City of Philadelphia
Department of Public Health
John F. Domzalski, Commissioner

Annual Summary of Reportable Diseases and Conditions: Division of Disease Control, 2003

Division of Disease Control

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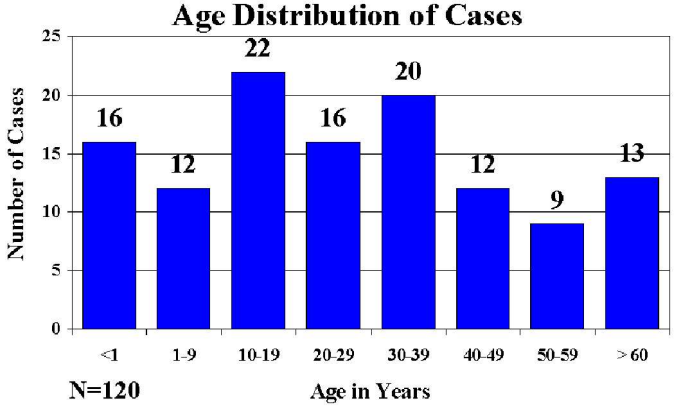
Table of Contents

CENTRAL NERVOUS SYSTEM INFECTIONS AND SEPSIS

Aseptic Meningitis

In 2003, 120 cases of aseptic meningitis were confirmed among Philadelphia residents. This is the fourth year with an increase in aseptic meningitis cases. The surge of cases corresponds with the emergence of West Nile Virus infections in the United States. It is unlikely that Philadelphia has experienced a true increase in aseptic meningitis, but rather improved case finding and reporting by clinicians who suspect West Nile Virus infections among their patients. Almost certainly, reporting of aseptic meningitis cases to the Philadelphia Department of Public Health (PDPH) is biased towards those with more severe clinical presentations. Of 120 cases, 109 were hospitalized for at least 24 hours. Milder cases that did not require hospitalization were probably not reported.

Figure 1. Aseptic Meningitis, Philadelphia 2003
Age Distribution of Cases



Forty-two percent of aseptic meningitis cases occurred in persons 19 years of age or younger (Figure 1). Males and females were equally affected. The sole fatality occurred in an elderly male. Enterovirus was laboratory confirmed as the etiology for 19 cases. Because disease onset for more than half occurred between the months of July and November (Figure 2), an enteroviral etiology was likely for many more than just those that were laboratory confirmed. Forty-one of 120 patients with aseptic meningitis had WNV testing performed, all were negative. There were no outbreaks of aseptic meningitis or relationships between reported cases.

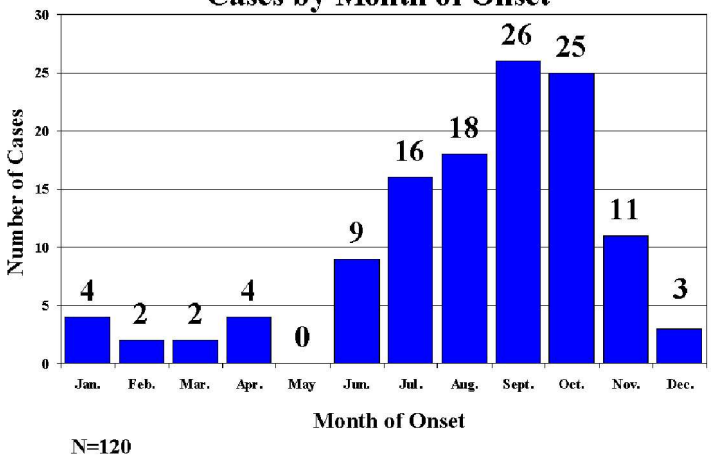
Haemophilus influenzae

All serotypes of *H. influenzae* recovered from a normally sterile body site are considered notifiable in Philadelphia. The purpose of conducting surveillance on all serotypes is to promote submission of isolates for serotype analysis, to enhance the identification of vaccine-preventable *H. influenzae* type B infections, and to characterize the epidemiology of non-type B infections.

In 2003, 13 cases of invasive *H. influenzae* infection were reported. The age distribution of cases was less typical than in previous years, as there were more non-infant and non-elderly cases reported in 2003. Eleven cases presented with primary bacteremia, and 2 with bacteremic pneumonia. Two fatalities occurred - one in an elderly person co-infected with *Streptococcus pneumoniae* and the other in a 51-year-old patient with unknown underlying risks.

The Division of Disease Control (DDC) collected isolates for serotype analysis in the Philadelphia Public Health Laboratory. Nine of the pathogens were non-typeable, while 3 were type A, and 1 was type B. The sole type B infection occurred in a 46 year-old, who had contact with a 2-year old child. The child's immunization status was age appropriate.

Figure 2. Aseptic Meningitis, Philadelphia 2003
Cases by Month of Onset



Listeriosis (*Listeria monocytogenes)*

Eleven cases of *Listeria* infection were reported in 2003. The clinical diagnoses for these patients were 6 primary bacteremias, 3 meningidities, and 2 septic arthridities. Three (27%) of the infections occurred in women, and 8 (73%) occurred in individuals aged 65 years or older. The number of cases identified in 2003 was lower than in 2002, when a large outbreak of listeriosis in the Philadelphia region occurred as a result of eating contaminated sliced deli turkey. Unique risk factors for 2003 patients include kidney disease (3/11), malignancy (2/11), solid organ transplant (2/11), corticosteroid treatment (2/11), HIV/AIDS (1/11), and none/unknown (1/11). The two reported fatalities occurred in persons aged 76 and 86 years. No common food exposure or source was identified for these 11 cases.

Meningococcal Infection (*Neisseria meningitidis*)

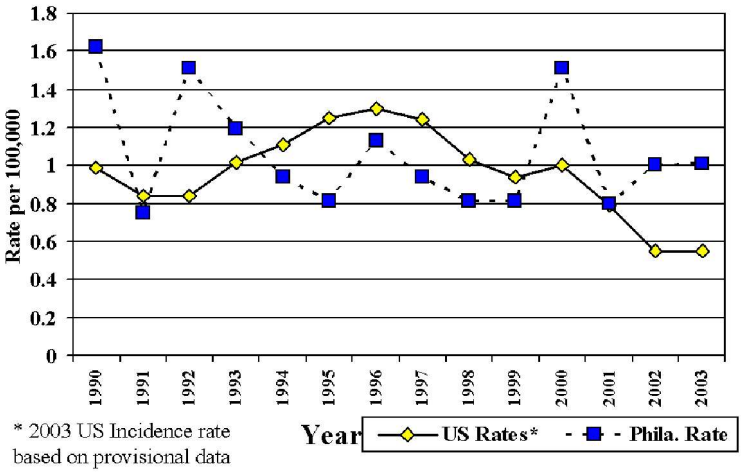
In 2003, 15 cases of meningococcal infection were microbiologically confirmed. Five cases (33%) presented with meningitis, 9 cases (60%) with primary bacteremia,and 1 with a synovial infection (7%). The age distribution for the 15 cases is shown in Figure 3.

Figure 3. Meningococcal Infections, Philadelphia 2003
Age Distribution of Cases

N=15

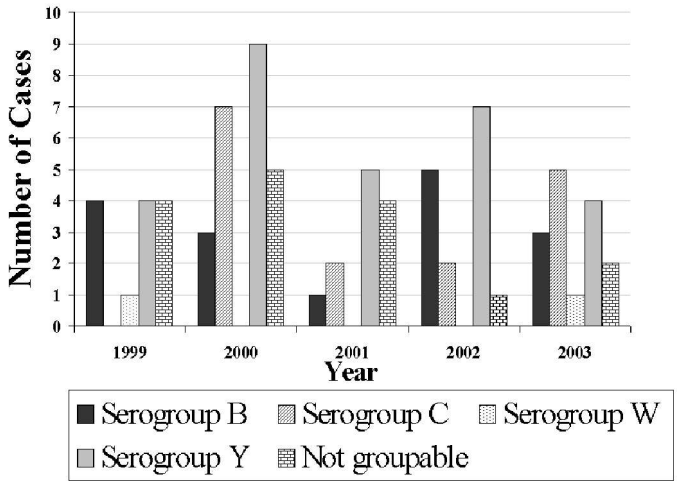
The incidence of meningococcal disease in Philadelphia for 2003 was 1.0 per 100,000 persons, which is slightly higher than the national rate (Figure 4). Unlike previous years when serogroup Y predominated, serogroup C was the most common in Philadelphia in 2003 (Figure 5). There were 2 fatalities (13%) among the 15 cases - ages 17 and 23 years.

Figure 4. Meningococcal Infections, United States and Philadelphia 1990-2003 Rates of Infection



One case of meningococcal infection occurred in a 2-year old who attended daycare. In accordance with recommendations from the Centers for Disease Control and Prevention (CDC), all children in the same daycare classroom were administered antibiotic prophylaxis. Although 2 infections occurred in children attending Philadelphia schools, prophylaxis was not indicated for classmates. The risk of disease transmission in a standard classroom setting is no greater than in the general population. There was also a single case of meningococcal disease (serogroup C) in a Philadelphia college student, who had received the meningococcal vaccine 3 years prior. Close contacts received prophylaxis, as indicated. Meningococcal vaccine provides protection against serogroups A, C, Y, and W-135, but does not protect against serogroup B, which accounts for at least 25% of cases in the US.

Figure 5: Meningococcal Infections, Reported Serogroups Philadelphia 1999 – 2003



The CDC recommends that practitioners providing medical care to freshmen college students, particularly those planning to live in dormitories, discuss meningococcal disease and the potential benefits of vaccine with students and their parents. The General Assembly of the Commonwealth of Pennsylvania Senate Bill No. 955 P.N. 2102, the 'College and University Student Vaccination Act,' requires Pennsylvania college students residing in dormitories to receive one-time meningococcal immunization unless they are exempted (signed written waiver after receiving appropriate written information about the disease and effectiveness of vaccine). The Act does not require institutions of higher learning to provide or pay for the meningococcal vaccine.

Streptococcus pneumoniae, Invasive

Although DDC has been collecting reports of invasive pneumococcal infections since 2002, this is the first year that invasive *Streptococcus pneumoniae* will be addressed as a distinct reporting category. (In prior years, cases of pneumococcal meningitis were included under the generic category of Bacterial Meningitis). During 2003, there were 101 cases of invasive pneumococcal infections reported to DDC, for a citywide incidence of 6.7 cases per 100,000 population. The clinical infections included 74 primary bacteremias, 13 meningidities, 13 pneumonias, and 1 brain abscess. Fifty-two percent of cases were males. Eight deaths were identified (8%), although this likely underestimates true mortality rate, as not all cases were followed to determine a final outcome. The age and death distribution of Philadelphia cases is shown in Figure 6. Antibiotic susceptibilities of *Streptococcus pneumoniae* isolates were available for 93 of 101 reported cases. Thus, for the most part, Philadelphia hospitals appear to be following CDC recommendations to perform routine testing on all clinically relevant pneumococcal isolates. Test methodologies varied between institutions but all appeared to be consistent with NCCLS approved guidelines. DDC used the CDC case definition for determining non-susceptible infections, i.e., those strains that demonstrate 'intermediate- or high-level resistance…to at least one antimicrobial agent currently approved for use in treating pneumococcal infection'. Fifteen of 93 (16%) isolates were found to be non-susceptible to penicillin. Most non-penicillin susceptible infections occurred in adults (Figure 7). Risk factors for infection with an antibiotic-resistant strain of *S. pneumoniae* were not investigated this year, but will be investigated in the future.

