DESCRIPTIVE EPIDEMIOLOGY OF

REPORTABLE DISEASES

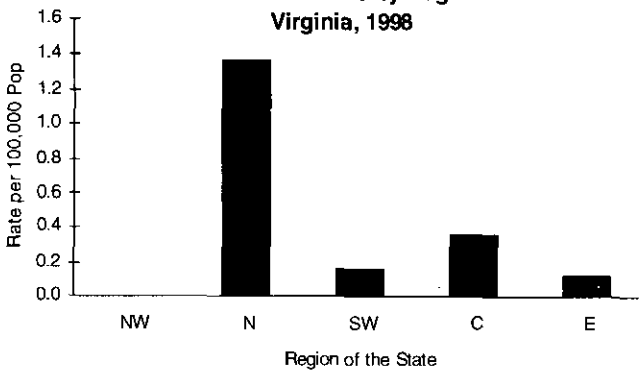
Acquired Immunodeficiency Syndrome (AIDS)

See HIV/AIDS.

Amebiasis

Thirty-one cases of amebiasis were reported in 1998 compared to 30 in 1997 and 28 in 1996. The distribution of cases by onset of illness was fairly even throughout the year. The 40-49 year age group had the highest incidence rate (6 cases, 0.6 per 100,000). Race was reported for only 13 of the 31 cases. Of these, five were in the other race category, four were black, and four were white. Males were twice as likely to be reported as females (19 cases, 0.6 per 100,000 males compared to 10 cases, 0.3 per 100,000 females). Gender was not reported for two cases. The northern health planning region had the highest number of cases and incidence rate (23 cases, 1.4 per 100,000) as shown in Figure 1.

Figure 1
Amebiasis: Rate by Region
Virginia, 1998



Anthrax

The last case of anthrax in Virginia was reported in 1970.

Arboviral Infection

Four cases of arboviral infection were reported in 1998 compared to seven in 1997. Arboviral infections are caused by any of a number of viruses transmitted by arthropods such as mosquitoes and ticks. These infections generally occur during the warm weather months when mosquitoes and ticks are most active. Virginia had its first human case of eastern equine encephalitis (EEE) since 1990. This fatal case of arboviral infection occurred in the eastern region of Virginia. EEE is relatively rare and only three other human cases are known to have ever occurred in Virginia. Three cases of LaCrosse encephalitis also were reported in 1998. These cases occurred in the southwest region of the state where six cases of LaCrosse had been reported in 1997. All four of the 1998 cases of arboviral infection occurred between July and September.

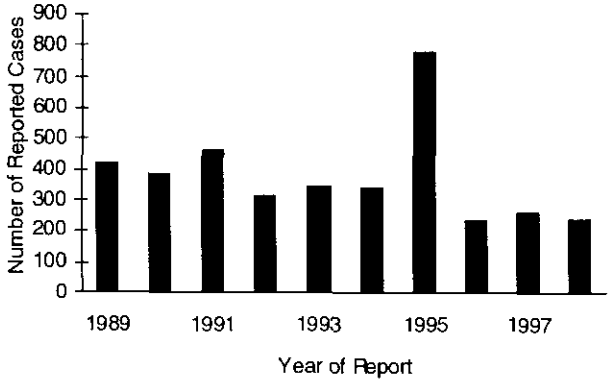
Arboviral infection is also included under the heading Encephalitis, Primary.

Aseptic Meningitis

In 1998, 240 aseptic meningitis cases were reported. This number is comparable to the 262 cases reported in 1997 and represents a general declining trend in the annual number of reported cases (Figure 2). The onset of disease was highest during the third quarter and peaked during August when 45 (19%) cases occurred.

Infants were at the greatest risk for this disease (26 cases, 28.9 per 100,000), followed by the age group 1-9 years (43 cases, 5.2 per 100,000). By race, the other race category had a higher incidence rate (5.2 cases per 100,000 population) than blacks (3.7 per 100,000) and whites (2.8 per 100,000). The risk for males and females for this disease was comparable (3.7 and 3.4 cases per 100,000 population, respectively).

Figure 2
Aseptic Meningitis: Ten Year Trend
Virginia, 1989-1998



The northern and eastern health planning regions had the highest number of cases and highest incidence rates (77 cases, 4.6 per 100,000 and 75 cases, 4.3 per 100,000, respectively). Incidence rates in the other health planning regions ranged from 0.6 per 100,000 in the central region to 3.9 per 100,000 in the southwest region.

Aseptic Meningitis was removed from the reportable disease list effective January 1999.

Bacterial Meningitis

The number of reported cases of bacterial meningitis continues a general downward trend. The 57 cases in 1998 represented the lowest number of cases ever recorded. A list of the bacterial agents and the frequency with which they were reported in 1998 is presented in Table 8. Cases occurred throughout the year but peaked during the first quarter when 20 (35%) of the 57 cases had onset of illness.

Infants were at the greatest risk for this disease. They had an incidence rate of 13.4 cases per 100,000 population. Incidence rates in the other age groups ranged from 0.2 to 1.2 cases per 100,000 population. Blacks were at greater risk for bacterial meningitis (1.6 cases per 100,000 population) than whites (0.6 per 100,000). No cases were reported for the other race category. Females were at slightly greater risk (1.0 per 100,000) than males (0.7 per 100,000).

Table 8. Etiology of Bacterial Meningitis Cases Reported in Virginia, 1998

Organism	Number of Cases	Percent of Cases
Enterobacter	1	1.8
Escherichia coli	2	3.5
Haemophilus influenzae	4	7.0
Listeria monocytogenes	1	1.8
Serratia species	1	1.8
Staphylococcus:		
S. epidermis	1	1.8
S. aureus	4	7.0
Streptococcus:		
S. pneumoniae	29	50.9
Group B	3	5.3
unspecified	2	3.5
Unspecified	9	15.8
TOTAL	57	100.0

By health planning region, the northwest region had the highest incidence rate (1.4 cases per 100,000 population), followed by the eastern region (1.2 cases per 100,000 population). Incidence rates in the other health planning regions ranged from 0.4 to 0.9 cases per 100,000 population.

Four deaths related to bacterial meningitis were reported in 1998. The persons who died were aged 7 months, 47 years, 56 years, and 64 years.

Meningitis caused by *Neisseria meningitidis* is included under the heading Meningococcal Infection.

Botulism

The first laboratory confirmed case of foodborne botulism in three years was reported in 1998. The patient was an adult from the southwest region of

the state. *Clostridium botulinum* type A was identified in the patient's stool and in a sample of home-canned vegetables. Foodborne botulism generally results when a food contaminated with *C. botulinum* is preserved improperly and stored under anaerobic conditions that permit germination, multiplication, and toxin production.

Brucellosis

One case of brucellosis was reported in 1998. Brucellosis is a zoonotic disease that has been infrequently reported in Virginia in recent years. Reported cases in Virginia have usually occurred in persons associated with the meat-processing industry. This person worked with animals on a farm where infection most likely occurred.

Campylobacteriosis

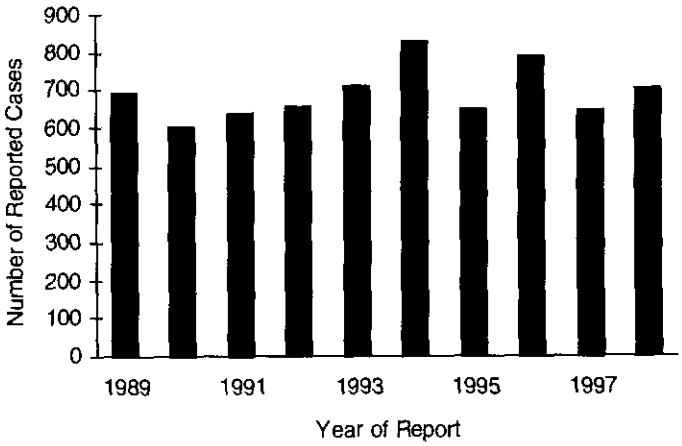
The total number of reported enteric infections in Virginia caused by *Campylobacter* is second only to the number caused by *Salmonella*. The 700 cases reported in 1998 represented a 9% increase above the 644 cases reported in 1997 (Figure 3).

C. jejuni was identified as the species responsible for 60% of the cases. The species was recorded as unknown for 39% of the cases.

Almost one-half of the cases occurred during May through August. Peak activity was observed in July when 96 (14%) of the cases occurred.

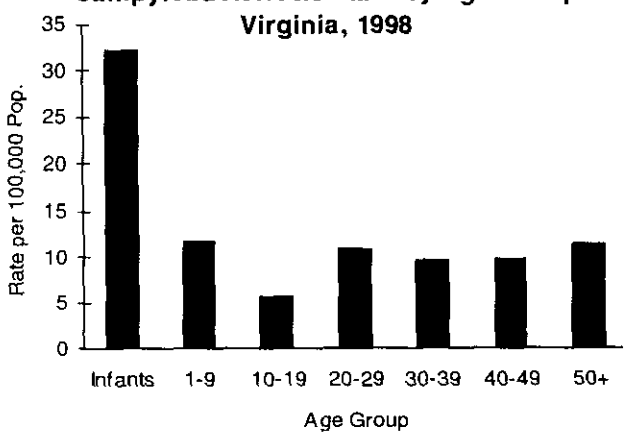
The age group with the highest incidence rate was infants (32.3 cases per 100,000 population). The 1-9 year old age group followed with a rate of 11.8 per 100,000. The lowest incidence rate (5.5 cases per 100,000 population) was in the 10-19 year old age group (Figure 4).

Figure 3
Campylobacteriosis: Ten Year Trend
Virginia, 1989-1998



Race was reported as unknown for 322 (46%) of the cases. Where race was recorded, the white race category had the highest incidence rate at 6.4 cases per 100,000 population. The incidence rate in the black race category was 2.9 cases per 100,000 population. The number of cases and incidence rate reported was greater in males (390 cases, 11.8 per 100,000) than in females (287 cases, 8.4 per 100,000).

Figure 4
Campylobacteriosis: Rate by Age Group
Virginia, 1998



The highest incidence rate was in the northwest health planning region (18.9 cases per 100,000 population), followed by the southwest region (11.4 per 100,000). The lowest incidence rate (5.4 cases per 100,000 population) was reported from the eastern region.

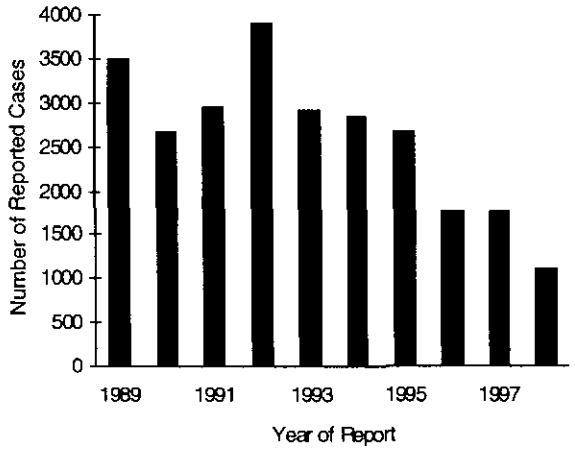
Chancroid

Seven cases of chancroid were reported in 1998 compared to one in 1997. Six of the seven cases were reported from the eastern health planning region and one was reported from the southwest.

Chickenpox (Varicella)

The number of reported cases of chickenpox decreased for the sixth consecutive year (Figure 5). The 1,115 cases of chickenpox reported in 1998 were 645 (37%) cases fewer than the 1,760 cases reported in 1997.

Figure 5
Chickenpox: Ten Year Trend
Virginia, 1989-1998



The highest number (607) of cases and the highest incidence rate (35.0 per 100,000) occurred in the eastern health planning region. Incidence rates in the other health planning regions ranged from 2.1 to 17.9 cases per 100,000 population.

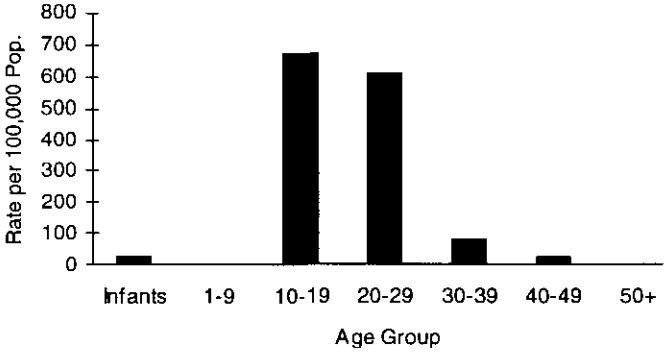
A varicella virus vaccine has been licensed for use in all children over the age of twelve months and for adults who are susceptible to chickenpox.

Chlamydia trachomatis Infection

Chlamydia trachomatis infection has emerged as the most commonly reported disease under surveillance in Virginia. During 1998, 13,370 cases of *C. trachomatis* infection were reported. This was a 15% increase over the 11,604 cases reported in 1997. This increase followed three years of decline.

