1999. All West Philadelphia child-care centers with 15 or more attendees were included as surveillance sites starting in year 2000.

Appendix A. Antibiotic Resistance of Selected Enteric Pathogens: Philadelphia, 2004

Pathogen	Antibiotics Tested	Resistant (%)	Intermediate (%)	Total Tested
Campylobacter				
	Ciprofloxacin	12 (44)	0 (0)	27
	Erythromycin	2 (7)	0 (0)	27
Salmonella				
	Ampicillin	33 (17)	0 (0)	190
	Ceftriaxone	0 (0)	0 (0)	40
	Ciprofloxacin	0 (0)	0 (0)	165
	Trimethoprim-Sulfamethoxazole	7 (4)	0 (0)	188
Shigella				
	Ampicillin	11 (73)	0 (0)	15
	Ciprofloxacin	0 (0)	0 (0)	14
	Trimethoprim-Sulfamethoxazole	11 (69)	0 (0)	16

Notifiable Disease Case Report
(Confidential)

Philadelphia Department of Public Health
Division of Disease Control
Communicable Disease Control Program
500 S. Broad Street, Philadelphia, PA. 19146

Identification of Patient

Report Date *(Mo., Day, Yr.)*	Name *(Last, First, M.I.)*	Parent or caretaker (if applicable)

Address *(Number, Street, Apt #,City, Zip Code)*				Telephone (H) _____ (W)_____ (C) _____
DOB *(Mo., Day, Yr.)* | |	Age	Sex ☐ M ☐ F	Occupation	
Name of Employer or School		Address *(Number, Street, City, Zip Code)*		

Medical Information

Disease or Condition	Date of Onset *(Mo., Day, Yr.)* *(If animal bite ,Date it Occurred)*	Diagnosis (check one) ☐ Clinical ☐ Lab confirmed	Fatal (check one) ☐ Yes ☐ No

Chief Symptoms / Complaints	Suspected source of Infection (if known)

If Case Hospitalized *(Name of Hospital)*	Admission Date	Discharge Date

Laboratory Information If Pertinent *(Attach Copies If Applicable)*

Name of Tests Done	Site/Source	Results	Dates Done

Animal Exposures

Parts of Body Bitten	Type of Animal	Breed of Animal	Current Location Of Animal *(Indicate if available for testing)*

Name of Owner	Address of Owner *(Number, Street, Apt #, City, Zip Code)*

Reporter Information

Name of Person Reporting Case	Reporter ☐ ICP ☐ ED ☐ Other_____	Phone

Reporting Institution	Address (Number, Street, City, Zip Code)

DO NOT WRITE IN AREA BELOW - FOR DEPARTMENT USE

Name *(Person Receiving Report)*	Method of reporting ☐ Phone ☐ Fax ☐ Mail ☐ Active Surveillance ☐ Other_____

Any unusual illness, disease clusters or possible outbreaks should be reported *immediately* by telephone.
Please fax all completed reports to 215-545-8362, or call 215-685-6748 to report case by phone.

Form available at http://www.phila.gov/health/units/ddc/assets/applets/New_notifiable_disease_form.pdf

APPENDIX C ANNUAL COMMUNICABLE DISEASE TOTALS
Philadelphia Department of Public Health
DIVISION OF DISEASE CONTROL