Figure 6. Age and Survival of Patients with Invasive *Streptococcus pneumoniae*, Philadelphia 2003

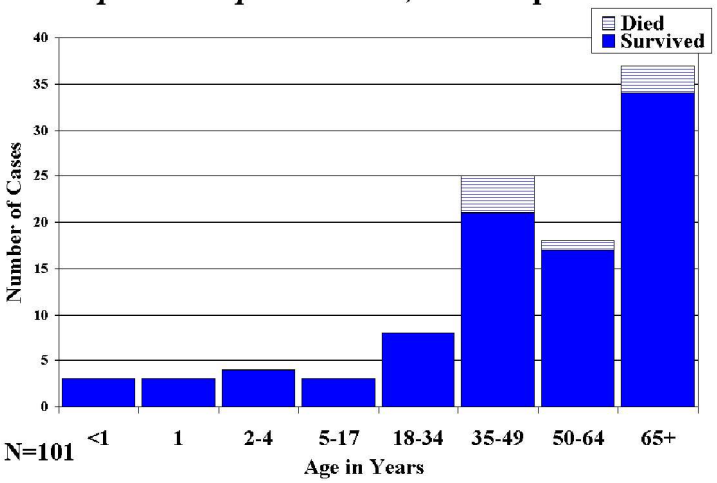
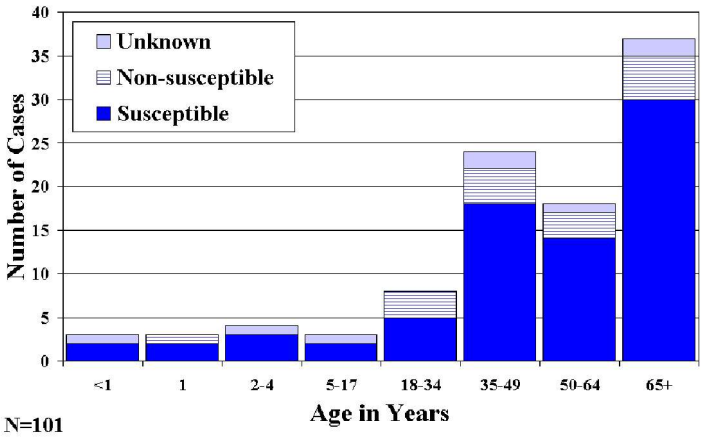


Figure 7. Invasive *Streptococcus pneumoniae* Infections by Age and Penicillin Susceptibility, Philadelphia 2003



Bacterial Meningitis, Other

Seven microbiologically confirmed cases of bacterial meningitis (excluding *Neisseria meningitidis, Haemophilus influenzae, Listeria,* and invasive *Streptococcus pneumoniae,* which are reported as specific etiologic agents) were identified in 2003. The etiologic agents included 4 Group B *streptococci,* 1 *Staphylococcus aureus,* 1 *Enterococcus,* and 1 *Pasteurella multocida.* There were no recorded fatalities reported among these patients, although follow-up was limited.

GASTROINTESTINAL INFECTIONS

Campylobacteriosis (*Campylobacter spp.)*

One-hundred-twelve confirmed and two probable cases of *Campylobacter* infections were reported among Philadelphia residents in 2003. Fifty of the 112 cases had serotype data, all of which were identified as *C. jejuni.* Common reported risk factors during the incubation period for disease included animal contact (28%) and foreign travel (12.3%). No case clusters were identified. Symptoms reported by the cases included diarrhea (90.4%), abdominal pain (64.0%), nausea (18.4%), vomiting (22.8%) and fever (64.0%). Nineteen cases required hospitalization; no fatalities were reported.

Thirty-eight (34%) confirmed cases had antibiotic susceptibility testing performed (Appendix 1). Two of 34 (6%) *Campylobacter* isolates tested for both erythromycin and ciprofloxacin susceptibility were resistant to both antibiotics. Philadelphia *Campylobacter* resistance patterns are similar to 2001 CDC data (75/384 or 19% ciprofloxacin resistant; 8/384 or 2% erythromycin resistant).

Cryptosporidiosis (*Cryptosporidium parvum)*

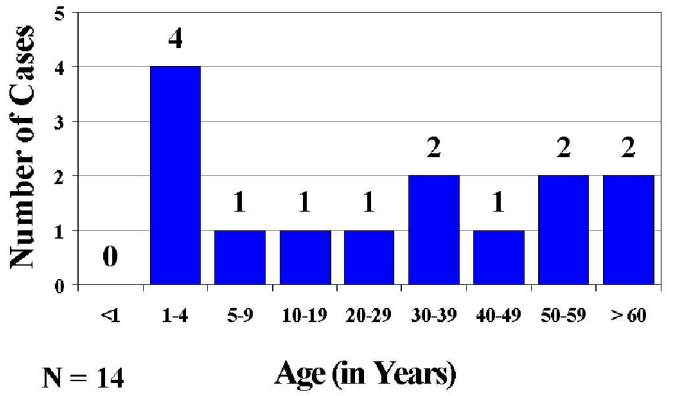
In 2003, 19 cases of cryptosporidiosis (9 males, 10 females) were laboratory-confirmed in Philadelphia residents. This represented a 21% increase from the previous year. Many cases (47%) were reported from August through October. Cases in the 20-29 (n=7) and 40-49 year old (n=7) age groups comprised 74% of all cases. The most frequent risk factor for presumed acquisition of infection was travel outside of Philadelphia (7/19, 37%); most to foreign countries (4/7). Six (32%) cases were immunocompromised. Of these, 1 fatality occurred in a case with a 5-year history of an underlying immunocompromising condition. Thirty-three percent of those with data available (5/15) required hospitalization. No common source outbreaks were identified.

E. coli (Escherichia coli) O157:H7

Fourteen cases of *E. coli O157:H7* infection were identified in 2003; 3 cases (21%) were culture confirmed. Eleven (79%) had a positive shiga-toxin test and were classified as probable cases. Cases were predominantly white (93%), not Hispanic (100%), and female (71%). Most cases were between the ages of 1 and 4 years (Figure 8). Symptoms reported by cases were as follows: diarrhea (100%), abdominal cramps (57%), fever (14%), and bloody diarrhea (29%). Although there were no deaths or hemolytic-uremic syndrome, 2 persons were hospitalized due to the severity of symptoms.

In July, 2 cases having onsets 1 day apart reported petting animals at the same zoo. The petting areas of the zoo were closed to the public until after all animals in contact with humans were tested for the presence of *E. coli O157:H7.* Rectal swabs were performed in duplicate on each animal; one was tested at the zoo lab and the other by the Philadelphia Public Health Laboratory. All cultures were negative. No link was made between the 2 cases or to a source of infection and the zoo reopened. One of these 2 children had a sibling that developed a diarrheal illness 8 days after onset of the index case. No other potentially related cases were identified in Philadelphia or the surrounding counties.

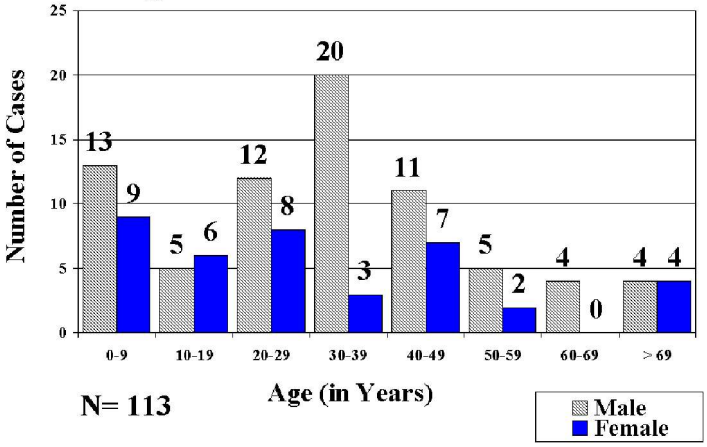
Figure 8. *E. coli* O157:H7, Philadelphia 2003
Age Distribution of Probable and Confirmed Cases



Giardiasis (*Giardia lamblia)*

One hundred thirteen cases of laboratory -confirmed giardiasis were reported in Philadelphia residents in 2003. Most cases occurred in men in the 30-39 year old age group. The age and gender distribution of cases are shown in Figure 9.

Figure 9. Giardiasis, Philadelphia 2003
Age and Sex Distribution of Cases

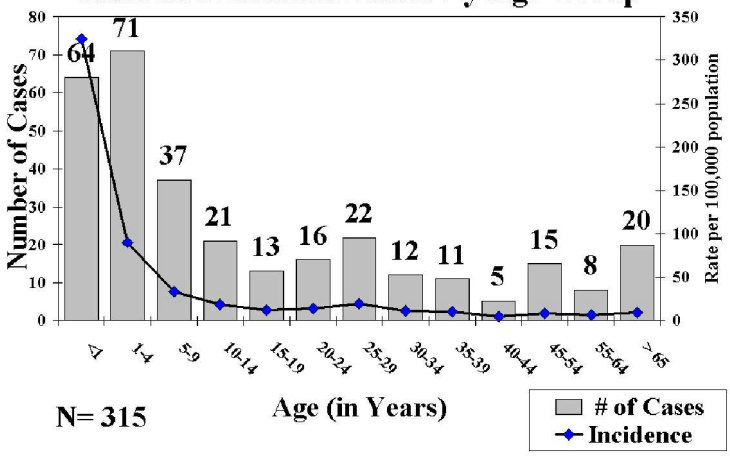


Symptoms reported by the cases included diarrhea (70.8%), abdominal pain (40.7%), nausea (25.7%), vomiting (27.1%) and fever, (22.1%) each. Although 16.1% of cases were known to require hospitalization, there were no fatalities. Travel to a foreign country in the month before illness onset was reported by 31 of 113 cases (27.4%). The most common countries associated with disease acquisition among the foreign travelers were Costa Rica, Ghana, Liberia, and India.

Salmonellosis (*Salmonella)*

Three hundred sixteen reports met the CDC case definition for salmonellosis in 2003. Of these, 309 were culture confirmed and 7 were classified as probable (lacked a stool culture but were epidemiologically linked to a laboratory-confirmed case). Salmonellosis affected males and females in equal proportions (158 cases each). Cases ranged in age from <1 to 101 years. The incidence was highest among children less than five years of age (Figure 10); this age group comprised 42.7% of total salmonellosis cases. Incidence in this age group is essentially unchanged from 2002.

Figure 10. Salmonellosis, Philadelphia 2003
Cases and Incidence Rates By Age Group



Of the 276 persons located for an interview, symptoms included: diarrhea (93%), fever (66%), abdominal pain (52%), vomiting (33%), and nausea (17%). Sixteen percent of cases were hospitalized. Although 1 fatality was reported in a 77-year-old male with a diagnosis of salmonellosis, his cause of death was an acute myocardial infarction. The most common reported risk factor for contracting salmonellosis was animal contact (99/276 of 35.9%). Serotype information was available for 293 cases. The majority were *S. typhimurium* (91 isolates, 31%) or *S. enteritidis* (88, 30%). Although 17 (5.8%) cases were infected with a reptile-associated serotype, only 6 cases (2.2%) reported having contact with a reptile.