Incidence rates were highest in the 10–19 and the 20–29 year age groups (671.6 per 100,000 and 613.9 per 100,000, respectively) as shown in Figure 6. Race was recorded as unknown for 2,140 persons. Where race was reported, the highest number (7,739) of cases occurred in blacks who also had the highest incidence rate (575.8 per 100,000). The other race category had the second highest incidence rate (267.1 per 100,000), followed by whites (54.9 per 100,000). The female to male ratio was 6 to 1. It should be noted that health department screening is limited to high risk females and male partners of positive females.

Figure 6
***Chlamydia trachomatis*: Rate by Age Group**
Virginia, 1998



Cases were heavily distributed in the central (313.3 per 100,000) and eastern (275.3 per 100,000) health planning regions. The rates in the northwest, southwest, and northern health planning regions were 157.9 per 100,000, 143.7 per 100,000, and 102.5 per 100,000, respectively.

The data are expected to underestimate the incidence *of C. trachomatis* infections because (1)

screening has been limited to high risk females attending certain public health clinics and the male partners of positive females, (2) as many as 75% of women and 25% of men with uncomplicated *C. trachomatis* infection are asymptomatic, and (3) persons with gonorrhea presumptively treated for *C. trachomatis* infection are not included in the case counts. The Centers for Disease Control and Prevention (CDC) estimate the morbidity due to this organism to be twice that of gonorrhea. There were 9,215 cases of gonorrhea reported in Virginia in 1998, suggesting that there were more than 18,000 *C. trachomatis* infections last year, using the CDC method to estimate cases.

Congenital Rubella Syndrome

No cases of this condition have been reported in Virginia since 1981.

Diphtheria

The last case of this vaccine-preventable disease in Virginia was reported in 1989.

Ehrlichiosis, Human

Ehrlichiosis is an acute disease of humans and animals caused by bacteria named *Ehrlichia.* There are two clinically similar but serologically distinct forms of ehrlichiosis: human granulocytic ehrlichiosis (HGE) caused by infection with an *Ehrlichia equi*-like agent and human monocytic ehrlichiosis (HME) caused by *Ehrlichia chaffeensis* infection. These organisms, which are transmitted by ticks, can infect two different types of white blood cells.

Four confirmed cases of human ehrlichiosis were recorded in Virginia in 1998 compared to three cases in 1997. All four cases were HME. The onset of illness for these four persons occurred between May and August. Race was reported as white for three cases and black for one. All cases occurred in adults ranging in age from 36 to 71 years. Males outnumbered females three to one.

Two cases were reported from the southwest health planning region. The central and eastern health planning regions each had one case reported. Ehrlichiosis was added to the reportable disease list effective January 1999; however, reports have been recorded beginning in 1986.

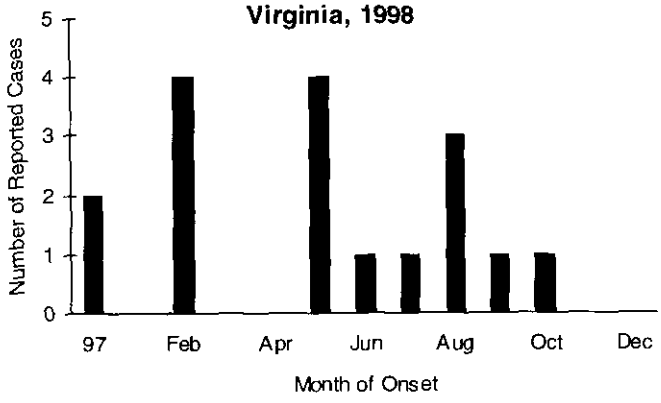
Encephalitis, Primary

Seventeen cases of primary encephalitis were reported in 1998 compared to 30 cases in 1997. The etiologic agents were reported as viral for 13 of the 1998 cases and unspecified for the remaining four. Of the 13 reported as viral, three were further specified as LaCrosse virus, three as herpes virus, and one as eastern equine encephalitis virus. Infection caused by the LaCrosse virus and eastern equine encephalitis virus are also included under the heading Arboviral Infection.

Cases occurred throughout the year but were more frequent during February and May when four persons each month had onset of illness (Figure 7). Children in the 1-9 year age group were at greatest risk for this disease (0.6 cases per 100,000 population). Incidence rates for the other age groups ranged from 0.1 to 0.3 cases per 100,000 population. Blacks and whites had comparable incidence rates (0.3 cases per 100,000 population). No cases were reported for the other race category. The risk for males for acquiring this disease was twice that for females (0.4 per 100,000 vs. 0.2 per 100,000, respectively).

Incidence rates were highest in the eastern and the southwest health planning regions (0.5 and 0.4 cases per 100,000 population, respectively). No cases were reported from the central health plan-

Figure 7.
Primary Encephalitis by Month of Onset, Virginia, 1998



ning region. One adult male died of primary encephalitis (see under heading Arboviral Infection).

Encephalitis, Post-Infectious

No cases of post-infectious encephalitis were reported in 1998 compared to three in 1997.

Escherichia coli O157:H7

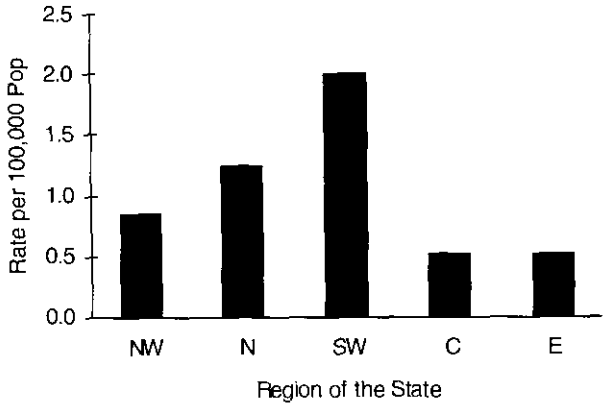
Escherichia coli O157:H7 infection became a notifiable condition in Virginia in January 1999; however, the Office of Epidemiology has been maintaining statistical data from voluntary reporting of this disease since 1992.

The number of these reports decreased by 22% in 1998. Sixty-nine cases were reported in 1998, compared to 88 in 1997 and 53 in 1996. In general, the annual number of reported cases of *E. coli* O157:H7 infection has been increasing.

Historically, cases are reported throughout the year but increase abruptly beginning in June. In 1998, activity peaked between the months of June and August when 36 (52%) cases occurred. Persons 1-9 years of age were at the greatest risk for *E. coli* O157:H7 infection (3.5 cases per 100,000 population), followed by infants (2.2 per 100,000). The incidence rate was 1.0 cases per 100,000 population or less for each of the other age groups. Race was reported for only 57% of the cases. Of these, 36 were in whites (0.7 per 100,000), two were in the other race category (0.8 per 100,000) and one was in blacks (0.1 per 100,000). Males were slightly more at risk than females.

The southwest health planning region had the highest number (25) of cases reported and the highest incidence rate (2.0 cases per 100,000 population), followed by the northern region (21 cases, 1.2 per 100,000) (Figure 8).

Figure 8
***E. coli* O157:H7: Rate by Region**
Virginia, 1998



An *E. coli* O157:H7 outbreak occurred in the southwest health planning region in 1998. Nine cases (seven children and two adults) were identified in this outbreak that was linked to a day care center. Person-to-person transmission seemed to be the most likely cause of this outbreak.

Also in 1998, two distinct clusters of *E. coli* 1057:H7 infection were identified. Five cases were associated with one of the clusters linked to eating frozen ground beef patties that had been recalled by a wholesale distributor. Eight cases were associated with the other cluster that also was suspected of being linked to ground beef, but could not be linked to any recall product.

Fifth Disease

Fifth disease is not an officially reportable disease in Virginia; however, reports are recorded when they are received. Although fifth disease usually produces a mild self-limited illness, severe complications of infection can occur. No cases were reported in 1998 compared to one case in 1997.

Foodborne Outbreaks

Sixteen confirmed foodborne outbreaks were reported in 1998. These outbreaks are summarized in Table 9. The number of ill persons identified for each outbreak ranged from one to 78. The etiologic agent was confirmed or suspected as bacterial for eight outbreaks, viral for four, and chemical for one. The suspected etiologic agent was not reported for three outbreaks.

A specific food item was implicated in eleven of the outbreaks. Common food handling practices related to these outbreaks included inadequate cooking and improper storage or holding temperatures.

Fungal Diseases

Fungal diseases other than histoplasmosis are not officially reportable in Virginia; however, selected fungal diseases are recorded when reports are received. In 1998, recorded fungal diseases other than histoplasmosis included 18 cases of aspergillosis and one fatal case of cryptococcosis.

Meningitis caused by *Cryptococcus neoformans* is included under the heading Other Meningitis.

Giardiasis

The number of cases of giardiasis increased to 503 for 1998 and is the highest number of cases reported in the last ten years (Figure 9). The majority of the cases had onset during the months of August to November as shown in Figure 10.

Figure 9
Giardiasis: Ten Year Trend
Virginia, 1989-1998

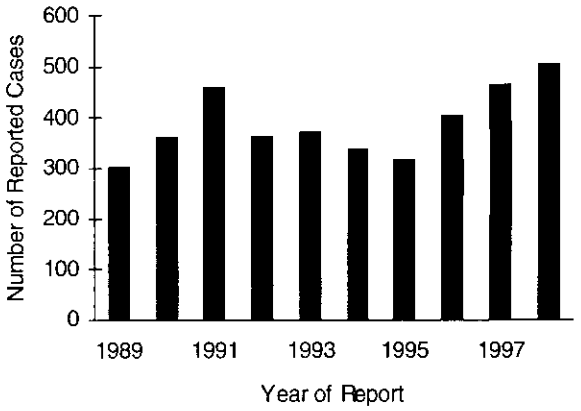
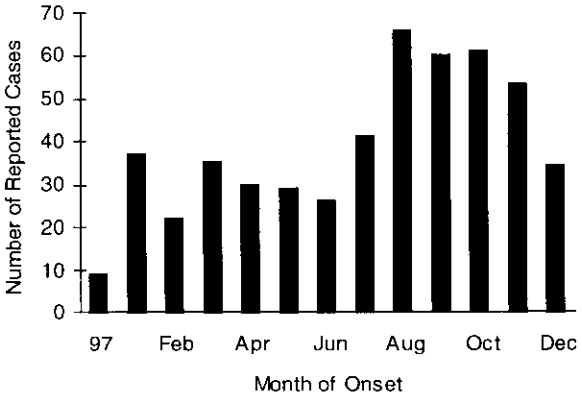


Figure 10
Giardiasis by Month of Onset,
Virginia, 1998



The highest incidence rate (19.5 cases per 100,000 population) occurred in children aged 1-9 years, followed by infants (10.0 per 100,000). Race was recorded as unknown for 272 (54%) cases. Of the cases for which race was reported, the other race category had the highest incidence rate (9.6 cases per 100,000 population), followed by whites (3.5 per 100,000), and blacks (2.0 per 100,000). Males

were slightly more likely than females to be reported with this disease (7.4 vs. 6.6 cases per 100,000 population, respectively).

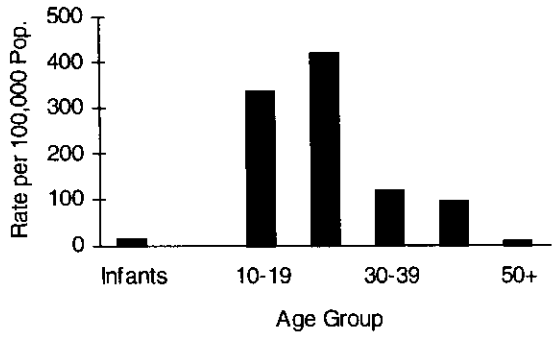
The northern health planning region had the highest incidence rate (11.1 per 100,000 population) and the southwest had the lowest (4.6 per 100,000).

Gonorrhea

In 1998, 9,215 cases of gonorrhea were reported in Virginia. This is a 6% increase from the 8,731 cases reported in 1997. This increase reversed a three-year decline in the number of cases reported annually.

Young adults (aged 20-29) were most likely to be reported with gonorrhea. They had the highest number of cases reported (4,087) and the highest incidence rate (416.6 per 100,000), followed by the 10 to 19 year age group (332.8 per 100,000) as shown in Figure 11.

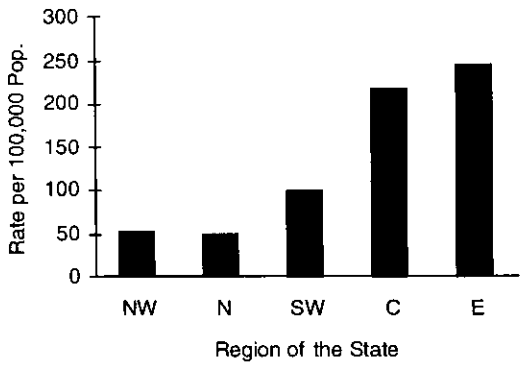
Figure 11
Gonorrhea: Rate by Age Group
Virginia, 1998



Seventy-eight percent of the cases were in blacks (7,220 cases, 537.2 per 100,000), 10% were in whites (885 cases, 15.9 per 100,000), and 2% were in the other race category (164 cases, 65.3 per 100,000). Race was not specified for 10% of the cases. By gender, 4,690 cases were reported in males (142.2 cases per 100,000 population) compared to 4,523 cases in females (134.4 cases per 100,000 population). Gender was not reported for two cases.

