DESCRIPTIVE EPIDEMIOLOGY OF

REPORTABLE DISEASES

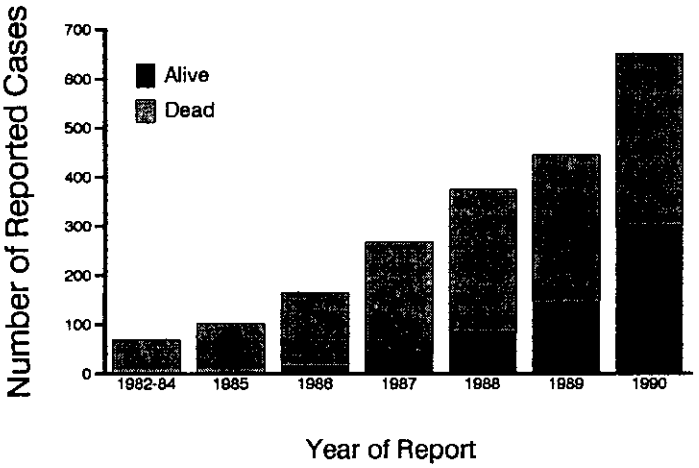
Acquired Immunodeficiency Syndrome (AIDS)

Since reporting began in 1982, the cumulative number of AIDS cases reported is 2,077 with 1,477 of these cases known to have died (71.1%). The annual number of cases continues to increase; in 1990, 650 cases were reported, representing a 46.1% increase over 1989. (Figure 1).

AIDS is caused by the human immunodeficiency virus (HIV). The most common modes of transmission are through unprotected sexual

Figure 1

Reported Cases of AIDS in Virginia by Year of Report and Vital Status

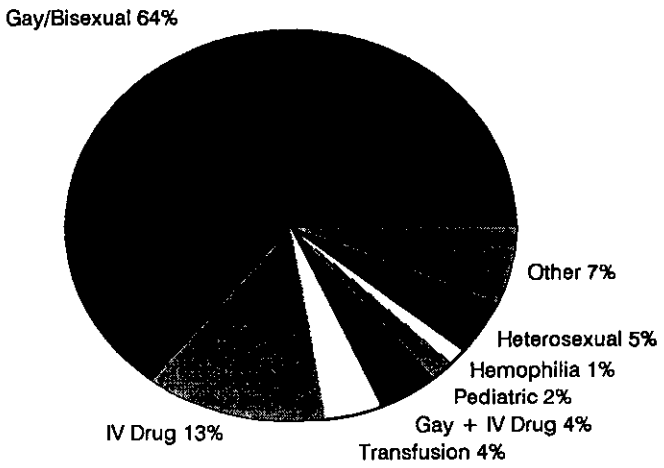


intercourse (especially anal intercourse) and intravenous (IV) drug use. During 1990, homosexual activity accounted for the greatest percentage of AIDS cases with 64.5%, followed by IV drug use (13.1%). An additional 4.3% of cases had both of the above risk factors. (Figure 2).

Most AIDS cases reported in 1990 were between the ages of 20 and 49 (575 cases, 88.5%). The age group with the highest case rate was the 30-39 age

Figure 2

AIDS: Mode of Transmission Virginia, 1990



group with 26.6 per 100,000. Twelve pediatric AIDS cases were reported in 1990. The majority of these children were infected via perinatal transmission (7 cases, 58%). Three children were infected through a blood transfusion, and one through blood products associated with hemophilia. No mode of transmission was identified for the remaining child.

During 1990, the majority of AIDS cases were white (360 cases, 55.4%). Nonwhites, however, were nearly 3 times more likely than whites to be affected by this disease, having a disease rate of 20.8 per 100,000 compared to 7.5 in whites. Males also represented a disproportionate share, with a disease rate 9 times higher than females (19.3 vs. 2.1 per 100,000)

All regions experienced an increase in reported AIDS morbidity in 1990 compared to 1989. Continuing to experience the highest morbidity rate was the northern section of the Northern Region (16.1 per 100,000), followed by the Central Region (12.7 per 100,000) and the Eastern Region (11.0 per 100,000). The northwest section of the

Northern Region and the Southwest Region each reported less than six cases per 100,000.

Persons with AIDS develop a variety of life-threatening opportunistic infections due to immunosuppression. The most commonly diagnosed infection is Pneumocystis carinii pneumonia (PCP). Over half (54.2%) of the cases reported during 1990 developed PCP during the course of their illness. Other frequently diagnosed conditions include Kaposi's sarcoma, HIV wasting syndrome, esophageal candidiasis, and HIV encephalopathy.

Amebiasis

Eighteen cases of amebiasis were reported in 1990, representing a 25% reduction compared to the previous year. Dates of onset clustered in the warmer months, with 67% of the cases occurring between May and August. (Figure 3).