Antibiotic susceptibility results were available for 233 (75%) *Salmonella* isolates (Appendix 1). Resistance to trimethoprim/sulfamethoxazole and ciprofloxacin was similar to 2001 CDC data, but 2003 resistance to ampicillin in Philadelphia was slightly higher.

Typhoid fever (*Salmonella* ser. Typhi)

Only 1 case of typhoid fever was reported to PDPH DDC in 2003. A 29-year old female presented to a local Emergency Department with a high fever and spontaneous abortion. It remained uncertain as to where the case had acquired *S. typhi.* She reported regularly eating 'soft eggs' and a 3-week visit to Haiti; however, travel had been 7-8 months prior to symptom onset. The isolate was sensitive to chloramphenicol, ampicillin, fluoroquinolones and trimethoprim/sulfamethoxazole. The case was hospitalized and recovered.

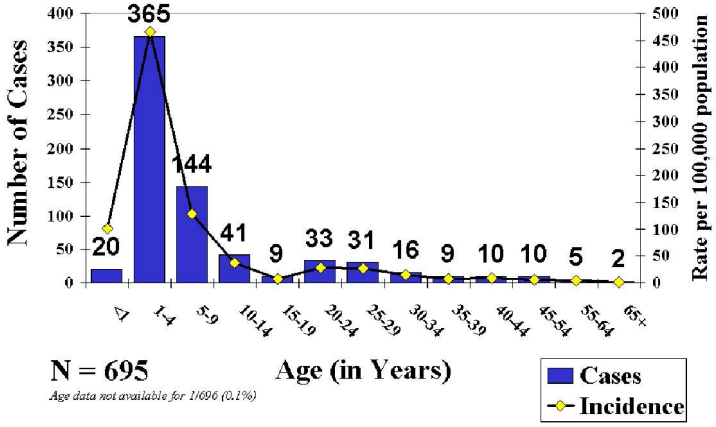
Shigellosis (*Shigella spp.)*

The PDPH received 696 reports of confirmed (n=554) and probable (n=142) cases of shigellosis in 2003. Serogroup data were available for 551 of the 554 cases; 547 (99.3%) were identified as *Shigella sonnei.* Cases ranged in age from <1 to 84 years; the mean age was 8.9 years, and the median was 4.0 years. Children under 9 years of age comprised 76% of all cases (Figure 11). The incidence of shigellosis in Philadelphia for the years 1993-2002 ranged from 5.7 to 22.8 per 100,000, with an average of 13.1 per 100,000 per year (Figure 12). The disease incidence in 2003 was 45.9 per 100,000, the highest incidence for *Shigella* infection in the past ten years, in large part related to an outbreak in daycare centers.

Of the 696 cases of shigellosis reported in 2003, 624 (89.7%) occurred between April 1st and September 30th; 299 (43.4%) were associated with 2 Philadelphia daycare centers (an attendee, employee, household member of an attendee, etc.). Two hundred nineteen of the daycare-associated cases (73.2%) were laboratory-confirmed; 78 (26.1%) had an epidemiologic link to a confirmed case and were classified as probable. The outbreak epidemic curve and PFGE analysis of the daycare-associated *Shigella* isolates suggest that the outbreak was not from a point source, but was likely due to transmission of infection from person-to-person.

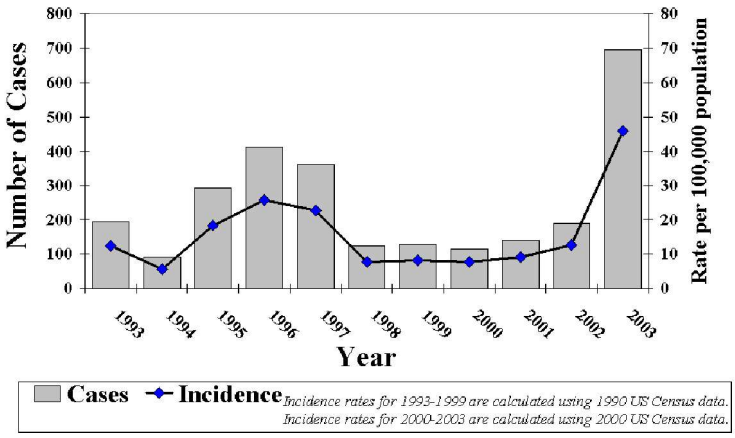
One-hundred-sixty-one confirmed and 70 probable daycare-associated cases came from 2 of the 12 daycare sites associated with the outbreak. Although children in daycare were driving the outbreak, there was also a significant community impact as demonstrated by overall disease rates. Outbreak transmission was interrupted by a combination of interventions, which included correction of environmental and infection control deficiencies at daycare sites, rapid identification and isolation or cohorting of confirmed and suspected shigellosis cases, prevention and control education at all Philadelphia daycare sites, and increasing herd immunity.

Figure 11. Probable and Confirmed Shigellosis, Cases and Incidence Rate by Age Group, Philadelphia 2003



Three hundred eighty *Shigella* isolates had antimicrobial susceptibility testing performed (Appendix 1). A comparison of Philadelphia isolates to national data on antimicrobial resistance patterns from the CDC (2001 data) shows comparable rates of ciprofloxacin, trimethoprim/sulfamethoxazole and ceftriaxone resistance but lower rates of ampicillin resistance in Philadelphia (64% v. 80%).

Figure 12. Probable and Confirmed Shigellosis, Philadelphia, Reported Cases and Incidence, 1993-2003



HEPATITIS INFECTIONS

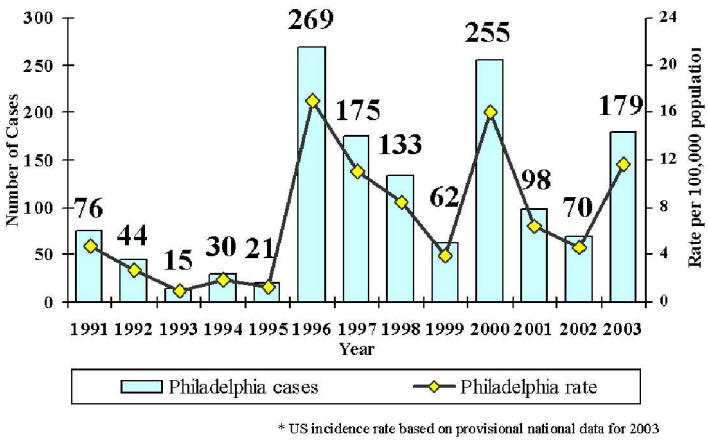
Hepatitis A

Two-hundred-seventy-two suspected cases of hepatitis A were reported to the Division of Disease Control in 2003. Of these, 179 were Philadelphia residents who met the Centers for Disease Control and Prevention (CDC) case definition for confirmed disease.

Cases ranged in age from 2 to 81 years, with a median age of 28 years (Figure 13), were primarily white (69%), male (58%), and heterosexual (62.0%). Twenty seven percent of cases lived within 2 of Philadelphia's 36 zip codes. Of the 179 cases, 158 (88%) were successfully contacted and interviewed. Of these, most reported jaundice (92.4%), 24% were known to have elevated liver enzymes, and 21% of cases had both. Only a small proportion of cases had any contact with a known case of hepatitis A (28/158).

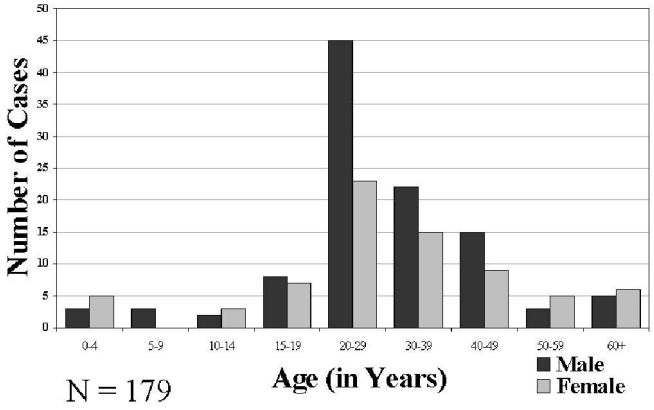
The most commonly reported risk factor was use of street drugs (46/158; 29%); heroin was the primary drug of choice (36/40; 90%). No drug users reported the use of methamphetamine. There were forty-five (28.5%) hospitalizations reported and no hepatitis A associated fatalities. The 179 cases identified in 2003 reflect more than a 2-fold increase in rate (11.7 per 100,000 population) when compared to 2002 (n=70, rate 4.6/100,000) (Figure 14).

Figure 14. Hepatitis A, Philadelphia 1991-2003 Cases and Rates



* US incidence rate based on provisional national data for 2003

Figure 13. Hepatitis A, Philadelphia 2003 Age and Sex Distribution of Cases



A retrospective look at routine surveillance data shows that the rate increase began in late 2002 and these cases were geographically clustered in 2 contiguous zip codes. Demographically, these cases were no different than the cases overall. A large proportion of them were intravenous drug (heroin) users but no common exposures or links between the heroin users were identified.

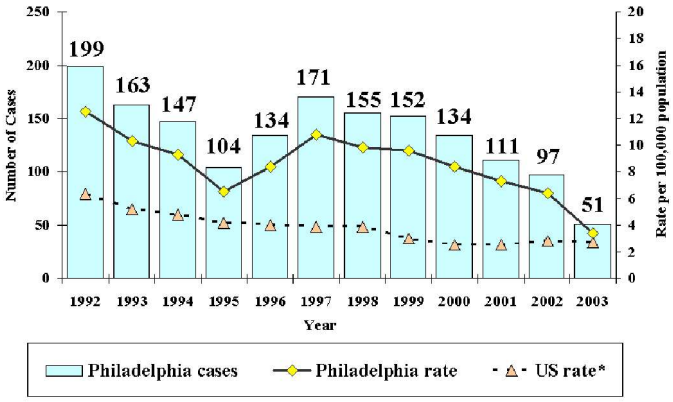
In response to this increase, the PDPH and a hospital in one of the affected zip codes with a large drug detoxification and rehabilitation program developed and instituted a hepatitis A immunization program for detox admissions and methadone clinic patients. The impact of the hepatitis A immunization program on disease incidence is presently unknown.

Hepatitis B

DDC received 1,295 reports of patients with a positive hepatitis B serology in 2003. Fifty one (4%) were confirmed cases having acute disease. The CDC case definition for acute hepatitis B requires the presence of: a) discrete onset of symptoms, b) jaundice or elevated serum aminotransferase levels, and c) IgM antibody to hepatitis B core or positive hepatitis B surface antigen to define the case as acute.

The overall acute hepatitis B case rate (based on 2000 population census data) for Philadelphia was 3.4/100,000 in 2003. The provisional 2003 acute hepatitis B rate for the United States was 2.7/100,000. As shown in Figure 15, this represents a large decline in Hepatitis B for Philadelphia and brings us much closer to the U.S. rate. Cases ranged in age from 13-86 years (mean 38.7, median 37 years); 78% were between the ages of 20 and 49. Most (45/51; 88%) reported only heterosexual contact. Common reported risk exposures during the 6 months prior to illness included: drug use (14%), dental visit (6%), and two or more sexual partners (18%). No cases reported a history of receiving the hepatitis B vaccine. Of the 51 cases, 22 (43.1%) were hospitalized, and there were no hepatitis B-associated fatalities.