The eastern health planning region reported the most cases (4,216 cases, 243.2 per 100,000), followed by the central (2,457 cases, 216.3 per 100,000), southwest (1,230 cases, 98.3 per 100,000), northern (812 cases, 48.0 per 100,000), and northwest (482 cases, 51.4 per 100,000) regions (Figure 12).

Figure 12
Gonorrhea : Rate by Region
Virginia, 1998



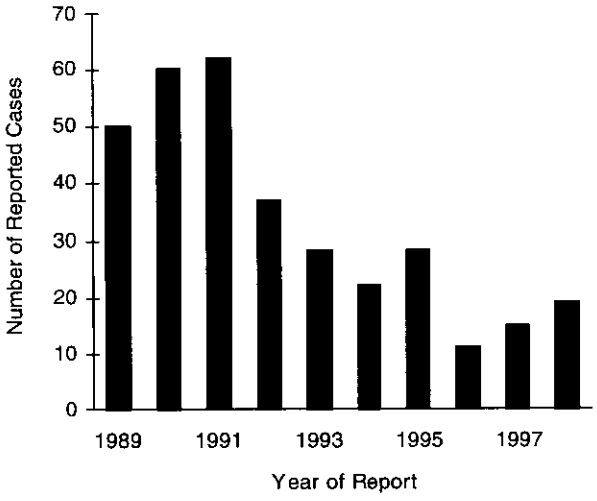
Granuloma Inguinale

No cases of this sexually transmitted disease have been reported in Virginia since 1990.

Haemophilus influenzae Infection, Invasive

The number of reported cases of invasive *Haemophilus influenzae* infection increased for the second consecutive year. Nineteen cases were reported in 1998 compared to fifteen cases in 1997 and a ten-year low of 11 cases in 1996 (Figure 13). Despite the increase, only two cases reported in 1998 were in children <5 years of age, the age group for which vaccine is recommended against serotype b. Serotype f was reported in one of these cases, and the serotype was specified as unknown in the other.

Figure 13
Invasive *H. influenzae:* Ten Year Trend
Virginia, 1989-1998



Peak activity for this disease was observed during the first quarter of the reporting year when nine cases occurred. Infants were at the greatest risk with an incidence rate of 2.2 cases per 100,000 population. Seven cases occurred in blacks for an incidence rate of 0.5 per 100,000, and nine cases were in whites (0.3 per 100,000). No cases were reported among persons in the other race category and race was recorded as unknown for three cases. The risk for disease in males was comparable to the risk in females (0.3 per 100,000 each).

The northwest and central health planning regions had the highest incidence rates (0.4 cases per 100,000 population). The incidence rate was 0.2 cases per 100,000 population in each of the other health planning regions.

No deaths due to invasive *H. influenzae* infection were reported in 1998.

Meningitis caused by *H. influenzae* is also included under the heading Bacterial Meningitis.

Hansen Disease (Leprosy)

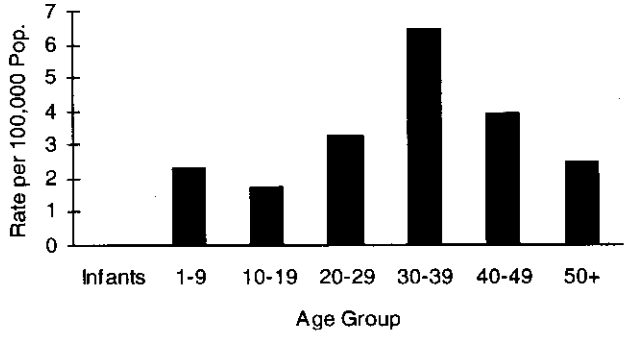
No cases of this disease of low frequency in Virginia were reported in 1998. One case had been reported in 1997.

Hepatitis A

The annual number (226) of reported cases of hepatitis A decreased in 1998 by 10% from the 250 cases reported in 1997. Three of the five health planning regions experienced a decrease between 1997 and 1998. The most noticeable decrease by health planning region occurred in the southwest which was down 33% from the previous year. An outbreak of hepatitis A in Shenandoah County contributed to an increase in the number of cases reported from the northwest region. The outbreak occurred among elementary school aged children and their parents and siblings.

Adults in the 30-39 year age group were most at risk for hepatitis A (6.5 cases per 100,000 population), followed by adults in the 40-49 year age group (4.0 per 100,000) as shown in Figure 14. Whites (2.6 cases per 100,000 population) were at greater risk for hepatitis A than blacks (1.6 per 100,000) and persons in the other race category (1.2 per 100,000). Race, however, was not reported for 66

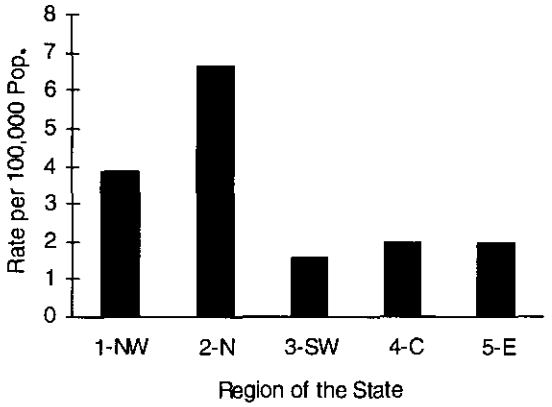
Figure 14
Hepatitis A: Rate by Age Group
Virginia, 1998



(29%) cases. The incidence rate for males (156 cases, 4.7 per 100,000) was over two times higher than the rate for females (68 cases, 2.0 per 100,000). Gender was not recorded for two cases.

The northern health planning region reported the most cases and had the highest incidence rate (113 cases, 6.7 per 100,000) of all regions. Incidence rates by region are illustrated in Figure 15.

Figure 15
Hepatitis A: Rate by Region
Virginia, 1998



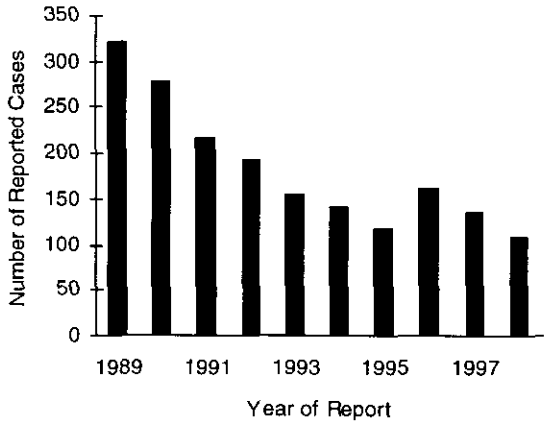
Risk factor data was reported for 89 (39%) of the hepatitis A cases. International travel (17 cases) and personal contact with a person with hepatitis A (16 cases) were the predominant potential sources of infection among these persons with hepatitis A.

No deaths due to acute hepatitis A infection were reported in 1998.

Hepatitis B

The annual number of reported cases of this vaccine-preventable disease decreased to a ten year low in 1998 (Figure 16). The total of 109 cases reported in 1998 was 20% less than the 137 cases reported in 1997. Cases occurred throughout the year but the frequency was highest during the first six months of the year when 65% of the cases occurred.

Figure 16
Hepatitis B: Ten Year Trend
Virginia, 1989-1998



By age, the highest number of cases and incidence rates were reported in adults who accounted for 99 (91%) cases in 1998. Risk was greater for adults between 20 and 49 years of age (2.4 cases per 100,000 population) than those aged 50 and older (1.3 cases per 100,000 population). Blacks were at the greatest risk for hepatitis B. The incidence rate for blacks was 3.7 cases per 100,000 population compared to 2.0 per 100,000 for the other race category and 0.7 per 100,000 for whites. Cases were fairly evenly distributed between the sexes (55 males and 51 females); sex specific incidence rates also were comparable (1.7 cases and 1.5 cases per 100,000, respectively). Gender was not reported for three cases.

The eastern health planning region had the highest number of cases reported and the highest incidence rate (43 cases, 2.5 per 100,000). The central and northern regions followed with similar incidence rates (1.6 and 1.5 cases per 100,000 population, respectively).

Information regarding various risk factors for persons reported with hepatitis B was available for 31 (28%) cases. Having multiple sex partners was the most frequently reported potential source of infection for hepatitis B.

No deaths were reported.

Hepatitis Non-A Non-B

Thirteen cases of acute viral hepatitis non-A non-B were reported in 1998 compared to 27 cases in 1997. Disease onset for the majority (77%) of the cases occurred during the first half of the reporting year.

Cases ranged in age from 20 to 53 years with a mean age of 37 years. Adults aged 30-39 (0.4 cases per 100,000 population) were more likely to be reported with this disease than other age groups. Blacks and whites had comparable incidence rates (0.2 cases per 100,000 population). No cases were reported for the other race category. Seven males were reported with hepatitis non-A non-B compared to six females.

Incidence rates by health planning region ranged from 0.4 cases per 100,000 population in the northwest region to 0.1 per 100,000 in the northern and central regions.

Hepatitis C virus (HCV) has been identified as the primary etiologic agent of hepatitis non-A non-B in the United States. Six (46%) of the hepatitis non-A non-B cases reported in Virginia in 1998 were reported to have tested positive for antibodies to HCV in addition to having symptoms of acute hepatitis.

No deaths were reported in 1998.

Hepatitis Unspecified

Six cases of viral hepatitis unspecified were reported in 1998 compared to three cases in 1997. No deaths were reported.

Hepatitis unspecified has been removed from the list of reportable conditions in Virginia effective January 1999.

Histoplasmosis

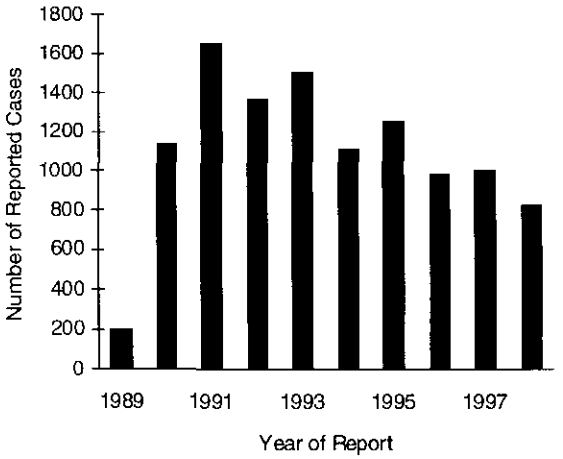
Six cases of histoplasmosis were reported in 1998 compared to four cases in 1997. The six cases reported in 1998 were adults who ranged in age from 31 to 58 years (mean=45 years). Race was reported as black for two persons, white for one person, and recorded as unknown for the remaining three. Males outnumbered females 5 to 1.

Human Immunodeficiency Virus (HIV) Infection and the Acquired Immunodeficiency Syndrome (AIDS)

HIV

During 1998, 825 new HIV infections were reported, bringing the cumulative total of cases reported since 1989 to 11,027. The 825 cases reported in 1998 were the lowest number of new infections reported for a full year since reporting began in July 1989 (Figure 17).

Figure 17
HIV Infection: Ten Year Trend
Virginia, 1989-1998

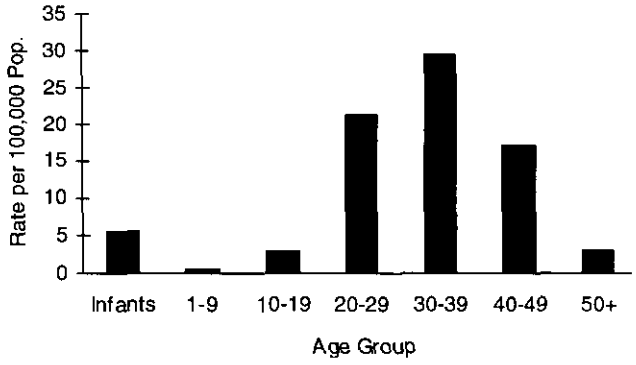


Males continue to represent the majority (577 cases, 70%) of HIV case reports. The incidence rate for males was 17.5 per 100,000. Females had 248 (30%) HIV case reports in 1998 (7.2 cases per 100,000 population). Though the number of cases in females remains much lower than the number of cases in males, the percentage of cases that were female in 1998 (30%) was the highest since reporting began.

During 1998, the majority of cases were in blacks (69%, 567 cases) followed by whites (26%, 211 cases) and other minorities (5%, 42 cases). Race was not reported for 5 cases. Nonwhites were nine times more likely than whites to be infected, having an incidence rate of 38.2 per 100,000 compared to 4.1 per 100,000 for whites.