(**NR** = Not reportable, **NA** = Not available)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
ACQUIRED IMMUNODEFICIENCY SYNDROME	1,350	1,232	1,218	1,120	833	1,281	1,000	1,043	1,109	971	857
AMEBIASIS	10	4	9	27	4	15	31	30	20	18	9
ANIMAL BITES/EXPOSURES	2,210	1,911	2,184	2,120	2,345	2,130	2,096	1,894	1,922	1,612	1,353
ANTHRAX	0	0	0	0	0	0	0	0	0	0	0
BOTULISM	0	0	0	0	0	1	1	1	3	3	0
BRUCELLOSIS	0	0	0	0	0	0	0	0	1	0	0
CAMPYLOBACTERIOSIS	211	138	193	157	142	132	148	90	97	114	96
CHLAMYDIA TRACHOMATIS	9,956	8,079	8,118	10,480	11,763	12,660	13,593	13,586	15,234	17,747	16,723
CHOLERA	0	0	0	0	0	0	0	0	0	0	0
CRYPTOSPORIDIOSIS	NR	24	20	14	14	24	22	13	15	19	19
CYCLOSPORIASIS	NR	NR	NR	NR	NR	NR	NR	1	0	2	0
DIPHTHERIA	0	0	0	0	0	0	0	0	0	0	0
ENCEPHALITIS , excluding West Nile Virus	0	0	1	5	0	1	1	5	6	9	6
ESCHERICHIA COLI O157:H7	NR	7	5	3	6	7	6	42	17	14	11
GIARDIASIS	165	182	180	179	130	105	132	120	135	113	104
GONORRHEA	8,026	6,565	6,415	6,504	7,271	7,776	8,170	8,061	7,277	5,731	5,206
GUILLIAN-BARRE SYNDROME	1	2	1	1	0	2	3	2	2	0	0
HAEMOPHILUS INFLUENZAE [type b]	NR [1]	NR [5]	NR [4]	NR [2]	NR [0]	NR [0]	NR [0]	7 [1]	8 [1]	14 [1]	9 [0]
HEPATITIS A	30	22	269	176	133	62	255	98	70	179	39
HEPATITIS B, ACUTE	147	104	134	171	155	152	134	111	97	51	60
HEPATITIS C, ACUTE, (Non-A, Non-B until 1998)	4	1	0	7	0	3	1	1	4	3	0
HISTOPLASMOSIS	0	0	0	1	0	0	2	1	2	2	2
LEGIONELLOSIS	4	4	8	9	15	15	19	3	10	23	31
LEPTOSPIROSIS	0	0	0	0	0	0	0	1	1	0	0
LISTERIOSIS	NR	NR	3	6	5	10	12	8	19	11	11
LYME DISEASE	152	206	225	184	179	220	165	99	179	164	182
MALARIA	11	4	8	10	11	10	11	16	16	19	13
MEASLES	2	0	1	7	1	0	0	1	0	0	0
MENINGITIS, aseptic	10	16	11	39	26	25	68	71	112	120	87
MENINGITIS, bacterial	23	20	10	32	12	15	23	15	21	7*	4*
MENINGOCOCCAL INFECTIONS	15	13	18	15	13	13	24	12	15	15	14
MUMPS	4	7	9	5	1	5	2	1	1	2	1
PERTUSSIS	58	29	100	46	31	44	61	34	31	98	109
PLAGUE	0	0	0	0	0	0	0	0	0	0	0
POLIOMYELITIS	0	0	0	0	0	0	0	0	0	0	0
PSITTACOSIS	0	1	0	0	0	0	0	0	0	0	0
RABIES (Human)	0	0	0	0	0	0	0	0	0	0	0
RICKETTSIAL DISEASES, including RMSF	0	0	1	1	1	4	0	2	4	0	7
RUBELLA, including congenital rubella syndrome	0	0	1	0	1	0	0	0	0	0	0
SALMONELLOSIS, excluding typhoid	332	472	424	395	319	346	328	287	324	316	261
SHIGELLOSIS	91	293	412	361	123	129	115	139	191	696	31
STREP PNEUMONIAE, INVASIVE	NR	NR	NR	NR	NR	NR	NR	NR	NR	101	94
STREPTOCOCCUS, INVASIVE Gp. A [# with TSS]	NR	NR	NR	NR	NR	NR	NR	14 [7]	16 [1]	43 [3]	24 [3]
SYPHILIS - PRIMARY & SECONDARY	298	199	141	108	89	69	67	77	71	98	72
SYPHILIS - CONGENITAL	106	65	63	35	24	8	9	4	4	3	0
SYPHILIS - TOTAL	2,006	1,299	1,298	1,091	796	826	622	639	589	587	470
TETANUS	0	0	0	1	0	0	0	0	0	0	0
TOXIC SHOCK SYNDROME, staphylococcal	0	0	0	2	1	0	0	0	1	0	0
TOXOPLASMOSIS	0	0	0	1	2	3	2	3	0	0	1
TUBERCULOSIS	276	309	250	233	179	184	169	144	147	120	129
TULAREMIA	0	1	1	0	0	0	0	0	0	0	0
TYPHOID FEVER	0	6	2	1	4	1	2	2	1	1	2
WEST NILE VIRUS	NR	NR	NR	NR	NR	NR	0	2	6	24	1
YELLOW FEVER	0	0	0	0	0	0	0	0	0	0	0

* excluding *Neisseria meningitidis*, *Haemophilus influenzae, Listeria,* and invasive *Streptococcus pneumoniae.* Beginning in 2003, *S. pneumoniae* meningitis was counted with other *S. pneumoniae* cases.