Figure 15. Hepatitis B, Philadelphia 1992-2003 Cases and Rates*



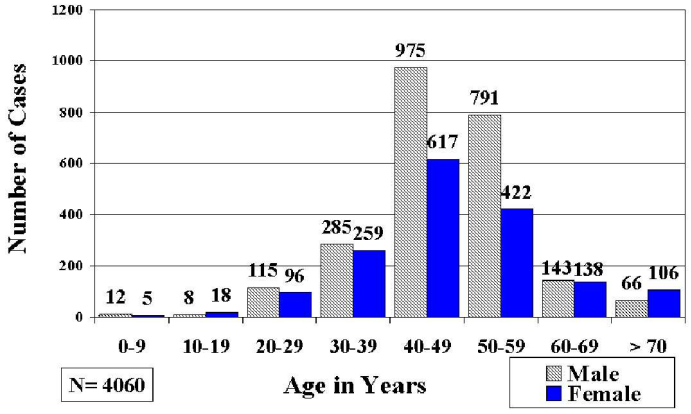
** 2003 US incidence rate based on provisional national data*

Hepatitis C

In 2003, the CDC added chronic hepatitis C infection to the list of nationally notifiable infectious diseases. Now designated as 'hepatitis C Infection, past or present', clinical laboratories are required to report patients with serologic evidence of hepatitis C virus (HCV)infection, regardless of whether infection is acute or chronic. DDC does not investigate every report of a positive HCV serology to determine whether the infection represents an acute case. Therefore, DDC requires health care providers to report all persons suspected of having acute HCV. In 2003, 3 cases of acute HCV were reported and investigated. This is an under-representation of true acute HCV incidence in Philadelphia. DDC has established 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 since January 1998 who have evidence of HCV infection, 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 collected; therefore, DDC is unable to assure that all reported morbidity indicates true HCV infection. However, 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 2003, DDC added 4,060 unique new patients to the HCV registry. This number increased nearly fourfold compared to prior years, probably due to implementation of Electronic Laboratory Reporting of HCV test results from major reference labs (Quest, LabCorp). The age and sex distribution of persons newly added to the HCV registry in 2003 are shown in Figure 16. (Please note that not all cases are reflected in graph due to missing age data.) Of the 4,060 new HCV registry entries, 1,099 cases met the CDC case definition for confirmed Hepatitis C infection, past or present, based on supplementary testing or accompanying clinical information. The remaining 2,961 persons are unconfirmed cases, but likely represent true morbidity.

Figure 16. Hepatitis C, Philadelphia 2003 Age and Sex Distribution of Newly Reported Cases with Positive Hepatitis C Serologic Tests

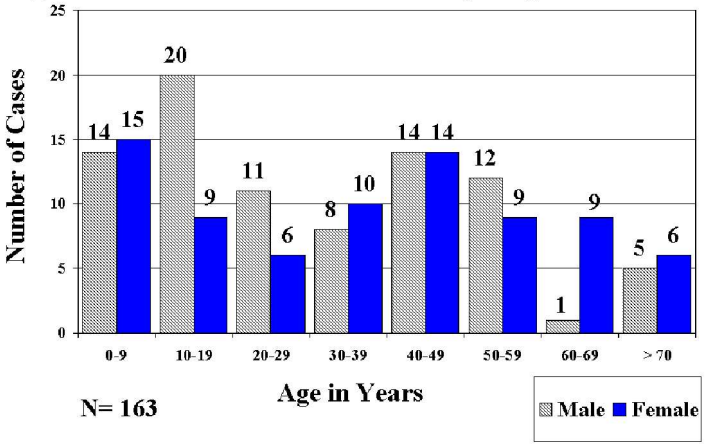


VECTOR-BORNE DISEASES

Lyme Disease (*Borrelia burgdorferi*)

In 2003, 163 persons were confirmed as new cases of Lyme disease, a decrease of 10% compared to the 182 cases recognized in 2002. Although clinical laboratories reported positive serologic studies (enzyme immunoassay, Western blot, immunoblot, etc.) for 572 unique patients, 409 (72%) did not meet the criteria for the CDC case definition for Lyme disease. CDC-defined confirmation of Lyme disease requires that a case have either (a) physician-diagnosed erythema migrans or (b) at least 1 late manifestation of disease with positive laboratory criteria for disease. The reasons that persons with lab-reported morbidity in Philadelphia could not be established as Lyme cases were as follows: 69 (17%) persons resided out of surveillance jurisdiction; 85 (21%) persons did not meet clinical criteria for Lyme; and 255 (62%) had no clinical information obtained from provider. Age and sex distribution of cases are shown in Figure 17.

Figure 17. Lyme Disease, Philadelphia 2003
Age and Sex Distribution of Newly Reported Cases



One hundred thirty-nine of the 163 confirmed cases provided information about suspected location of exposure to ticks, 92% reported being exposed in PA. Of the 110 cases who reported county of exposure, 82% reported exposure in Philadelphia. Presenting clinical manifestations (non-exclusive) for Lyme disease among confirmed cases were: erythema migrans (62%); arthritis (39%); Bells palsy (11%); lymphocytic meningitis/encephalitis (2%); carditis (1%); and radiculopathy (1%).

West Nile Virus

In 2003, West Nile Virus (WNV) activity was documented across 46 states and the District of Columbia, encompassing 9,858 human WNV cases (median age = 47) and 264 deaths (median age=78 yrs). The 2003 transmission season surpassed the previous season as being the largest arboviral outbreak ever recorded in the United States.

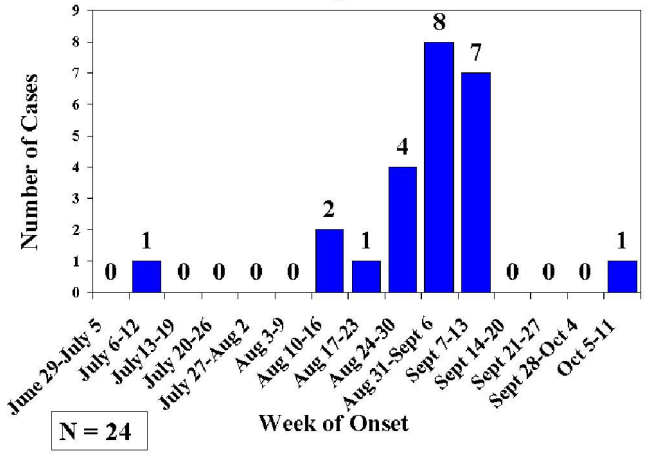
This season, the CDC formally collected data on a milder form of WNV Infection termed 'West Nile Virus Fever (WNVF)'. WNVF is laboratory confirmed WNV infection in the absence of meningoencephalitis. Similar to national disease activity, Philadelphia also witnessed an increase in WNV activity in 2003 with 24 residents identified as infected with WNV. There was no geographic clustering of cases. One infection (female, age 79) was fatal.

Twenty-two cases were confirmed as having WNV-meningoencephalitis (WNVME), including the 1 fatality. Two cases were confirmed as having WNVF alone. The age range for the Philadelphia WNV cases was 32 years to 89 years of age, median age 63.

Eighteen of 24 (75%) were female and 6 of 25 (25%) were male. In the Commonwealth of Pennsylvania in 2003, there were 237 confirmed WNV infections, including 8 deaths. This represents a near fourfold increase from 62 cases reported in the Commonwealth for the previous season. A total of 107 specimens from Philadelphia residents (37 CSF only, 36 serum only, and 34 CSF and serum) were submitted for West Nile Virus testing, of which 24 (22%) were positive. By contrast, in 2002, 95 clinical specimens were tested in 2002, with 6 (6%) confirmed positive. The onset date of the first

reported Philadelphia case was on July 9th, 2003. The onset date of last reported case was Oct. 2nd. Peak transmission occurred between Aug. 24th and Sept. 13th (Figure 18).

Figure 18. West Nile Virus, Philadelphia, 2003
Number of Cases by Week of Onset*



*Week of Onset: Hospitalization date or lab date used if onset date unknown

The vast majority of WNV infections are caused by mosquito vector transmission from viremic birds. The PDPH Division of Environmental Health Services (EHS) in conjunction with the Pennsylvania Department of Environmental Protection (DEP) maintains an aggressive mosquito control program to decrease the presence of the vector. As of July 1, 2003, all blood collection agencies in the country began screening donated blood for WNV. Any blood that tests positive for WNV is discarded prior to distribution.

In Philadelphia, 1 case of WNVF was identified in a donor who was asymptomatic at the time of donation. The donated blood from this patient was discarded. The DDC is available to coordinate and assist providers in ordering the appropriate tests to evaluate persons suspected of having WNV Infection.

Malaria (*Plasmodium spp.*)

In 2003, 19 Philadelphians were diagnosed with malaria based on microscopic examination of a peripheral blood smear. Etiology by species was *P. falciparum* (9), *P. malariae* (3), *P. vivax* (4), and unable to speciate (3). The median age of cases was 29 years (range 7-53 years), and males were disproportionately affected (n=14). Ten cases were hospitalized for 24 hours or more.

Eighteen cases were located for disease investigation and treated successfully for malaria with appropriate agents. One case was unable to be located for disease investigation. Of the 18 who were investigated, malaria by presumed region or country of acquisition and species is shown in Figure 19.

Only 4 of the 18 cases had taken malaria prophylaxis while in the foreign country. Two of these were infected with *P. falciparum,* 1 with *P. malariae,* and 1 with *P. vivax.* Cases who had not taken malaria prophylaxis usually were either recent immigrants or were returning to a region from which they had previously emigrated.

Figure 19. Malaria, Philadelphia 2003
Number of Cases by Species and Country of Acquisition

	P. falciparum	*P. malariae*	*P. vivax*	Unspeciated
Africa, Western	6	3	1	3
Africa, other	1		1	
Asia	1			
Central or South America			2	
Unknown	1			
Total:	**9**	**3**	**4**	**3**

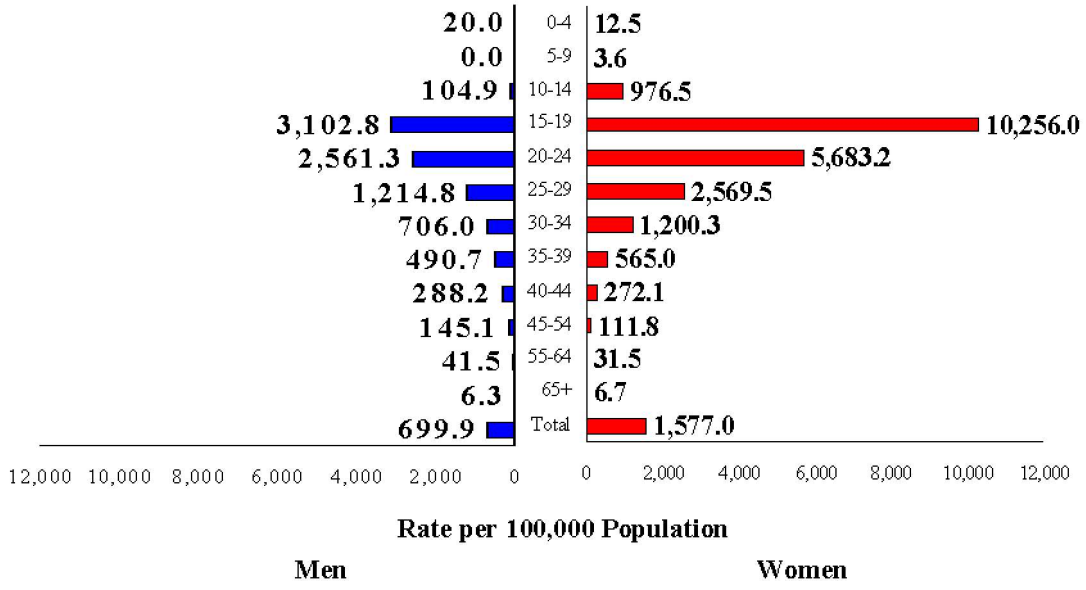
SEXUALLY TRANSMITTED DISEASES

Chlamydia trachomatis

Chlamydia is among the most frequently reported infectious disease in the United States. Although more than 835,000 cases were reported in the US in 2002, an estimated 3 million cases occur annually. In Philadelphia, 17,747 cases of *Chlamydia trachomatis* were reported in calendar year (CY) 2003, representing an increase of 16.5%(+2,513 cases) when compared to 2002. Annual reported *Chlamydia* morbidity has 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).