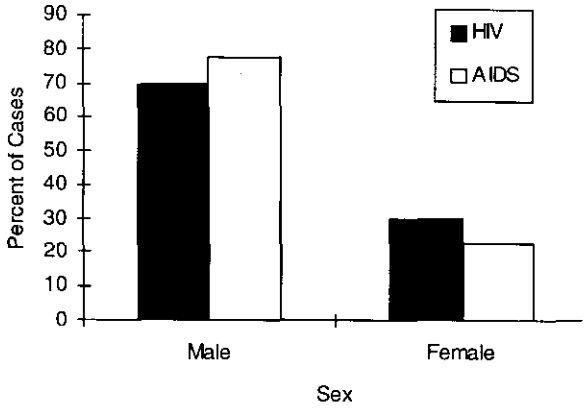
Persons in the 30-39 year age group had the higest incidence rate (346 cases, 29.4 per 100,000), followed by the 20-29 year age group (210 cases, 21.4 per 100,000), and the 40-49 year age group (178 cases, 17.1 per 100,000) as shown in Figure 18. Ten pediatric HIV infections were reported in 1998. All of the children were infected through maternal transmission.

Figure 18
HIV Infection: Rate by Age Group
Virginia, 1998



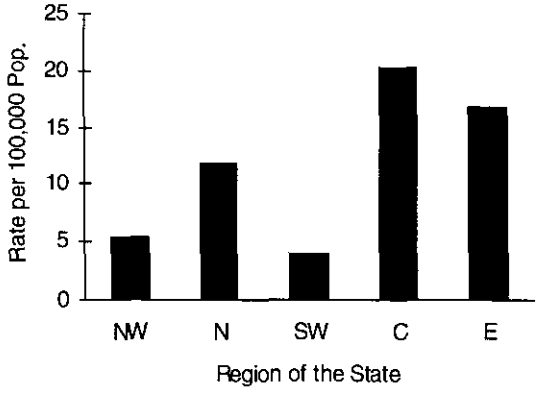
Compared to AIDS in 1998, persons with HIV infection were more likely to have become infected through heterosexual contact (27% HIV vs. 22% AIDS) and less likely to attribute their infection to men having sex with men (32% HIV vs. 39% AIDS). Females comprised a larger proportion of HIV infections (30%) than AIDS cases (23%) as shown in Figure 19.

Figure 19
A Comparison of AIDS and HIV Infections by Sex, Virginia, 1998



The highest HIV incidence rate was calculated for the central health planning region (20.4 per 100,000), followed by the eastern (16.8 per 100,000), northern (11.8 per 100,000) northwest (5.4 per 100,000) and southwest (4.1 per 100,000) health planning regions (Figure 20).

Figure 20
HIV Infection: Rate by Region
Virginia, 1998

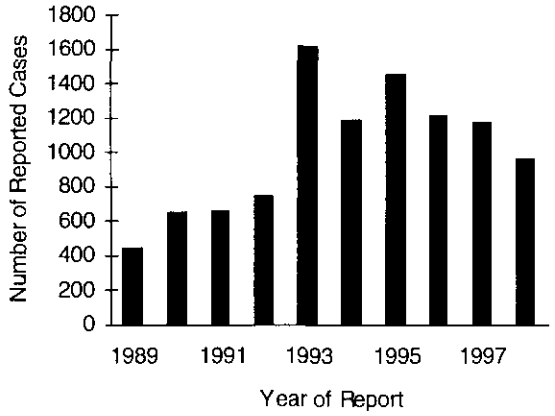


AIDS

Since the first AIDS cases were reported in 1982, the cumulative number of cases reported through the end of 1998 is 11,111, with 6,239 deaths (56%).

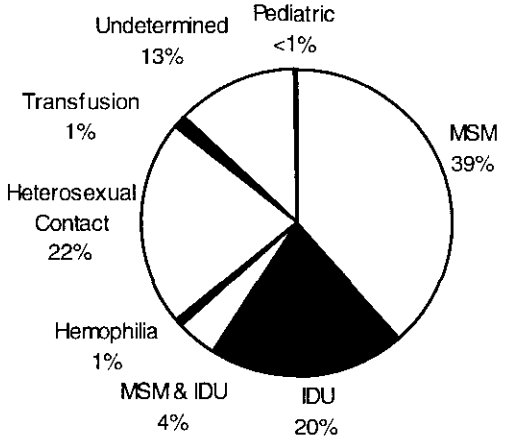
In 1998, 963 cases were reported, representing an 18% decrease from 1997 (Figure 21).

Figure 21
AIDS: Ten Year Trend
Virginia, 1989-1998



AIDS is caused by the human immunodeficiency virus (HIV). The most common modes of transmission are through unprotected sexual intercourse (especially anal intercourse) and injecting drug use (IDU). During 1998, men having sex with men (MSM) accounted for the greatest percentage of AIDS cases (39%), followed by heterosexual contact (22%) as shown in Figure 22.

Figure 22
AIDS: Mode of Transmission
Virginia, 1998



The majority (708 cases, 74%) of AIDS cases were between the ages of 30 and 49. The age group with the highest incidence rate was the 30-39 age group with 35.9 cases per 100,000 population. Four pediatric AIDS cases were reported in 1998. All of the children were infected via maternal transmission.

This is the sixth consecutive year that the majority of reported AIDS cases were in blacks (636 cases, 66%). Two hundred ninety-seven (31%) cases occurred in whites and 30 (3%) cases occurred in the other race category. Non-whites were more than 7 times more likely than whites to be reported with AIDS, having an incidence rate of 43.4 per 100,000 compared to 6.1 per 100,000 in whites. Males also represented a disproportionate share, with an incidence rate three and one-half times higher than females (23.7 vs. 6.7 per 100,000).

The central health planning region experienced the highest incidence rate (21.9 per 100,000), followed by the eastern region (20.7 per 100,000), the northwest region (10.7 per 100,000), the northern region (10.2 per 100,000), and the southwest region (6.6 per 100,000).

Persons with AIDS develop a variety of life-threatening opportunistic infections due to immunosuppression. The most commonly diagnosed disease was *Pneumocystis carinii* pneumonia (PCP). One sixth (17%) of the cases reported during 1998 developed PCP during the course of the illness. Other frequently diagnosed conditions include HIV wasting syndrome (7%), esophageal candidiasis (4%), *Mycobacterium avium* complex (3%), HIV encephalopathy (2%) and Kaposi's sarcoma (2%). More than half of the reported cases (63%) were reported as immunologic (low CD4 counts) under the 1993 expanded definition of AIDS.

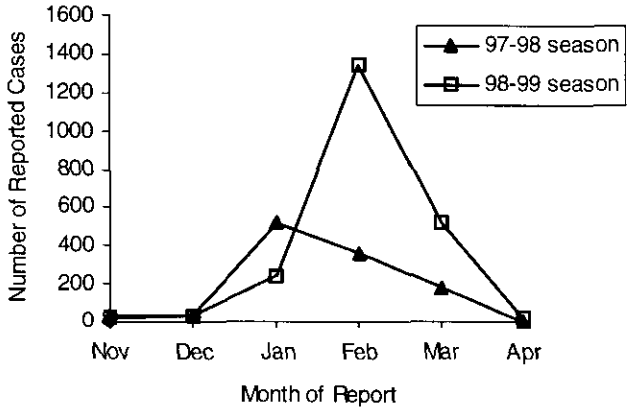
Influenza

The influenza season in Virginia typically runs from the fourth quarter (October - December) of one year through the first quarter (January - March) of the following year. During this period, the health department conducts active influenza surveillance

using sentinel physicians from around the state who report cases of influenza-like illness on a weekly basis. Cases are tabulated weekly and the information, along with laboratory identification of viral agents, is used to monitor and define influenza activity in Virginia. Activity is characterized as sporadic, regional or widespread. In addition, sporadic cases of influenza-like illness are reported throughout the calendar year through our passive disease reporting system.

During the 1997-98 season, influenza type A and influenza type B were isolated in Virginia. Widespread activity occurred from mid-January through early March, with peak activity at the end of January (Figure 23). The 1997-98 season was notable because the predominant circulating strain, A/Sydney/05/97, was an antigenic drift variant of the H3N2 strain that was in the 1997-98 vaccine. Forty-three adult residential facilities, including 32 licensed nursing homes, reported outbreaks of influenza-like illness compared to no reports during the past five influenza seasons. During the 1998-99 season, influenza type A and type B were isolated in Virginia, with A/Sydney again the predominant circulating strain. Widespread activity occurred from late January through early March, with peak activity during early February. Despite a good match between the vaccine and the circulating strains, 25 nursing homes reported outbreaks of influenza-like illness. Examination of the vaccination rates at these facilities showed that on average only 78% of the residents had received the current influenza vaccine (range 57%-95%).

Figure 23
Influenza-like Illness Reported by Sentinel Physicians in 2 "Flu Seasons"



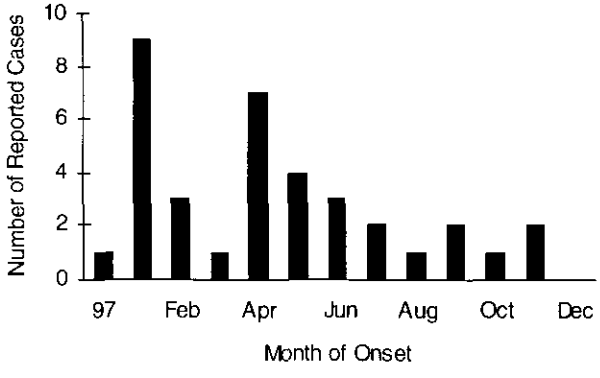
Through the passive surveillance system, 1,160 cases of influenza were reported during calendar year 1998, compared to 517 cases in 1997 and 957 cases in 1996.

The highest regional influenza incidence rate occurred in the southwest health planning region (60.6 cases per 100,000 population) and the lowest rate was reported from the northern region (2.0 per 100,000 population). Rates are based on data from the passive surveillance system.

Kawasaki Syndrome

Thirty-six cases of Kawasaki syndrome were reported in 1998 compared to 27 in 1997 and 19 in 1996. The 36 cases in 1998 were the most reported in a year since 1983 when 39 cases were reported. The cases reported in 1998 occurred throughout the year but peaked in January when nine (25%) of the cases had onset of symptoms (Figure 24).

Figure 24
Kawasaki Syndrome
by Month of Onset, Virginia, 1998



All but five of the 36 cases of this early childhood condition occurred in children five years of age or younger. The other race category had the highest incidence rate (1.2 cases per 100,000 population), followed by whites (0.5 per 100,000) and blacks (0.3 per 100,000). Males were slightly more

likely than females to be reported with Kawasaki syndrome (0.6 cases per 100,000 population vs. 0.5 per 100,000).

The northern health planning region reported the highest number of cases and had the highest incidence rate (23 cases, 1.4 per 100,000). Incidence rates in the other health planning regions ranged from 0.1 per 100,000 in the central region to 0.5 cases per 100,000 population in the southwest region. No cases were reported from the northwest health planning region.

Lead - Elevated Levels in Children

Because this condition became reportable in Virginia in mid-1993, 1998 marks the fifth full year of reporting. Any child age 15 years or younger, with a venous blood lead level ≥15 micrograms per deciliter (µg/dL), is reportable to the health department. (Note: the reportable level changed to ≥10 µg/dL in 1999).

Two hundred sixty-eight (62%) of the 431 children reported in 1998 had levels in the 15-19 µg/dL range, the category for which the Centers for Disease Control and Prevention (CDC) recommends nutritional and educational interventions and more frequent screening; 147 (34%) had levels in the 20-44 µg/dL range, for which CDC recommends medical evaluation and environmental evaluation and remediation; 16 (4%) had levels 45 and higher, requiring both medical and environmental interventions (Figure 25).

Children aged five years and younger comprised 94% of the reported cases with one and two years being the most common ages at diagnosis (38% and 21% of reported cases, respectively). Race was reported for 369 (86%) of the cases. Of these, 259 (70%) were black, 83 (22%) were white and 27 (7%) were in the other race category (Figure 26).

Figure 25
Elevated Blood Lead Levels: Age 0-15 years, Virginia, 1998

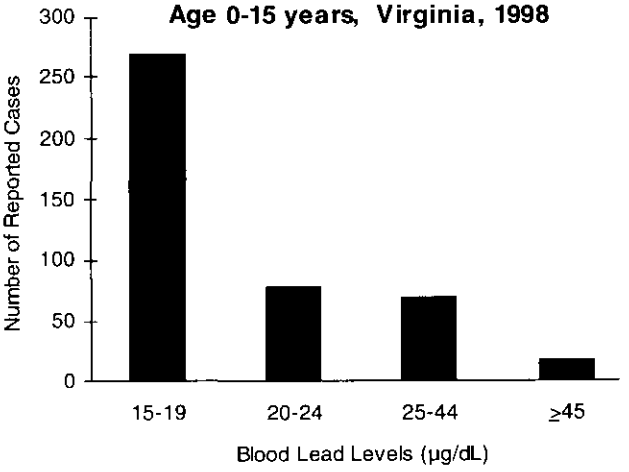
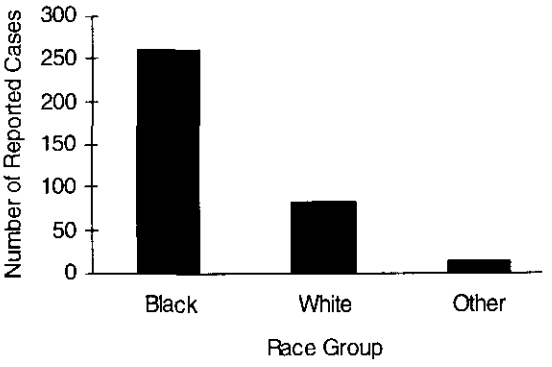


Figure 26
Race of Children with Elevated Blood Lead Levels, Virginia, 1998



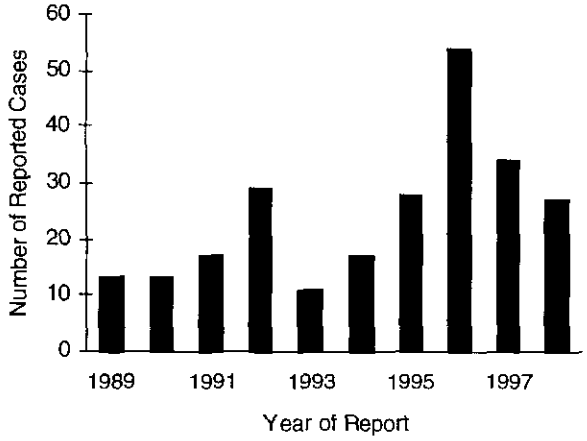
The number (230) of males reported was 29 cases more than the number (201) of females reported.

Cases were reported from all health planning regions: northwest 19 cases; northern 24 cases; southwest, which includes the federally funded lead prevention program in Lynchburg, 100 cases; central, which includes the funded programs in Petersburg and Richmond, 164 cases; and eastern which includes the funded programs in Norfolk and Portsmouth, 124 cases.

Legionellosis

Twenty-seven laboratory-confirmed cases of legionellosis were reported in 1998 compared to 34 cases in 1997 (Figure 27). In spite of this decrease, the 27 cases reported in 1998 exceeds the ten year average of 24 cases per year. Males were twice as likely as females to be reported with this disease (18 cases, 0.6 cases per 100,000 population vs. 9 cases, 0.3 per 100,000 population). Age ranged from 26 to 79 years (median=62 years). Twenty-three persons reported with legionellosis were white (0.5 cases per 100,000 population), two were black (0.2 cases per 100,000 population), and two were of unknown race.

Figure 27
Legionellosis: Ten Year Trend
Virginia, 1989-1998



Information about risk factors for illness was available for 22 persons, all but three of whom had at least one of the following risk factors: immunocompromised status, diabetes mellitus, chronic pulmonary or cardiac disease, or cigarette smoking. Cigarette smoking was the primary risk factor reported; 11 persons reported smoking ten or more cigarettes per day.

Cases were reported from all but the central health planning district. The highest number of cases was reported from the southwest health planning region (12 cases, 1.0 per 100,000 population). No deaths due to legionellosis were reported.

Leptospirosis

One case of leptospirosis was reported in 1998 compared to none in 1997 and two cases in 1996. Leptospirosis often results from exposure to urine-contaminated feed or water sources.

Listeriosis

Nine cases of listeriosis were reported in 1998 (including one case of meningitis). Cases occurred sporadically throughout the year with no clustering of cases reported.

Persons with listeriosis ranged in age from 50 years to 74 years (mean=64 years). Age was recorded as unknown for one person. Six were white (0.1 cases per 100,000 population), two were black (0.2 per 100,000), and one was in the other race category (0.4 per 100,000). Females were at slightly greater risk for listeriosis than males (0.2 cases vs. 0.1 cases per 100,000 population).

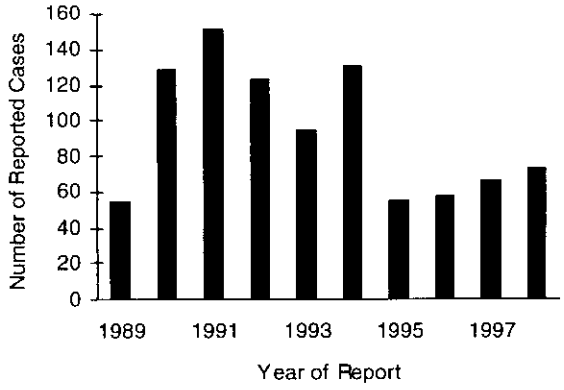
Three cases were reported from the northwest and eastern health planning regions. Two cases were reported from the southwest health planning region and one case from the northern region. No cases were reported from the central health planning region. Risk, however, was greatest in the northwest region where the incidence rate was 0.3 cases per 100,000 population. No deaths were reported.

Meningitis due to listeriosis is also included under the heading Bacterial Meningitis.

Lyme Disease

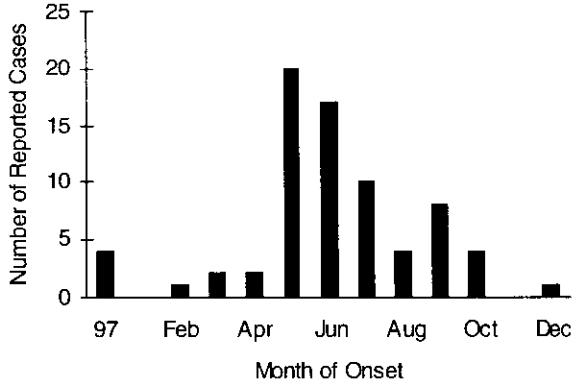
Seventy-three cases of Lyme disease were reported in 1998, compared to 67 cases in 1997. Figure 28 shows the annual trend since Lyme disease became a reportable condition in mid-1989.

Figure 28
Lyme Disease: Trend
Virginia, 1989-1998



Forty-seven (64%) cases occurred during May through July (Figure 29). Persons with Lyme disease ranged in age from 2 to 81 years (median=36 years). The highest incidence rate occurred in the 1-9 year age group (12 cases, 1.4 cases per 100,000 population) followed by the 50 year and older age group (20 cases, 1.2 per 100,000 population). Cases were evenly distributed among males (37 cases) and females (36 cases). The rate among whites (61 cases, 1.2 per 100,000 population) was higher than in blacks (4 cases, 0.3 per 100,000 population) and in persons in the other race category (1 case, 0.4 per 100,000 population). Race was not reported for seven persons.

Figure 29
Lyme Disease by Month of Onset,
Virginia, 1998



The predominant symptom reported was erythema migrans (44 cases, 60%). Other symptoms reported were arthritis (34%), Bell's palsy (11%), lymphocytic meningitis (8%), radiculoneuropathy (5%), encephalitis (4%), and 2nd or 3rd degree atrioventricular block (3%).

Cases of Lyme disease were reported from all health planning regions with the highest rate (1.6 cases per 100,000 population) reported from the northwest region. *Borrelia burgdorferi*, the causative organism for Lyme disease in this country, has been isolated from rodents and ticks in several counties in Virginia.

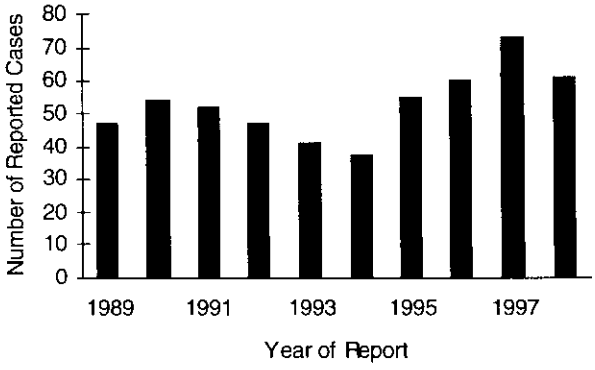
Lymphogranuloma Venereum

No cases of lymphogranuloma venereum were reported in 1998. Two cases had been reported in 1997.

Malaria

In 1998, 61 cases of malaria were reported compared with 73 cases in 1997 (Figure 30).

Figure 30
Malaria: Ten Year Trend
Virginia, 1989-1998



The 30-39 year age group had the highest incidence rate (1.4 cases per 100,000 population), followed by the 10-19 year age group (1.3 per 100,000).

Race was reported as unknown for 17 (28%) of the cases. Where race was reported, blacks had

the highest incidence rate (2.2 cases per 100,000 population), followed by the other race category (1.2 per 100,000) and whites (0.2 per 100,000). Males were twice as likely to be reported with malaria as females (1.2 vs. 0.6 per 100,000).

The majority (72%) of cases was reported from the northern health planning region. Each of the other health planning regions reported from 2 to 6 cases.

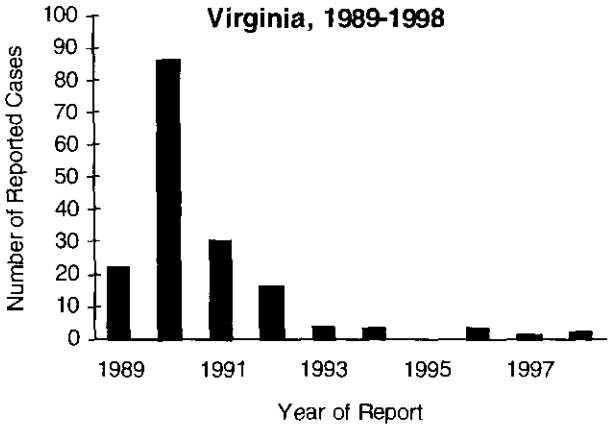
Sixty (98%) of the cases are believed to have acquired malaria while in another county. Africa was the probable source of malaria for 34 cases, Central America 8 cases, Asia 8 cases and South America one case. The probable source of malaria was not reported for nine persons. One case of malaria (*Plasmodium falciparum)* was confirmed in a Virginia resident who had not traveled outside of the U.S. The last time malaria had been transmitted within the U.S. was in 1996.

The *Plasmodium* species was reported for 45 (74%) cases. *P. falciparum* was reported in 26 cases, 18 of whom had travel histories to Africa. *P. vivax* accounted for 15 cases and travel was divided between Africa (5), Asia (3), and South and Central America (4); the travel history was not reported for three cases. *P. malariae* was reported in 3 cases and *P. ovale* in 1 case. Only two reported cases were in U.S. military personnel. The status of the remaining cases was reported as U.S. civilians (15 cases), civilians of other countries (25 cases) or status unknown (19 cases).

Measles

Compared to previous years, the number of reported measles cases remains low; two cases were reported in 1998. Zero cases were reported in 1995 and the annual number of reported cases has not been more than four in the past six years (Figure 31).

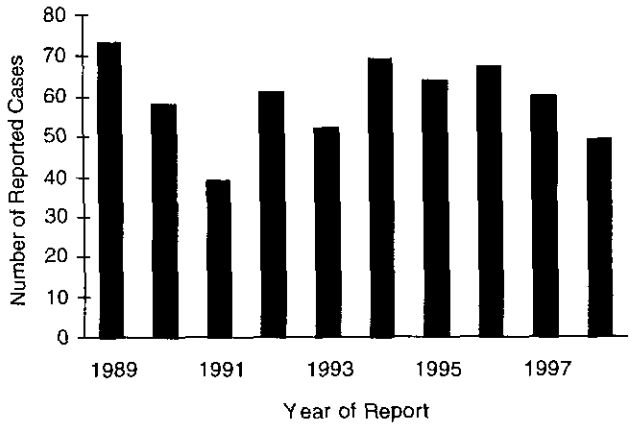
Figure 31
Measles: Ten Year Trend
Virginia, 1989-1998



Meningococcal Infection

The number of cases of meningococcal infection reported during 1998 was 49, an 18% decrease from the 60 cases reported in 1997 (Figure 32). Onset of illness was distributed throughout the year. The highest number of cases occurred during the first (16 cases, 33%) and fourth (14 cases, 29%) quarters.

Figure 32
Meningococcal Infection: Ten Year Trend
Virginia, 1989-1998



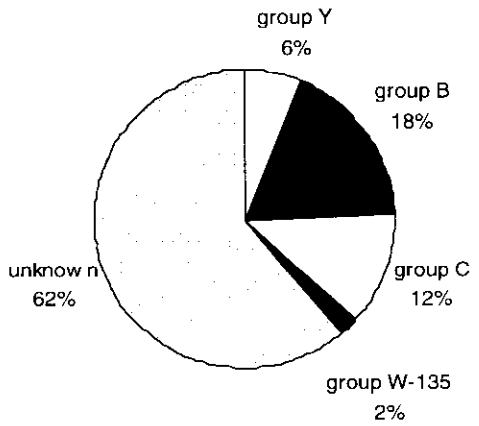
Infants had the highest incidence rate (14.5 cases per 100,000 population), followed by persons in the 10-19 year age group (1.0 per 100,000 population) and the 1-9 and 20-29 year age groups (0.7 per 100,000 population each).

Blacks and whites had almost the same incidence rate (0.7 cases per 100,000 population and 0.6 cases per 100,000 population, respectively). Persons in the other race category had an incidence rate of 0.4 per 100,000 population. Males and females were equally at risk (0.7 cases per 100,000 population).