Rates of reported *Chlamydia* infections in women are consistently much higher than in men (Figure 20). In 2003, the rate among women 15-19 years old was 10,256 per 100,000 compared to men at 3,102.8. The highest rates among males and females were in this age group. In CY 2003, there were a disproportionate number of females reported resulting in a F/M ratio of 2.25:1; however, this is down from a F/M ratio of 3.9:1 in 2001and 2.4:1 in 2002. Overall, the number of male cases of *Chlamydia* identified in 2003 increased 126.1% (+2,752 cases) compared to 1999, due primarily to increased screening among asymptomatic males. 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. Much of the increase in testing and reporting in men is due to an enhanced effort by the PDPH to screen asymptomatic adolescent males. 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.

Figure 20. Rate of Chlamydia per 100,000 Population by Age and Gender: Philadelphia, 2003.



These screening efforts found a *Chlamydia* infection rate of 5.5% (267/4,812) among asymptomatic males and 17.4% (123/708) among females in 2003. Screening efforts expanded during 2001 and 2002 to include District Health Care Center clinics, Adult Prisons and Health Resource Centers in selected high schools. In 2003, a citywide screening program including all Public High Schools was also implemented. This program alone tested 21,000 students and identified 1,161 cases of *Chlamydia* (302 cases among males; 859 cases among females). In 2003, a total of 153,324 tests for chlamydia were performed through the citywide screening program with 10,541 (6.9%) positives identified; these results are comparable to 2002 when 108,893 tests were performed with 8,246 (7.6%) positives identified.

Gonorrhea (*Neisseria gonorrhoeae*)

In 2003, there were 5,731 cases of gonorrhea reported in Philadelphia. This is a 21.2% decrease [-1,546 cases] from 2002. This was the third annual decrease in reported cases of gonorrhea. Teenagers and young adults remain disproportionately affected with 58.7% (3,366/5,731) of the cases 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. The dramatic increase in the number of males tested was due to enhanced screening efforts using 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 2003, the PDPH provided or supported 99,680 screening tests for gonorrhea among females resulting in the identification of 1,679 (1.7%) infected women; this accounted for more than 55%(1,679/3,038) of the total cases of gonorrhea reported in women. As with chlamydia, women with untreated gonorrhea are at risk of developing complications including Pelvic Inflammatory Disease 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 favorable impact on this disease.

Early Syphilis (*Treponema pallidum*)

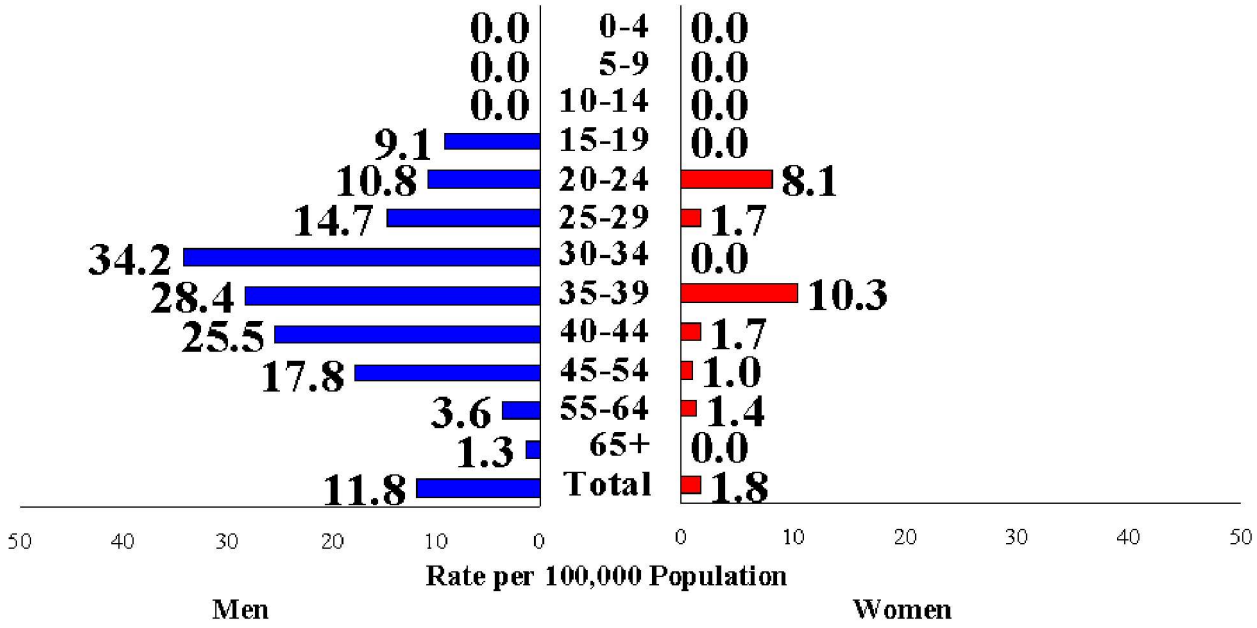
Reported primary and secondary (P&S) syphilis morbidity in 2003 increased 38.0%, from 71 to 98 cases, when compared to 2002. Since 1990, the peak year of our most recent syphilis epidemic, there has been a 96% overall decrease in reported P&S syphilis from the 2,361 cases reported in that year. This 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 95.0% (-3,713 cases) since the peak of the epidemic in 1990 when 3,907 cases were reported. In 2003, 194 cases were reported; this represents a decrease of 12.2% (-27 cases) when compared to 2002. Reported rates of P&S and early latent syphilis were higher among men than women in 2003 (Figure 21).

The cause may be multifactorial, including an increase in the percent of male cases attributable to men who have sex with men, from 0.9% in 1995 to 56.8% (46/81) in 2003, 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.

With rates of infectious syphilis at an all time low in the United States, the Centers for Disease Control and Prevention 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.

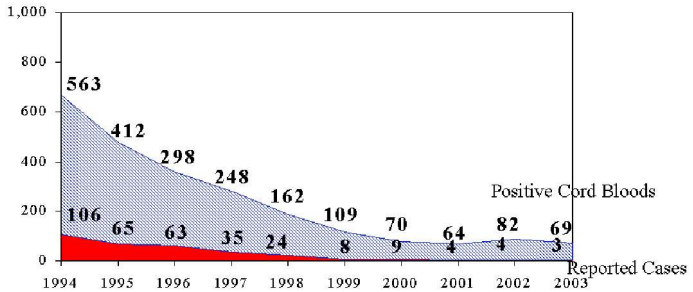
Figure 21. Rate of Primary & Secondary Syphilis per 100,000 Population by Age and Gender:Philadelphia, 2003.



Congenital Syphilis

In 2003, 3 cases of syphilis in Philadelphia newborns met the current Centers for Disease Control and Prevention surveillance definition for congenital syphilis; four cases were reported in 2002. This represents a 99.0% (-298 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 22). This number decreased from 82 in 2002 to 69 (-15.9%) in 2003. Since 1992, we have seen an overall 92.0% (-795 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 22. Reported Congenital Syphilis Cases and Number of Positive Cord Blood Tests: Philadelphia, 1994-2003.



VACCINE-PREVENTABLE DISEASES

Measles (Rubeola)

Twelve suspected measles cases were reported to DDC in 2003; all 12 were ruled out based on a negative serologic test (IgM) and/or a clinical case presentation that was incompatible with measles. In 3 of the 12 cases, alternate diagnoses were established, including scarletina and viral exanthem. Two persons were reported with positive measles serologic tests that were done solely for screening of immunity.

Nationally, there were a total of 57 confirmed cases of measles in 2003; 81% were imported from a foreign country. Prompted by a local outbreak of measles (N=6) among foreign born and/or inadequately immunized students of a Southeast Pennsylvania Boarding School, DDC provided MMR vaccine and education to staff of the Philadelphia Immigration and Naturalization Service (INS) after exposure to 1 of the measles cases. No secondary cases of measles occurred among INS staff.

Additionally, there were several US measles outbreaks linked to children adopted from Chinese orphanages. The lesson learned was that immunization records for children adopted from orphanages are often inaccurate. Prospective parents need to update their own immunizations, in addition to having the adoptee vaccinated according to US standards of care.

Mumps

Eight suspected mumps cases were reported to DDC in 2003. Of these, none were confirmed according to CDC case definitions. Two individuals were designated as probable cases based on clinical manifestations: 1 male aged 15 years and 1 female aged 88 years. However, since other viral illnesses, such as coxsackie virus and parainfluenza, may also present with parotitis, a diagnosis of mumps can only be confirmed by viral culture of urine or nasopharyngeal aspirate, or by positive serologic tests (IgM).

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 2003, there were 8 acute rubella cases reported in the US, and no infant born with congenital rubella syndrome. No cases occurred in Philadelphia.

Pertussis (*Bordetella pertussis*)

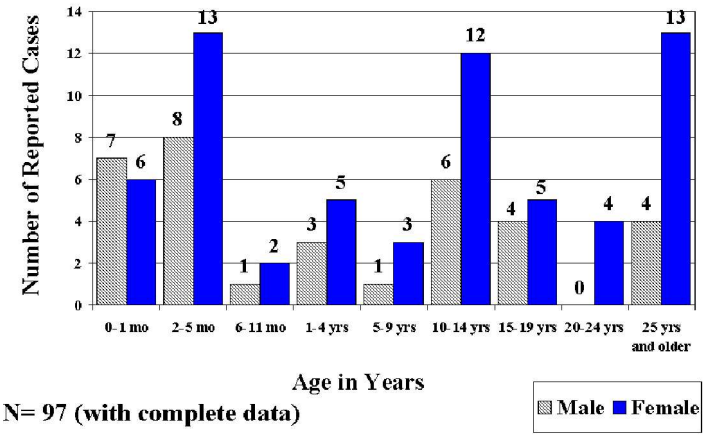
In 2003, 98 reported cases of pertussis in Philadelphia met the CDC surveillance definition. Of these, 85 were considered confirmed because the cases had positive laboratory tests (PCR = 35, culture =11) or because the cases were epidemiologically linked to a laboratory-confirmed case (n = 39). Thirteen persons were considered probable cases because they met the CDC clinical case definition, but no laboratory testing or epidemiologic link could be established. The 2003 pertussis incidence per 100,000 persons for Philadelphia was 6.5 and for the United States was 4.0.

Thirty-four (35%) of the Philadelphia cases were less than six months of age. Typical for pertussis infections, the preponderance of cases occurred in females (66%). Complete age and sex distribution cases is shown in Figure 23. Transmission of pertussis from an adult source (18 years or older) to an infant was documented in only 3 instances.

Of the 34 children less than six months of age, 10 (29%) had received 1 dose of pertussis containing vaccine (PCV), 2 had 2 doses, only 1 had 3 doses, and 21 (62%) had not received any

doses of pertussis-containing vaccine (PCV). Of the 3 children in the 6-month to 1 year age group, 2 had had one dose of PCV and the other had 2 doses. Of the 8 children in the 1 to 4 year old age group only 3 had had 4 doses of pertussis-containing vaccine. Of the five children in the 5 to 9 year age group, 4 had received 5 doses of pertussis-containing vaccine and 1 was not documented. The majority (70%) of the adolescent group 10 through 19 years (n=27) had 5 or 6 doses of pertussis-containing vaccine, while 2 (7%) had 1 dose, 1 (4%) had 3 doses and 2 (7%) had no documentation. None of the adults were able to document their vaccination history. Thirty-five (36%) of the pertussis cases required hospitalization; the hospitalization duration ranged from 1 to 13 days (mean = 4.3 days). There was 1 death in a 6-year-old who was co-infected with influenza. Symptoms consisted of cough in 100% of cases, paroxysmal in 59% of cases, with duration of cough ranging from 7 to 85 days (median = 35 days). Other reported symptoms

Figure 23. Pertussis, Philadelphia 2003
Age and Sex Distribution of cases



N= 97 (with complete data)

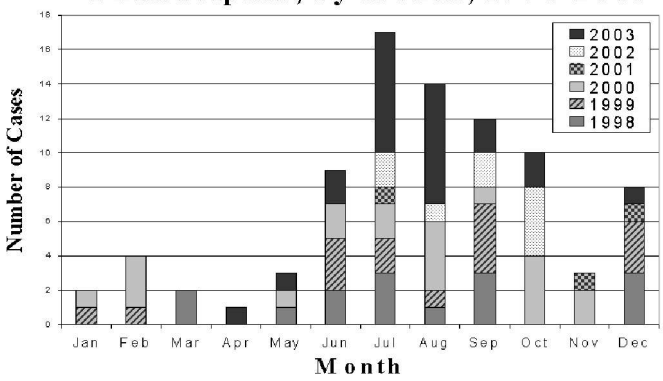
included whoop (38% of cases), apnea (41%), and post-tussive vomiting (51%). Ninety-nine percent were prescribed antibiotics. Of these, 42% received erythromycin, 15% received azithromycin and 8% received clarithromycin, but 18% were given antibiotics that are not active against *B. pertussis.*

OTHER REPORTABLE DISEASES AND CONDITIONS

Legionellosis (*Legionella pneumophila*)

Twenty-three cases met the CDC case definition for Legionnaires' disease in 2003. Urine antigen was used to establish the diagnosis in 22 of the cases; detection of Legionella species in bronchial secretion was the method of diagnosis for the other case. All cases presented with a clinical syndrome of pneumonia. There was one fatality (49 year old male, past medical history significant for immune suppression, acute renal failure). A predisposing medical condition was reported among 83% of the cases. Of these, nonexclusive risk factors include: 56% smokers, 26% diabetes, 13% having had cancer, 4% immune suppressed, and 4% renal disease. Median age of cases was 55 years (range 30-83 years). A seasonal increase in *Legionella* infections was noted during the summer months. This seasonal increase was also noted among several other southeastern Pennsylvania counties and among surrounding Mid and South-Atlantic states, including Delaware, Maryland, the District of Columbia, North Carolina, and Virginia. Collaborative investigation involving national, state and local health officials found no common source exposure; however, rainfall and warm temperatures were correlated with increased disease incidence. Locally, a cluster of 3 legionellosis cases was investigated in 2003 for possible nosocomial source. Two cases occurred in persons hospitalized for acute medical problems, and 1 occurred in a worker at the same hospital. Seventeen (74%) cases were reported during the months from June - August 2003, which was higher than the average number of cases reported during the summer months in recent years. (Figure 24).

Figure 24: Legionellosis Cases, Philadelphia, by month, 1998-2003



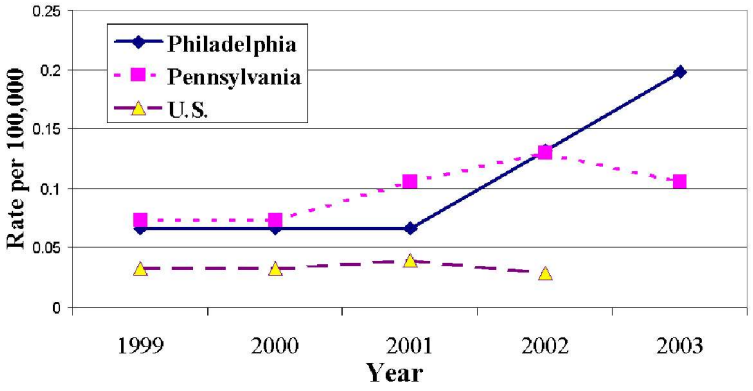
Because the epidemiology suggested a nosocomial source, extensive environmental investigation was undertaken by the facility, including water sample cultures for *Legionella.* Although several water samples were positive for *Legionella* species, analysis of strains from clinical cases and environmental samples by pulsed field gel electrophoresis (PFGE) found them to be unrelated. Health care providers are reminded to promptly report all cases of legionellosis to the Division of Disease Control. For suspected nosocomial outbreaks, DDC can provide assistance with investigation and analysis of clinical and environmental isolates of *Legionella* by PFGE.

Infant Botulism (*Clostridium botulinum* toxin)

In 2003, 3 cases met the CDC clinical and laboratory criteria for infant botulism. All 3 are believed to be sporadic occurrence of disease with no common source of exposure. In 1 case, the parent reported extensive yardwork/gardening performed after the birth of the child but no risk factors were identified for the others. The median age of cases was 6 weeks (range 3-9 weeks). Medical treatment consisted of intensive care support and mechanically assisted ventilation. Botulism immune globulin was administered within 48 hours of diagnosis, with eventual full recovery of the 3 infants. Isolation of *Clostridium botulinum*toxin type B in stool through mouse neutralization assay was the method of detection in all cases. Among the 4 botulism toxin types

that cause disease in humans (A, B, E, F), type B is the most common species detected in this region. In general, the distribution of cases by toxin type has paralleled the distribution of toxin types in U.S. soil, with type B predominating from the Great Plains eastward and type A cases predominating from the Rocky Mountains westward. Southeastern Pennsylvania is often described as being in the 'botulism belt.' Rates of botulism in this region of the country can be expected to exceed other areas (Figure 25). Physicians are reminded that botulism is a reportable disease. The DDC can provide assistance in the diagnosis and management of suspected cases of infant botulism.

Figure 25. Infant Botulism Rates, Philadelphia and the U.S., 1999-2003



SARS (Severe Acute Respiratory Syndrome)

On March 12, 2003, the World Health Organization (WHO) issued a global alert describing a newly emerging infectious respiratory disease that was affecting people in the southern provinces of China. This illness became known as Severe Acute Respiratory Syndrome (SARS). Due to the ease of global travel, SARS quickly spread to 30 countries, infected greater than 8000 people,and was responsible for nearly 800 deaths. A novel coronavirus (SARS-CoV) was quickly identified as the etiologic agent that causes SARS. The incubation period for SARS is 2 to 10 days, with the median time from exposure to onset of symptoms being 4 to 6 days.
SARS-CoV is a respiratory virus that is primarily spread via droplet transmission, although there is also evidence to suggest airborne transmission. Since laboratory testing for SARS-CoV is still being validated and is not rapid (often taking several weeks for results), the initial diagnosis of SARS is based on epidemiology and clinical manifestations of illness.
Although the SARS surveillance definition has since changed, the CDC's working definition in 2003 was as follows:

Suspect Case: Temperature > 100.4 F AND cough or shortness of breath AND Travel to a SARS affected area within 10 days prior to illness onset or contact with someone who traveled there and is ill with similar symptoms.

Probable Case: Same as above but also has an abnormal Chest X-ray.

Laboratory Confirmed: Any case that has a positive laboratory test for SARS - CoV.

In Philadelphia there were no cases of SARS. Three individuals who initially met the suspect case definition were subsequently ruled out for SARS by having negative SARS-CoV serology. In Pennsylvania, 5 individuals met the suspect case definition. One individual, a traveler returning from Toronto, was laboratory confirmed for SARS-CoV. Diagnostic testing for SARS-CoV can be performed on a variety of clinical specimens, including respiratory specimens, sera, and stool.

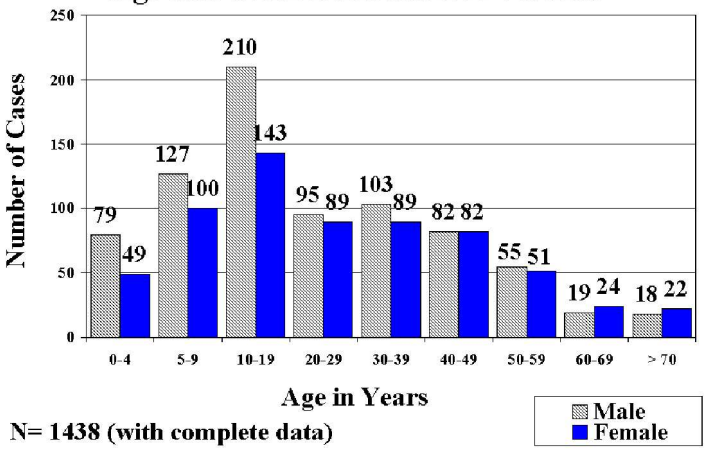
The DDC will facilitate transportation of clinical specimens to the Pennsylvania Department of Health Bureau of Laboratories location where SARS-CoV testing is done. Although there were no cases of SARS in Philadelphia, DDC responded to this newly emerging infectious disease on a variety of levels. SARS was added to Philadelphia's List of Reportable Diseases and Conditions. DDC reviewed and modified existing policies and protocols for rapid evaluation and triage of persons presenting with an unknown respiratory illness. Numerous trainings and in-services were provided to a variety of agencies and organizations within the city, including airport employees, fire rescue personnel, university student health staff and community based clinic staff.