The highest incidence rate was reported from the northwest health planning region (11 cases, 1.2 per 100,000 population) followed by the eastern region (13 cases, 0.8 per 100,000 population), and southwest (9 cases, 0.7 per 100,000 population).

Serogroup was reported for 19 (39%) of the reported cases: 9 were group B, 6 group C, 3 group Y, and 1 group W-135 (Figure 33). The organism was isolated from cerebrospinal fluid in 9 cases, blood in 27 cases, cerebrospinal fluid and blood in 10 cases, and not reported for 3 cases. One death due to meningococcal disease was reported in a 35 year old male.

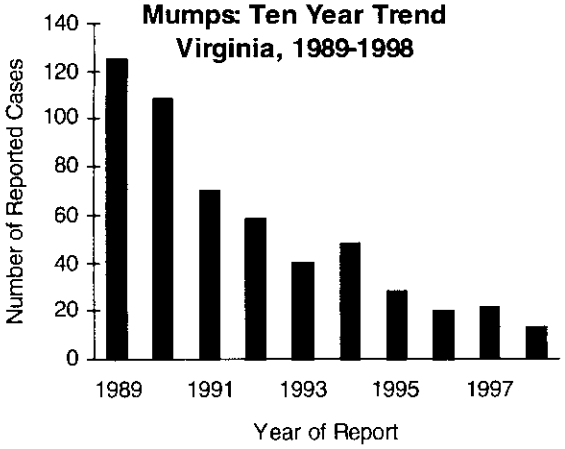
Figure 33
Meningococcal Serogroups
Virginia, 1998



Mumps

Reported mumps cases continue to decline. The thirteen cases reported in 1998 represented a ten-year low (Figure 34). Cases occurred throughout the year with a peak in December with three cases.

Figure 34
Mumps: Ten Year Trend
Virginia, 1989-1998



Children in the 1-9 year age group had the highest incidence rate for mumps (0.4 cases per 100,000 population), followed by adults in the 30-39 year age group (0.3 per 100,000). No cases were reported for infants or adults aged 50 and older.

The other race category (0.4 cases per 100,000 population) was at greater risk for acquiring mumps than blacks (0.3 per 100,000) and whites (0.1 per 100,000). Race was recorded as unknown for one case. The male to female ratio was 3 to 1.

The risk for mumps was greatest in the eastern health planning region (6 cases, 0.4 per 100,000). Incidence rates in the other three health planning regions ranged from 0.1 to 0.2 cases per 100,000 population.

Nosocomial Outbreaks

A nosocomial outbreak refers to any group of illnesses of common etiology occurring in patients in hospitals or nursing homes acquired by exposure to the disease agent while confined in such facilities. Thirty-eight nosocomial outbreaks were reported in 1998; 32 of which were outbreaks of influenza. Approximately 800 cases of laboratory confirmed influenza and influenza-like illness were reported. These outbreaks resulted in 60 hospitaliza-

tions and 37 deaths. Influenza type A was laboratory confirmed in 11 outbreaks.

A Norwalk-like virus was confirmed as the cause of four outbreaks in 1998 that were characterized by symptoms of gastroenteritis. One of these also had a concurrent *Salmonella hadar* outbreak that was believed to have resulted from person-to-person transmission.

A laboratory confirmed *Clostridium perfringens* outbreak and a scabies outbreak were also reported in nursing facilities.

Occupational Illnesses

During 1998, 349 cases of the following occupational illnesses were reported to the health department: asbestosis (323 cases, 93%), lead poisoning (20 cases, 6%), mercury poisoning (4 cases, 1%), and arsenic poisoning (2 cases, <1%). The remainder of this section will present further information on the cases of asbestosis.

Of the 323 persons reported with asbestosis, only three were female. Cases ranged in age from 35 to 88 years (mean=63 years). Race was not reported for any of the cases.

Cases were reported from the eastern (98%) and central (2%) health planning regions. The industries employing the most persons reported with asbestosis were shipbuilding (270 cases, 84%) and the railroad industry (16 cases, 5%).

Ophthalmia Neonatorum

Fifteen cases of ophthalmia neonatorum were reported in 1998; 14 were caused by *Chlamydia trachomatis* infection and one was caused by *Neisseria gonorrhoeae*. By race, six infants were black, one was white and one was in the other race category. Race was recorded as unknown for seven cases. Thirteen cases of ophthalmia neonatorum had been reported in 1997.

Other Meningitis

Thirty-five cases of meningitis caused by organisms other than bacteria and viruses were recorded in 1998. Seventeen (49%) cases were caused by *Cryptococcus neoformans*. The organism was not specified for the remaining 18 cases. Meningitis caused by *C. neoformans* was reported exclusively in adults who ranged in age from 26 to 73 years (mean=44 years). Four also were reported with human immunodeficiency virus (HIV) infection.

Persons with other meningitis for which an organism was not reported ranged in age from infants to 69 years (mean=39). None of these persons was reported with HIV infection.

Blacks were at greater risk for this disease (15 cases, 1.1 per 100,000) than whites (18 cases, 0.4 per 100,000) and the other race category (1 case, 0.4 per 100,000). Males had the highest number (22) of cases reported and the highest incidence rate (0.7 per 100,000) compared to females (13 cases, 0.4 per 100,000).

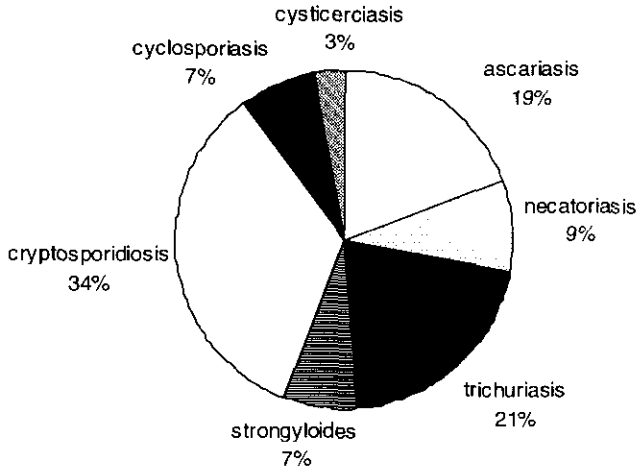
Five deaths occurred among persons reported with this category of meningitis; three males and two females. Two of the three males who died also had HIV infection compared to one of the two females. The persons who died ranged in age from 33 to 63 years.

Parasites, Intestinal

In addition to amebiasis and giardiasis, selected reports of other parasitic intestinal diseases are recorded. In 1998, 68 laboratory confirmed cases of intestinal parasites were recorded: 23 cases of

cryptosporidiosis, 14 cases of trichuriasis (whipworm), 13 cases of ascariasis (roundworm), 6 cases of necatoriasis (hookworm), 5 cases of cyclosporiasis, 5 cases of strongyloidiasis, and 2 cases of cysticercosis (Figure 35).

Figure 35
Intestinal Parasites
Virginia, 1998



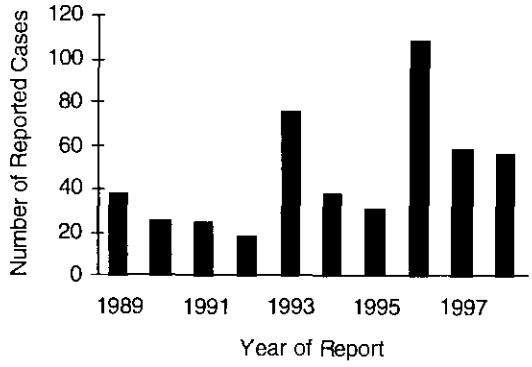
Activity peaked during September when thirteen (19%) cases occurred. The 1-9 year age group accounted for the highest number (21) of cases and the highest incidence rate (2.5 cases per 100,000 population). Incidence rates in the other age groups ranged from 0.2 per 100,000 in adults aged 40-49 years to 1.9 cases per 100,000 in adults aged 20-29 years. Race was not reported for 44% of the cases. Where race was reported, 15 (40%) cases were in the other race category. Thirty-six (53%) cases were in males compared to 30 (44%) in females. Gender was recorded as unknown for the remaining two cases.

The central health planning region had the highest incidence rate (1.6 cases per 100,000 population). Incidence rates in the other health planning regions ranged from less than 1.0 per 100,000 in the northwest, southwest and eastern regions to 1.2 per 100,000 in the northern region.

Pertussis

In 1998, 56 confirmed cases of pertussis were reported. Pertussis has been one of the most frequently reported childhood vaccine-preventable disease in Virginia in recent years (Figure 36). Cases occurred throughout the year, but peaked during the month of October when 11 (20%) cases had onset of symptoms.

Figure 36
Pertussis: Ten Year Trend
Virginia, 1989-1998

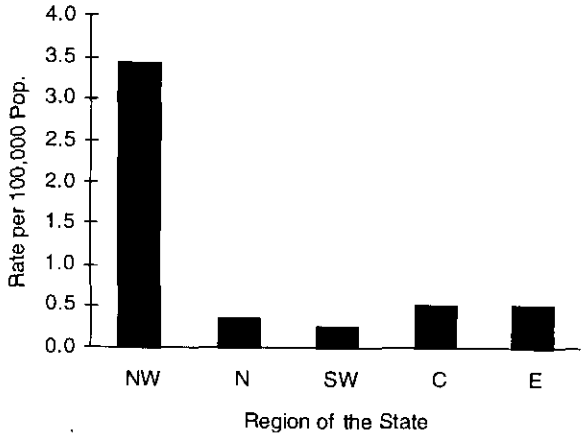


Infants had the highest incidence rate at 21.0 cases per 100,000 population, followed by the 10-19 year age group (23 cases, 2.5 per 100,000). Incidence rates in the other age groups were less than 1.0 case per 100,000 population.

Forty-three (77%) pertussis cases were in whites; however, the incidence rate for each race category was less than 1.0 case per 100,000 population. Females and males had comparable incidence rates (0.8 per 100,000).

The majority (57%) of cases were reported from the northwest health planning region where the incidence rate (3.4 per 100,000) was more than four times greater than the state's overall incidence rate of 0.8 cases per 100,000 population (Figure 37). No deaths due to pertussis were reported.

Figure 37
Pertussis: Rate by Region
Virginia, 1998



Phenylketonuria (PKU)

Two infants were identified as having PKU through newborn screening programs in 1998 compared to one in 1997.

Plague

No cases of plague have been reported in Virginia during the twentieth century.

Poliomyelitis

The last reported case of poliomyelitis in Virginia occurred in 1978.

Psittacosis

Psittacosis is a disease of low frequency in Virginia. One case was reported in 1998 compared to none in 1997.

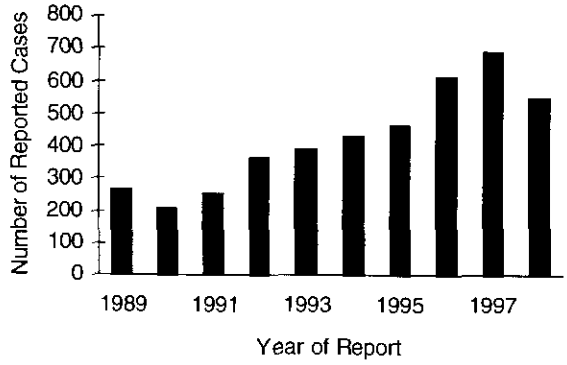
Q Fever

No cases of Q fever were reported in 1998. One case had been reported in Virginia in 1997.

Rabies in Animals

The total number (549) of laboratory confirmed rabid animals decreased in 1998, reversing a seven-year trend which began in 1991 (Figure 38). The 549 cases reported in 1998 were 20% fewer than the 690 cases reported in 1997. One hundred three fewer rabid raccoons and thirty fewer rabid skunks were reported in 1998 compared to 1997. In spite of the decrease, raccoon rabies was reported in four localities that had not previously reported it: Russell County, Tazewell County, Washington County, and Waynesboro.

Figure 38
Rabies in Animals: Ten Year Trend
Virginia, 1989-1998

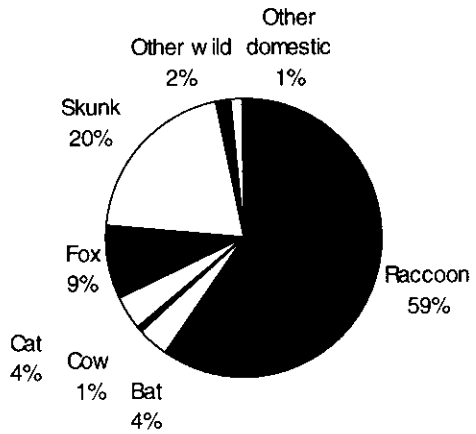


The localities with the highest numbers of rabid animals in 1998 were Fairfax County (including the cities of Fairfax and Falls Church) with 69 rabid animals (13% of reported cases), and Loudoun County with 34 (6% of reported cases). The remaining localities contributed four percent or fewer cases each to the total number of rabid animals.

For the seventeenth consecutive year, raccoons were the most commonly reported species with rabies. The 326 rabid raccoons accounted for 59% of

all rabid animals, with 112 rabid skunks accounting for another 20% (Figure 39). The other wildlife reported as rabid in 1998 were 48 foxes, 20 bats, 6 groundhogs, 3 bobcats, and 1 opossum. Twenty-one rabid cats were reported in 1998, compared to 33 in 1997 and 29 in 1996. The other rabid domestic animals in 1998 were five cows, four dogs, two horses, and one donkey.

Figure 39
Species of Animals Positive for Rabies, Virginia, 1998



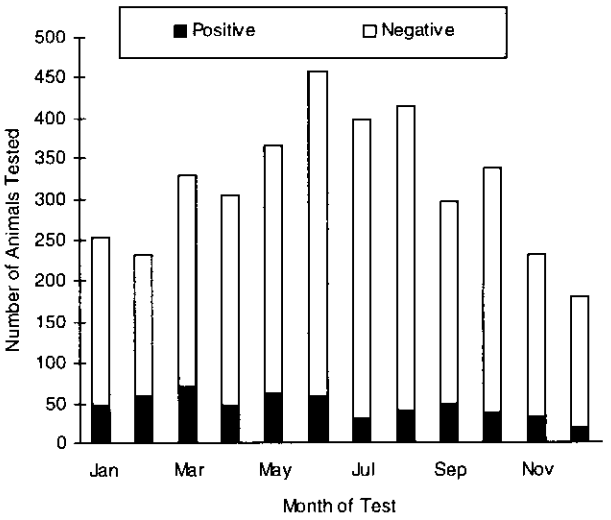
Animals Tested

The number of animals tested in 1998 was 3,809 compared to 4,483 tested in 1997. Cats were the most commonly tested animal, accounting for 25% of all animals tested. Raccoons accounted for 20% of animals tested, followed by dogs (15%), bats (9%), opossums (7%), foxes (4%), and skunks (4%). Overall, 14% of all animals tested were positive for rabies. Although skunks accounted for only 4% of all animals tested, 66% of those tested were positive. Forty-four percent of tested raccoons were positive, compared with 2% of cats and <1% of dogs. Figure 40 compares the total number of animals tested with the number positive for each month.

Human Exposure

Human exposure was reported for the rabid donkey; both rabid horses and all rabid dogs and cows. The ratio of human exposure to number of rabid

Figure 40
Animal Rabies Tests by Month and Test Result, Virginia, 1998



animals for the other species was as follows: 1/3 rabid bobcats; 5/112 rabid skunks; 7/20 rabid bats; 14/48 rabid foxes; 20/21 rabid cats; and 32/326 rabid raccoons.

Rabies in Humans

The first case of human rabies in Virginia since 1953 occurred in 1998. The patient had been incarcerated over three years and there was no history of exposure to animals, or of being bitten or scratched during this time period. Although the rabies was identified as a bat strain, the source of exposure was not determined.

During 1998, 696 persons received post-exposure prophylaxis. This number is 9% higher than the 637 reported in 1997 which had been the highest number reported since 1985 when records were first kept (Figure 41). Also, 679 persons received pre-exposure prophylaxis compared to 712 reported in 1997 and 439 in 1996.

Figure 41
Rabies Post-Exposure Prophylaxis Received, Virginia, 1990-1998

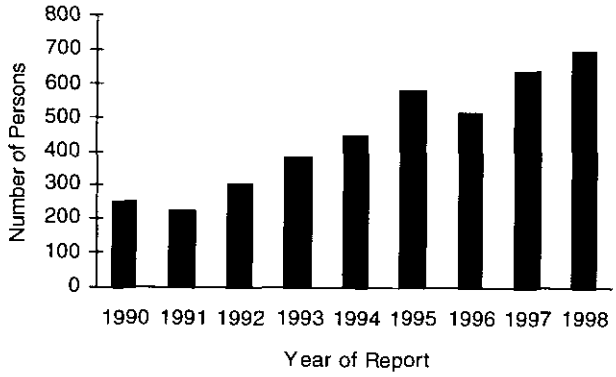
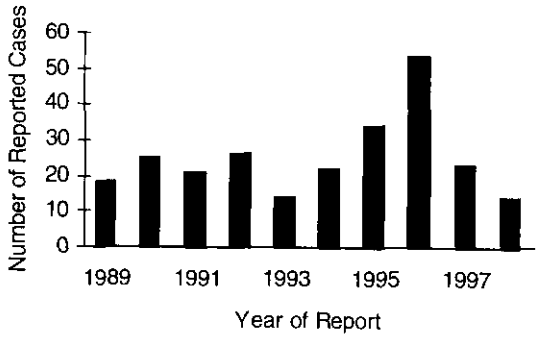


Figure 42
Rocky Mountain Spotted Fever: Ten Year Trend, Virginia, 1989-1998



Reye Syndrome

No cases of Reye syndrome were reported in Virginia in 1998. One confirmed case was reported in 1994.

Reye syndrome was removed from the reportable disease list effective January 1999.

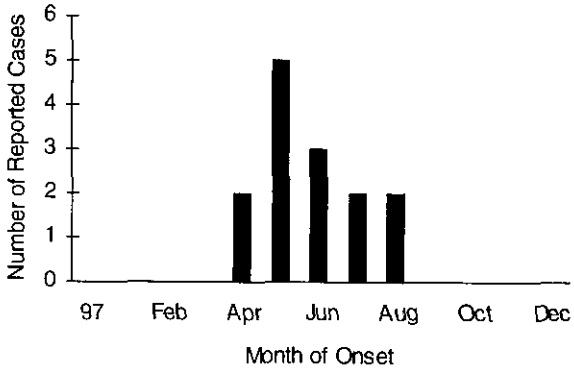
Rocky Mountain Spotted Fever

The 14 cases of Rocky Mountain spotted fever reported in 1998 represented a 39% decrease from the 23 cases reported in 1997 and equals the ten year low of 14 cases reported in 1993. Figure 42 shows the ten year trend in the number of reported cases in Virginia. Onset of cases occurred from April through August with a peak in May as shown in Figure 43.

Children aged 1-9 years had the highest incidence rate (5 cases, 0.6 per 100,000), followed by adults 50 and older (5 cases, 0.3 per 100,000).

Thirteen cases were in whites for an incidence rate of 0.3 cases per 100,000 population. No cases were reported in blacks or in the other race category. Race was recorded as unknown for one case. Males had an incidence rate of 0.3 cases per 100,000 population, which was three times higher than the incidence rate of 0.1 per 100,000 for females.

Figure 43
Rocky Mountain Spotted Fever by Month of Onset, Virginia, 1998



Incidence rates ranged from 0.1 per 100,000 in the southwest health planning region to 0.4 per 100,000 in the northern region. No cases were reported from the central region.

Six (43%) patients had a known tick bite, two (14%) had been in a tick infested area, one patient did not have a known tick exposure, and exposure status information was not available for the remaining five (36%) patients. No deaths were reported.

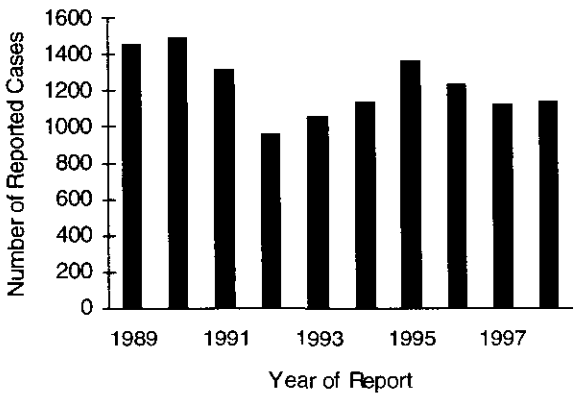
Rubella

One adult from the northern health planning region was reported with rubella in 1998. One case also was reported in 1997.

Salmonellosis

Salmonellosis continues to be the most frequently reported enteric pathogen in Virginia. In 1998, 1,135 *Salmonella* infections were reported compared to 1,220 in 1997 (Figure 44). The most commonly reported serotypes were *S. typhimurium* (259 cases) and *S. enteritidis* (228 cases), followed by *S. newport* (69 cases) and *S. heidelburg* (49 cases). These four serotypes accounted for 53% of the 69 different serotypes reported in 1998 (Table 10).

Figure 44
Salmonellosis: Ten Year Trend
Virginia, 1989-1998



Regionally, the highest incidence rate was in the central health planning region (27.0 cases per 100,000 population), followed by the northern health planning region (16.1 per 100,000). The lowest rate was in the eastern health planning region. The incidence of *Salmonella* infections peaked during the third quarter when 35% of the cases occurred (Figure 45).

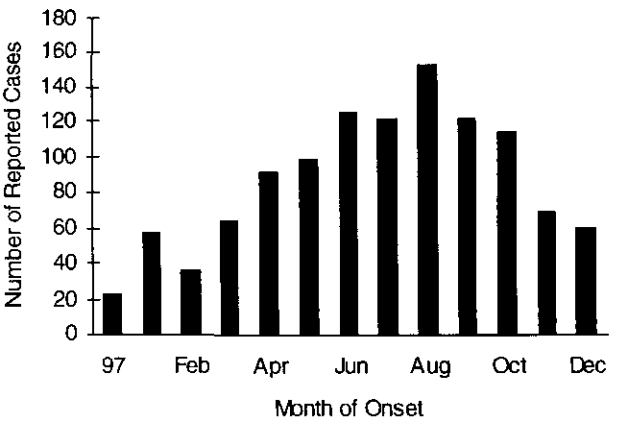
Infants were at the greatest risk for *Salmonella* infection, (144.7 cases per 100,000 population), followed by children aged 1-9 years (35.8 per 100,000).

Table 10. Number and Percent of *Salmonella* Infections by Species, Virginia, 1998

Species Causing Infection	Number of Cases	Percent of Cases
S. typhimurium	259	22.8
S. enteritidis	228	20.1
S. newport	69	6.1
S. heidelberg	49	4.2
S. hadar	21	1.9
S. javiana	21	1.9
S. braenderup	18	1.6
S. monte	13	1.2
S. muenchen	13	1.2
S. java	12	1.1
S. oranienburg	10	0.9
Unspecified	260	22.9
All Others	162	14.3
TOTAL	1135	100.0

The age group 40-49 had the lowest rate at 8.9 per 100,000 population. Blacks had the highest incidence rate (9.5 per 100,000) followed by whites (7.4 per

Figure 45
Salmonellosis by Month of Onset,
Virginia, 1998



100,000) and the other race category (6.0 per 100,000). The risk for *Salmonella* infection was higher for females (17.1 per 100,000) than for males (15.2 per 100,000).

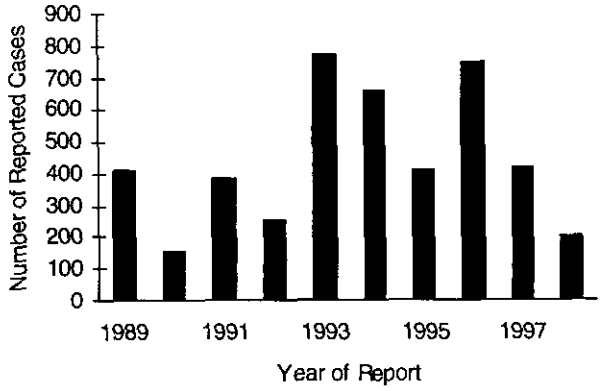
Six *Salmonella* outbreaks were reported in 1998. Two outbreaks of *S. enteritidis* and one outbreak of *S. heidelberg* were traced to food consumption (see Foodborne Outbreak section), and one *S. hadar* outbreak occurred in a nursing home and was determined to be due to person-to-person transmission. One of two community-wide outbreaks was caused by *S. enteritidis* that could not be linked to any common source. The second community-wide outbreak was caused by *S. baildon*, a serotype which prior to 1998 had rarely been identified in the United States (average of 3.1 cases annually from 1988-97). Uncooked tomatoes appear to have been the source of the outbreak.

Shigellosis

The number of reported cases of shigellosis showed a sizeable decline in 1998. The 200 cases reported in 1998 were 52% less than the 416 cases reported in 1997 and 73% less than the 746 cases reported in 1996 (Figure 46).

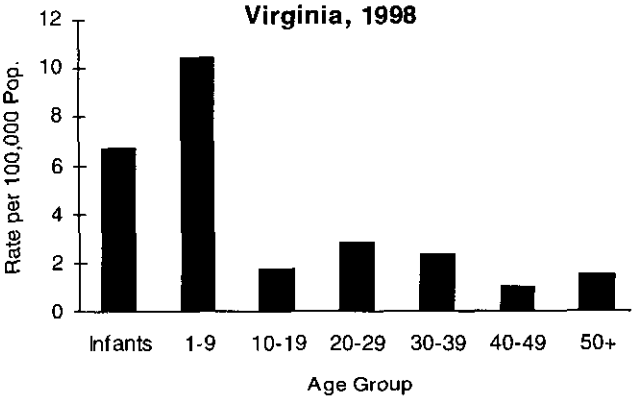
Like other frequently reported enteric diseases, *Shigella* infections occurred most often during the third quarter of the reporting year. One hundred fourteen (57%) *Shigella* infections reported were caused by *S. sonnei*; 47 infections were due to *S. flexneri*; 4 to *S. dysenteriae* and 2 to *S. boydii*. The species was not specified for 33 infections.