Animal Exposures

In 2003, PDPH received reports of 1,612 animal exposures, a 19% decrease when compared to reported human exposures to animals in 2002. Reportable animal exposures include occurrence of any event where a human may potentially have been exposed to the rabies virus. In 2003, reported exposure types included bites (96.5%), scratches (3.2%), saliva contact (0.25%), and other (0.06%). An owner of the biting animal was identified for 62% of incidents. Ninety-seven percent of reported bites were inflicted by domestic animals (cats, dogs, ferrets, goat, guinea pig, hamsters, rabbits), with dogs accounting for 75% of all reported exposures. In 314 instances (21.5 % of bite incidents), it is known that victims were bitten by their own pets. Of bites inflicted by animals other than dogs or cats, frequently reported exposures from other animals included: mice (13), rats (9), squirrels (8), bats (8), hamsters (5), and rabbits (5). Age of the bite victim was available in 1441 of the 1612 incidents. Median age was 20 years. Nearly half of reported cases for which we have age data involved individuals 19 years of age or younger (Figure 26).

In 2003, the Philadelphia Public Health Laboratory tested 63 animals for rabies by direct fluorescent antibody staining of brain tissue. The animals tested included: cats (32); dogs (14); bats (11); raccoons (2); ferret (1); fox (1); groundhog (1); and pig (1). One fox and 1 bat tested positive for rabies antigen. There was no reported human exposure to the rabid fox. The bat was reported by a Philadelphia resident who confirmed contact with the animal. The resident received rabies post exposure prophylaxis.

Figure 26. Animal Exposures, Philadelphia 2003
Age and Sex Distribution of Victims



N= 1438 (with complete data)

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

SPECIAL PROJECTS

STD SCREENING IN PHILADELPHIA PUBLIC HIGH SCHOOLS

Reported morbidity for *Chlamydia trachomatis* in Philadelphia continues to increase, especially among adolescents. In 2003 the rate of *Chlamydia* infection in women ages 15-19 years was 10,256 per 100,000 population. Reported rates in young men were much lower but continued to increase (3102 in 2003 vs 2246 in 2002). Lower rates among adolescent males may be attributed to a number of factors including a lack 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, the PDPH initiated a pilot program to offer confidential chlamydia and gonorrhea testing in Philadelphia public high schools.

Urine-based testing of adolescents in 2 Philadelphia high schools began on October 1, 2001 and November 1, 2001, respectively. The schools were selected because of the high rates of chlamydia in the zip codes where the schools are located and the fact that these schools supported Health Resource Centers (HRC) - a room in each school staffed by a counselor who provides family planning and disease prevention counseling and referral services, plus condoms. Staff in the HRCs were augmented and services expanded to include urine-based screening. In addition, classroom presentations were used to stimulate student participation and to educate them about the risks of unprotected sex.

Through the end of the 2001-2002 school year, 1219 students were tested. Of the 683 girls tested, 16.1% (110/683) were found to be infected with chlamydia (87), gonorrhea (10), or both STDs (13). Of the 536 boys tested, 5.2% (28/536) were infected with chlamydia (26) or both chlamydia and gonorrhea (2). Treatment was confirmed for all who tested positive.

Evidence of high rates of chlamydia and the acceptability and feasibility of offering testing in High Schools was effectively demonstrated in the pilot program described above. The Department of Public Health and the School District collaborated to initiate a citywide voluntary screening effort including all public high schools in January 2003.

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 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 chlamydia (284), gonorrhea (10) or both STDs (8). Of those who tested positive, 99.8% (1159/1161) were treated.

During the 2002-2003 academic year, STD screening continued in the 2 HRC schools where it was initially piloted and, in addition, 3 other schools with HRCs were added. During the 2003 calendar year, these 5 schools screened 2,737 students. Of the 1,422 females tested, 12.8% (182/1,422) were found to be infected with chlamydia (155), gonorrhea (11) or both (16) STDs. Of the 1,315 male students tested, 4.9% (65/1,315) were found to be positive for chlamydia (53), gonorrhea (6) or both (6). Of those who tested positive, 96% (237/247) were treated.

The 2 screening programs combined identified more that 1,400 students infected with chlamydia, gonorrhea or both STDs. The treatment of these students prevented hundreds of cases of pelvic inflammatory disease and prevented the transmission of these infections to hundreds more. The STD Control Program continues to search for new venues and innovative programs to reach adolescents, who are disproportionately affected by these diseases.

VARICELLA ACTIVE SURVEILLANCE PROJECT

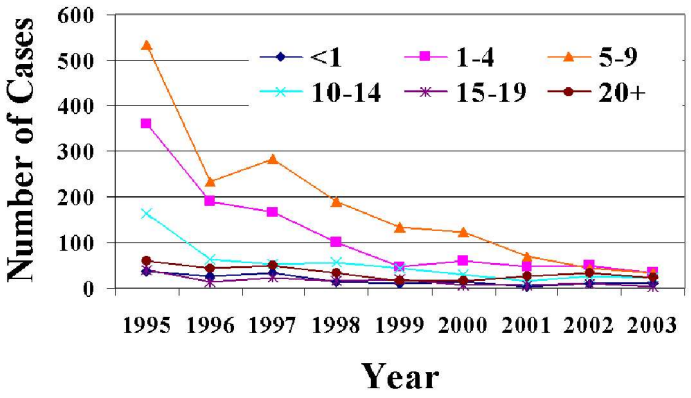
The Philadelphia Department of Public Health's Varicella Active Surveillance Project (VASP) completed its 9th year monitoring the occurrence and epidemiology of varicella in the target area of West Philadelphia during 2003. VASP has continued to work with community-based sites to conduct active disease 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 2003, a total of 130 confirmed cases of varicella were reported from the VASP surveillance area of West Philadelphia, slightly less than year 2002 (170) and the lowest number of reported cases since 1995 (1197), the first full year of active varicella surveillance (Attachment 1). Since 1995, varicella vaccine coverage rates for Philadelphia among children 19 to 35 months have increased from 43% in 1997, to 89% for the second half of 2002 through the first half of 2003 according to the National Immunization Survey. Primary care facilities/physicians were the greatest source of varicella case reports received by the DDC, accounting for 27.7% of all reported cases during the year. Schools reported 19.2% of the varicella cases, while emergency room departments/hospitals reported 18.5% of the cases. In 2003, the number of cases by age group remained dramatically lower than 1995 when varicella vaccine was licensed for use in the United States (Figure 27).

Over half of the 2003 cases (52.3%) were 1 to 9 years; however, over 80% 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 2003: Kindergarten through third grade and sixth through eighth grades. Two of the confirmed varicella cases for 2003 from West Philadelphia were hospitalized, decreasing from 6 hospitalizations in 2002. No varicella-related deaths in Philadelphia residents were reported to VASP in 2003. Only 1 varicella-related death from West Philadelphia has occurred during the project period (1995-2003), while 6 have occurred outside of the target area, since the start of the project.

Figure 27. West Philadelphia Varicella Cases by Age Group, 1995 through 2003*



*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.

Herpes Zoster Surveillance

Thirty-eight confirmed zoster cases in individuals <20 years of age from West Philadelphia were reported to VASP in 2003. Private physicians reported the majority of the zoster cases (12 cases, 31.6%). Ages of the zoster cases ranged from 1 to 19 years with a median age of 15.5 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 38 zoster cases from year 2003, 29 (76.3%) reported a history of varicella; 6 (15.8%) reported varicella vaccination; 2 (5.3%) had a history of disease and also were vaccinated; and 1 (2.6%) had an unknown disease history and did not receive the varicella vaccine. None of the 2003 West Philadelphia zoster cases <20 years of age were hospitalized.

Antenatal Varicella Susceptibility Study

From December 2001 through May 2003, VASP in collaboration with CDC conducted a study to assess varicella susceptibility among women of childbearing age at 6 prenatal clinics in Philadelphia. A total of 804 women were enrolled in the Antenatal Varicella Susceptibility Study, completed the study questionnaire, and gave a serologic specimen for VZV IgG antibody testing. The number of participants enrolled by study site location ranged from 46 to 309 women.

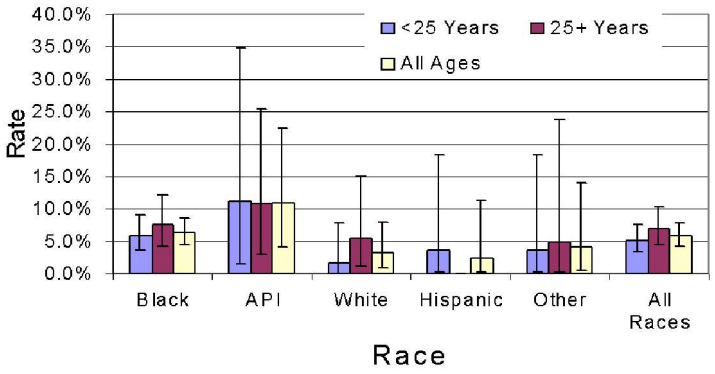
Ages of the women enrolled in the Antenatal Varicella Susceptibility Study ranged from 13 years to 47 years with a median age of 23 years. The majority of the participants were African American (65.7%), while 15.6% were White, 6.8% were Asian/Pacific Islander (API), 5.9% were Hispanic, and 6.1% represented other racial background. VZV IgG antibody test results were positive, indicating varicella immunity, for 757 of the 804 participants (94.0%), while 47 (5.8%) were susceptible with negative or equivocal VZV IgG antibody results. Figure 28 displays varicella susceptibility rates by race and age group.

All study participants and prenatal clinic providers were notified of the serologic results through letters from VASP. The susceptible women also were contacted by telephone and provided with information on the potential dangers of VZV exposure during pregnancy and the importance of receiving 2 doses of varicella vaccine following delivery. VASP was able to contact 43 of the 47 (91.5%) susceptible participants before delivery or miscarriage.Thirty-two of the 47 susceptible participants received both doses of varicella vaccine, while another 7 women received the first dose only including 2 women who have relocated from the Philadelphia area.

Breakthrough Varicella Study

In October 2001, VASP and CDC implemented a study to determine the proportion of suspected breakthrough varicella reports that are true varicella infections according to VZV specific laboratory testing.

Figure 28. Antenatal Varicella Susceptibility Rates and 95% Confidence Intervals by Race and Age Group



Detailed clinical and epidemiologic data was collected during the investigation of suspected breakthrough cases using the VASP varicella case investigation form. Lesion and serologic specimens were collected by healthcare providers during visits or VASP staff when available at the time of rash illness. Attempts were made to obtain convalescent serologic specimens at least 4 weeks after rash onset for those reports with acute serologic specimens obtained.

From October 2001 through December 2003, VASP received 275 suspected breakthrough varicella case reports that were investigated with VZV specific laboratory testing performed. Of the 275 reports, 81 (29.5%) were individuals from the West Philadelphia surveillance area. The breakthrough reports ranged in age from 1 to 20 years with a median age of 6 years. The proportion of males was slightly higher than females (57.1% vs. 42.9%). Over one-half of the breakthrough reports were African American/Black (58.2%) and 28.7% were White, while 10.9% of the suspected cases were Hispanic. Time from receipt of vaccine to varicella rash onset ranged from 48 to 3039 days (8.3 years).

Seven breakthrough reports received vaccine 1 to 89 days before their first birthday, while the remaining reports were 1 to 16 years of age when vaccinated with the first dose of varicella vaccine. Two suspected breakthrough case were 13 years of age or older at time of vaccination received 2 doses of varicella vaccine. Additionally, second doses of varicella vaccine were given to 2 breakthrough reports who were under 13 years of age.

Results were positive or equivocal for 31 of the 219 (14.2%) suspected cases having the VZV-specific IgM testing performed. The median time of collection from rash onset was significantly different (p value < 0.001) for those with positive/equivocal IgM results (5.0 days) as compared to those with negative results (2.0 days). An acute to convalescent VZV IgG titer rise was seen in 27 of the 59 (45.8%) reports with specimens collected at both time points and having both tests completed on the same VZV IgG ELISA assay. Of the 238 reports with lesion specimens collected for PCR testing, 70 (29.4%) cases were positive for wildtype VZV, 97 (40.8%) were negative for VZV, and 71 (29.8%) cases had specimens that were inadequate for PCR testing. The median time of lesion specimen collection from rash onset was 2 daysfor both suspected cases with positive and non-positive results. However, no PCR positive lesion specimens were collected after day 9 of rash.

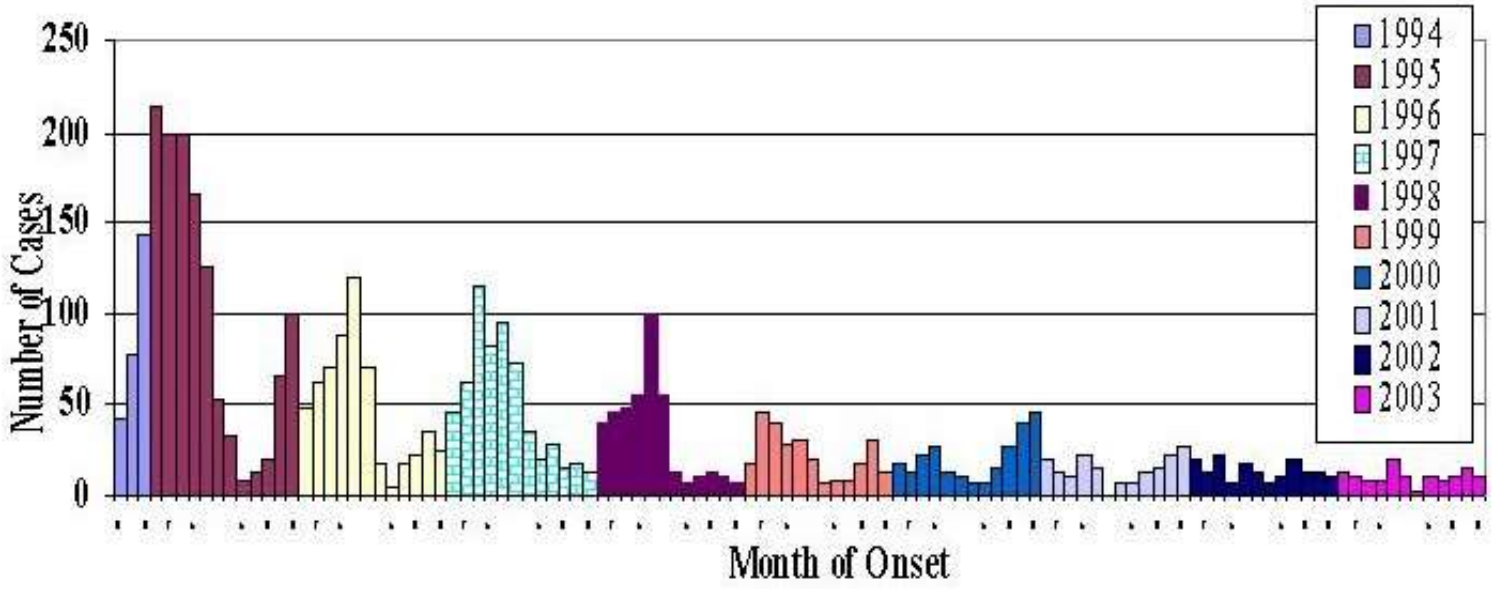
For the breakthrough reports with positive PCR results, slightly under one-third (30.2%) with VZV IgM testing performed had a positive or equivocal result, while three-fourths (75.0%) with acute and convalescent serologic specimens collected and performed on the same assay had a titer rise. Only 2 of 9 (22.2%) reports having lesion specimens as well as acute and convalescent serologic specimens collected were PCR positive for wildtype VZV with positive/equivocal VZV IgM results and an acute to convalescent VZV IgG titer rise. Two of 6 reports with VZV DFA testing performed had positive results, while the other 3 had inadequate specimens for testing and one case had a negative result. Overall, 104 of the 275 breakthrough reports (37.8%) were confirmed as true cases with positive PCR, positive/equivocal VZV IgM, an acute to convalescent VZV IgG rise, and/or a positive VZV DFA. None of the 4 suspected breakthrough cases who received 2 doses of the varicella vaccine were confirmed by laboratory testing.

Appendix A

Antibiotic Resistance of Selected Enteric Pathogens, Philadelphia, 2003

Pathogen	Antibiotics Tested	Resistant (%)	Intermediate (%)	Total Tested
Campylobacter				
	Ampicillin	0 (0)	0 (0)	1
	Erythromycin	2 (6)	0 (0)	34
	Ciprofloxacin	5 (13)	0 (0)	38
	Trimethoprim/ Sulfamethoxazole	1 (20)	1 (20)	5
	Doxycycline	0 (0)	0 (0)	0
	Ceftriaxone	0 (0)	2 (66.7)	3
Salmonella				
	Ampicillin	54 (23)	1 (0.4)	232
	Erythromycin	0 (0)	1 (33)	3
	Ciprofloxacin	1 (0.5)	0 (0)	201
	Trimethoprim/ Sulfamethoxazole	3 (1)	0 (0)	227
	Doxycycline	0 (0)	0 (0)	2
	Ceftriaxone	1 (2)	10 (18)	55
Shigella				
	Ampicillin	234 (64)	0 (0)	364
	Erythromycin	0 (0)	0 (0)	0
	Ciprofloxacin	0 (0)	0 (0)	337
	Trimethoprim/ Sulfamethoxazole	159 (43)	64 (17)	370
	Doxycycline	0 (0)	0 (0)	0
	Ceftriaxone	1 (2)	0 (0)	50

Attachment 1. Varicella Cases by Month of Onset, October 1994 to December 2003*



*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.

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	Occupation
| |		☐ M ☐ F	

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)	Fatal (check one)
		☐ Clinical ☐ Lab confirmed	☐ 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 by *immediately* by telephone.
Please fax all completed reports to 215-545-8362, or call 215-685-6748 to report case by phone.

LIST OF REPORTABLE COMMUNICABLE DISEASES

Philadelphia Department of Public Health
DIVISION OF DISEASE CONTROL

ANNUAL COMMUNICABLE DISEASE TOTALS

(**NR** = Not reportable, **NA** = Not available)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
ACQUIRED IMMUNODEFICIENCY SYNDROME	1,825	1,413	1,294	1,297	1,223	909	1,383	1,077	1,127	1,138	976
AMEBIASIS	21	10	4	9	27	4	15	31	30	20	18
ANIMAL BITES	2,012	2,210	1,911	2,184	2,120	2,345	2,130	2,096	1,894	1,922	1,612
ANTHRAX	0	0	0	0	0	0	0	0	0	0	0
BOTULISM	0	0	0	0	0	0	1	1	1	3	3
BRUCELLOSIS	0	0	0	0	0	0	0	0	0	1	0
CAMPYLOBACTERIOSIS	220	211	138	193	157	142	132	148	90	97	114
CHLAMYDIA TRACHOMATIS	10,053	9,956	8,079	8,118	10,480	11,763	12,660	13,593	13,586	15,234	17,747
CHOLERA	0	0	0	0	0	0	0	0	0	0	0
CRYPTOSPORIDIOSIS	NR	NR	24	20	14	14	24	22	13	15	19
CYCLOSPORIASIS	NR	NR	NR	NR	NR	NR	NR	NR	1	0	2
DIPHTHERIA	0	0	0	0	0	0	0	0	0	0	0
ENCEPHALITIS , excluding West Nile Virus	2	0	0	1	5	0	1	1	5	6	9
ESCHERICHIA COLI O157:H7	NR	NR	7	5	3	6	7	6	42	17	14
GIARDIASIS	172	165	182	180	179	130	105	132	120	135	113
GONORRHEA	10,580	8,026	6,565	6,415	6,504	7,271	7,776	8,170	8,061	7,277	5,731
GUILLIAN-BARRE SYNDROME	1	1	2	1	1	0	2	3	2	2	0
HAEMOPHILUS INFLUENZAE [type b]	NR [1]	NR [1]	NR [5]	NR [4]	NR [2]	NR [0]	NR [0]	NR [0]	7 [1]	8 [1]	14 [1]
HEPATITIS A	15	30	22	269	176	133	62	255	98	70	179
HEPATITIS B	163	147	104	134	171	155	152	134	111	97	51
HEPATITIS C, ACUTE, (Non-A, Non-B until 1998)	1	4	1	0	7	0	3	1	1	4	3
HISTOPLASMOSIS	0	0	0	0	1	0	0	2	1	2	2
LEGIONELLOSIS	4	4	4	8	9	15	15	19	3	10	23
LEPTOSPIROSIS	0	0	0	0	0	0	0	0	1	1	0
LISTERIOSIS	NR	NR	NR	3	6	5	10	12	8	19	11
LYME DISEASE	115	152	206	225	184	179	220	165	99	179	159
MALARIA	8	11	4	8	10	11	10	11	16	16	19
MEASLES	0	2	0	1	7	1	0	0	1	0	0
MENINGITIS, aseptic	11	10	16	11	39	26	25	68	71	112	120
MENINGITIS, bacterial	19	23	20	10	32	12	15	23	15	21	7*
MENINGOCOCCAL INFECTIONS	19	15	13	18	15	13	13	24	12	15	15
MUMPS	8	4	7	9	5	1	5	2	1	1	2
PERTUSSIS	130	58	29	100	46	31	44	61	34	31	98
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	0	1	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	0	1	1	1	4	0	2	4	0
RUBELLA, including congenital rubella syndrome	2	0	0	1	0	1	0	0	0	0	0
SALMONELLOSIS, excluding typhoid	388	332	472	424	395	319	346	328	287	324	316
SHIGELLOSIS	196	91	293	412	361	123	129	115	139	191	696
STREP PNEUMONIAE, INVASIVE	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	101
STREPTOCOCCUS, INVASIVE Gp. A [# with TSS]	NR	NR	NR	NR	NR	NR	NR	NR	14 [7]	16 [1]	43 [3]
SYPHILIS - PRIMARY & SECONDARY	515	298	199	141	108	89	69	67	77	71	98
SYPHILIS - CONGENITAL	153	106	65	63	35	24	8	9	4	4	3
SYPHILIS - TOTAL	3,752	2,006	1,299	1,298	1,091	796	826	622	639	589	587
TETANUS	0	0	0	0	1	0	0	0	0	0	0
TOXIC SHOCK SYNDROME, staphylococcal	1	0	0	0	2	1	0	0	0	1	0
TOXOPLASMOSIS	0	0	0	0	1	2	3	2	3	0	0
TUBERCULOSIS	333	276	309	250	233	179	184	169	144	147	120
TULAREMIA	0	0	1	1	0	0	0	0	0	0	0
TYPHOID FEVER	1	0	6	2	1	4	1	2	2	1	1
WEST NILE VIRUS	NR	NR	NR	NR	NR	NR	NR	0	2	6	24
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.