Figure 46
Shigellosis: Ten Year Trend
Virginia, 1989-1998



Children aged 1-9 years had the highest incidence rate (10.5 cases per 100,000 population), followed by infants (6.7 per 100,000) as shown in Figure 47. Race was recorded as unknown for 143 (72%) cases. Where race was reported, the other race category had an incidence rate of 2.4 cases per 100,000 population, followed by blacks (1.1 per 100,000), and whites (0.7 per 100,000). Females (2.9 per 100,000) were slightly more at risk than males (2.6 per 100,000).

Figure 47
Shigellosis: Rate by Age Group
Virginia, 1998



The northern health planning region had the highest incidence rate (6.5 cases per 100,000 population), followed by the northwest (2.6 per 100,000), eastern (2.4 per 100,000), central (1.3 per 100,000) and southwest (0.7 per 100,000) regions.

Syphilis

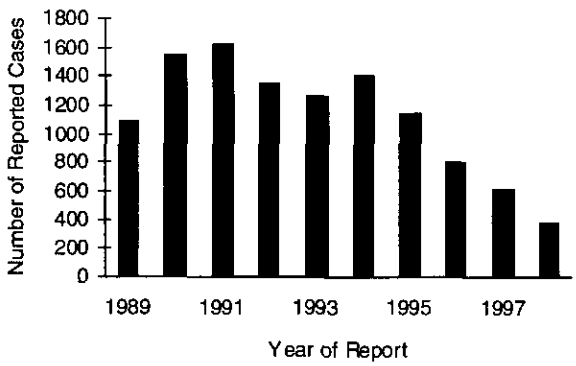
Early Syphilis

Early syphilis includes the primary, secondary and early latent stages of syphilis. The number of cases of early syphilis reported decreased 38%, from 615

cases in 1997 to 379 cases in 1998 (Figure 48), continuing a downward trend that began in 1995.

The 40-49 year age group had the highest incidence rate (14.2 cases per 100,000 population), followed by the 39-39 age group (12.0 per 100,000), the 20-29 year age group (11.3 per 100,000), the 10-19 age group (4.1 per 100,000), and the 50 year and older age group (1.3 per 100,000).

Figure 48
Early Syphilis: Ten Year Trend
Virginia, 1989-1998



Blacks were reported more frequently and had the highest incidence rate (337 cases, 25.1 per 100,000). The incidence rate for blacks was 50 times higher than the rate for whites (0.5 per 100,000) and six times higher than the rate for the other race category (4.4 per 100,000). Three reports did not indicate race.

The number of cases in females decreased 41%, from 302 cases in 1997 to 179 cases in 1998. The corresponding decrease in the number of cases in males was 36%, from 313 cases in 1997 to 200 cases in 1998 (Figure 49). The 1998 incidence rate per 100,000 population was 5.2 for females and 6.1 for males.

The eastern health planning region reported the most cases (167 cases, 9.6 per 100,000), followed by the central region (101 cases, 8.8 per 100,000), southwest region (73 cases, 5.8 per 100,000), northern region (27 cases, 1.6 per 100,000), and northwest region (11 cases, 1.2 per 100,000) as shown in Figure 50. Onset of disease was fairly evenly distributed throughout the year.

Figure 49
Early Syphilis: Cases by
Sex, Virginia, 1997-1998

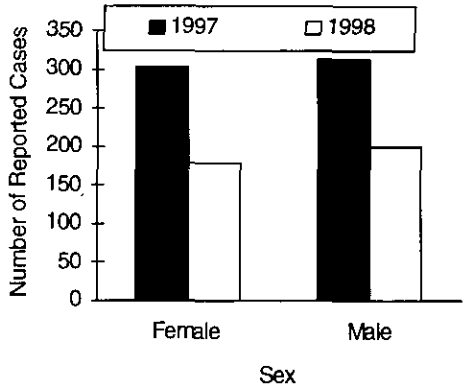
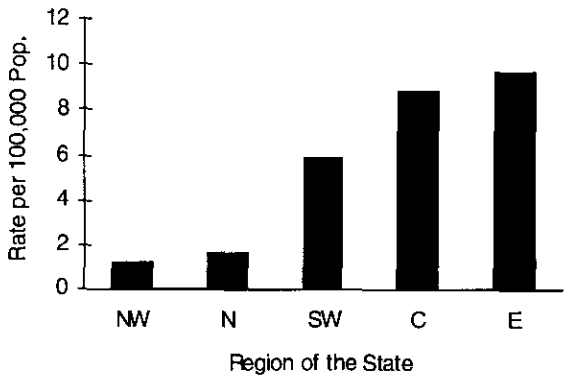


Figure 50
Early Syphilis: Rate by Region
Virginia, 1998



Congenital Syphilis

In 1998, five cases of congenital syphilis were reported. Four of the cases occurred in blacks and one was in whites. Three of the cases were reported from the eastern health planning region and two from the central region.

The mother's average age was 26 years, with a range of 22 to 29 years. Four mothers were single parents. Three sought prenatal care during their third trimester and two mothers did not receive prenatal care.

The five congenital syphilis cases in 1998 represented a 50% decrease from the ten cases reported in 1997. The decrease in early congenital syphilis may be associated with the 27% decrease in early syphilis among women from 1996 to 1997. Due to the nine-month gestation period, there is usually a lag between an increase or decrease in early syphilis and a corresponding change in congenital syphilis. It is expected, therefore, that congenital syphilis may continue to decrease in 1999, as there was a decrease in female early syphilis cases from 1997 to 1998.

Tetanus

One case of tetanus was reported in Virginia in 1998.

The case patient had no history of ever receiving tetanus toxoid. This was the first tetanus case reported in Virginia since 1994.

Toxic Shock Syndrome

No cases of toxic shock syndrome were reported in Virginia in 1998. One case had been reported in 1997.

Toxic Substance Related Illnesses

No illness in this category was reported in 1998 to the Office of Epidemiology.

Toxoplasmosis

No cases of toxoplasmosis were reported in 1998. Toxoplasmosis, a common protozoan infection in man and animals, is not a reportable disease in Virginia; however, cases are recorded when reports are received.

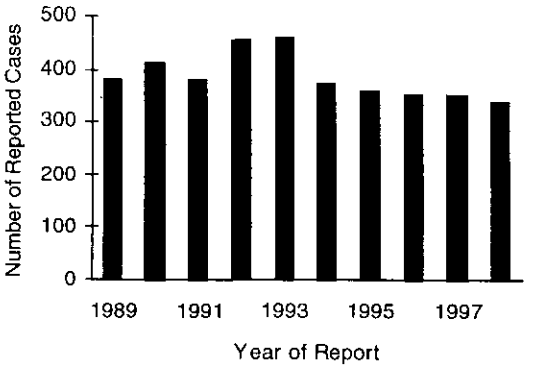
Trichinosis

The last case of trichinosis in Virginia occurred in 1993.

Tuberculosis

In 1998, 339 tuberculosis cases were reported, slightly less than the 349 cases reported in 1997. Twenty-three cases (7%) were reactivations of previously diagnosed and treated disease. The annual incidence rate for Virginia was 5.0 cases per 100,000 population, compared to 6.8 cases per 100,000 population for the nation. Figure 51 shows the ten year trend for tuberculosis in Virginia.

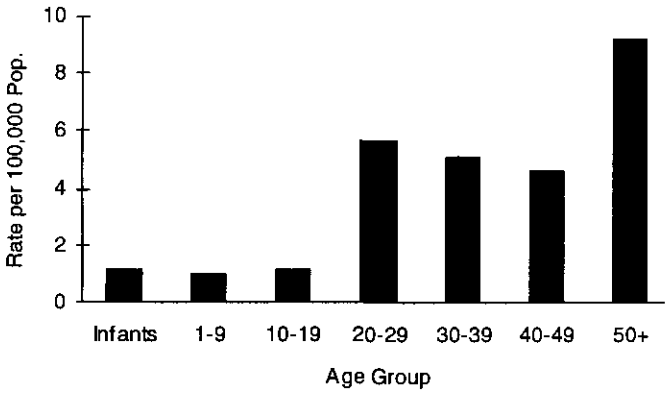
Figure 51
Tuberculosis: Ten Year Trend
Virginia, 1989-1998



Cases of tuberculosis occurred in all age groups. The largest number of cases and the highest incidence rate occurred in persons age 50 years and older (156 cases, 9.2 per 100,000 population). One case (1.1 per 100,000 population) occurred in an infant, and eight cases (1.0 per 100,000 population) occurred in children age 1-9 years (Figure 52). Persons in the other race category had the highest incidence rate (125 cases, 49.8 per 100,000 population),

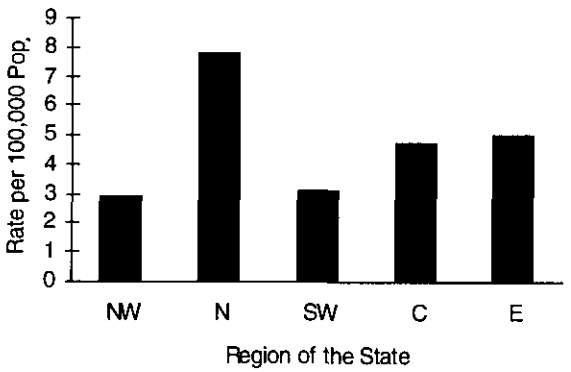
followed by blacks (130 cases, 9.7 per 100,000 population) and whites (84 cases, 1.6 per 100,000 population). Males were more likely to be reported with tuberculosis than females (190 cases, 5.8 per 100,000 population vs. 149 cases, 4.3 per 100,000 population).

Figure 52
Tuberculosis: Rate by Age Group
Virginia, 1998



The northern health planning region reported the highest number of cases (132 cases, 7.8 per 100,000 population), followed by the eastern region (87 cases, 5.0 per 100,000 population), as shown in Figure 53. Persons born in countries outside the United States accounted for 153 (45%) cases, 112 of whom were reported from the northern health planning region.

Figure 53
Tuberculosis: Rate by Region
Virginia, 1998



Of the 302 culture-confirmed cases, 295 (98%) had drug susceptibility testing performed. Of those isolates tested, 26 (9%) were resistant to at least one anti-tuberculosis medication. Nine (3%) were resistant to multiple drugs, of which seven were resistant to both isoniazid and streptomycin and one was resistant to both isoniazid and rifampin.

Sixty-seven percent of persons reported with tuberculosis were offered HIV testing; results were available for 200 persons, of whom 14 were HIV positive.

Thirty-seven (11%) persons reported with tuberculosis in 1998 died: 13 were diagnosed at death and 24 died during the course of their treatment.

Tularemia

Three cases of tularemia were reported in Virginia in 1998. The cases were all adult males and ranged in age from 40 to 50. The cases occurred during the summer months of July, August and September with no geographic clustering. One patient died with this disease.

Typhoid Fever

Seven cases of typhoid fever (*Salmonella typhi*) were reported in 1998 compared to five in 1997. The cases ranged in age from 11 months to 34 years (mean = 20 years). Four males and three females were reported.

Six of the seven cases had traveled to or lived in a developing country during the month preceding their onset of illness. No travel history was recorded for one case.

Five cases were reported from the northern health planning region, one from the central region and one from the eastern region.

Typhus, Flea-borne

The last reported case of flea-borne typhus in Virginia occurred in 1993.

Vibrio Infection

Thirteen cases of vibriosis were reported in 1998. *Vibrio parahaemolyticus* was the cause of four infections. Three infections were caused by *V. vulnificus* and two by *V. cholerae* non-01. *V. fluvialis, V. hollisae, V. mimicus and V. unspecified* each caused one infection. The site of infection or source of specimen collection was specified for twelve cases as follows: stool (6 cases); blood (3 cases); wound (2 cases) and urine (1 case).

All cases occurred between May and October with peak activity occurring in July. All thirteen persons were adults who ranged in age from 22 to 82 years (mean = 49 years). Ten cases were in whites, one was in the other race category, and race was recorded as unknown for two cases. Nine males and four females were reported.

The eastern health planning region reported nine cases, the central region reported two cases and the northwest and northern regions each reported one case.

Cholera

No cases of cholera were reported in Virginia in 1998. The last case was reported in 1994.

Waterborne Outbreaks

No waterborne outbreaks were reported in 1998.

Yersiniosis

Although not officially reportable in Virginia, twenty-seven reports of yersiniosis were received in 1998. Species was reported as *Yersinia enterocolitica* for 24 cases and not specified for the remaining three cases. Cases occurred more frequently during the first half of the reporting year.

The majority (67%) of the cases was reported in infants. Cases were fairly evenly distributed between females (14) and males (11). Gender was not reported for two cases. Race was reported as black for seven cases, white for five cases, and race unknown for the remaining 15 cases. Cases were distributed in all of the health planning regions with the southwest (11) and central (9) regions having the most cases.