Amebiasis was reported in children age 1-9 and in adults. No cases occurred in infants or in older children (age 10-19). Race was often unreported. For those cases for whom race was reported, none was white and eight were nonwhite. Cases were evenly divided between males and females.

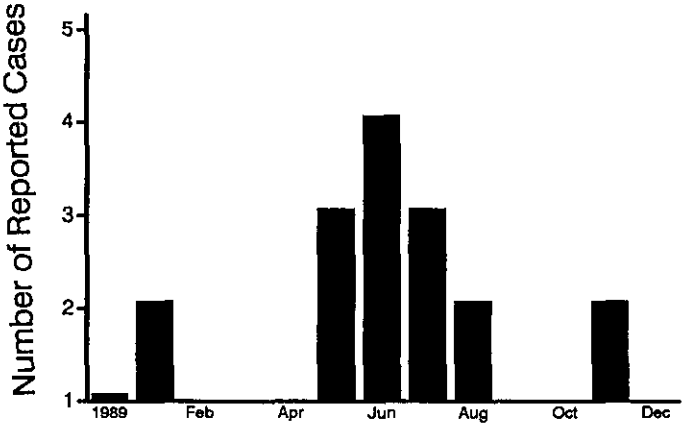
The Northern Region was the place of residence for eleven (61.1%) of the cases, including ten in the northern section of the Region. Only eight localities reported any cases of amebiasis.

Anthrax

No cases of anthrax were reported in 1990. The last time a case of anthrax was reported in Virginia was 1970.

Figure 3

Number of Cases of Amebiasis by Date of Onset, Virginia, 1990



Arboviral Infection

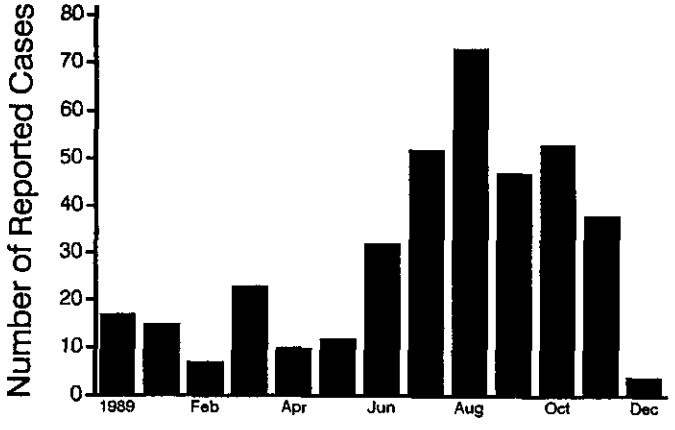
One confirmed arboviral infection was reported in 1990. This was a case of Eastern Equine Encephalitis in a 36 year old white male. He was a resident of Henrico County with an illness onset date in the month of September. He gave no history of travel outside of the state during the incubation period making this the first indigenous arboviral infection reported since 1977. The patient survived.

Aseptic Meningitis

Although the 386 cases of aseptic meningitis reported in 1990 is 31 less than the number reported in 1989, it is higher than the average number reported during the previous five years (327 cases). Onset of disease tended to occur in

Figure 4

Cases of Aseptic Meningitis by Date of Onset, Virginia, 1990



summer and fall, with a peak in August. (Figure 4).

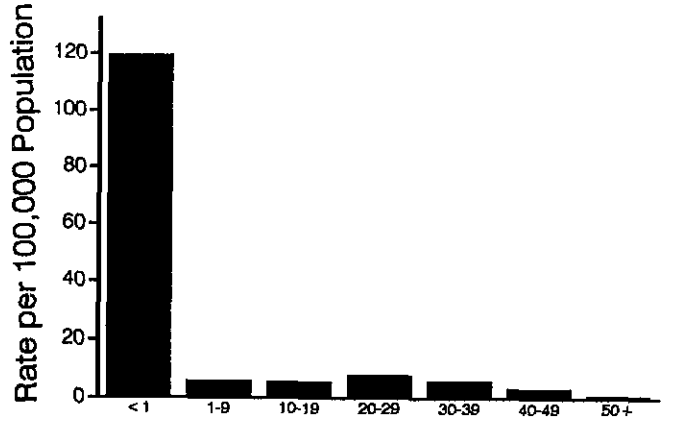
The disease rate was by far the highest for infants. (Figure 5). All other age groups had similar disease rates, ranging from 3.2 to 7.9 per 100,000, until a decline was seen in the oldest group. While 60% of the cases were white, the morbidity rate was higher in nonwhites (Table 5). Rates were similar for males (6.9) and females (5.6).

The northern section of the Northern Region had the highest rate of aseptic meningitis, followed by the Central and Eastern Regions, the northwest section of the Northern Region, and finally the Southwest Region. One young adult in the Northern Region died of aseptic meningitis.

The type of virus was reported for nine cases. Five were unspecified enterovirus, three echo virus, and one coxsackie B virus.

Figure 5

Aseptic Meningitis: Rate by Age Virginia, 1990

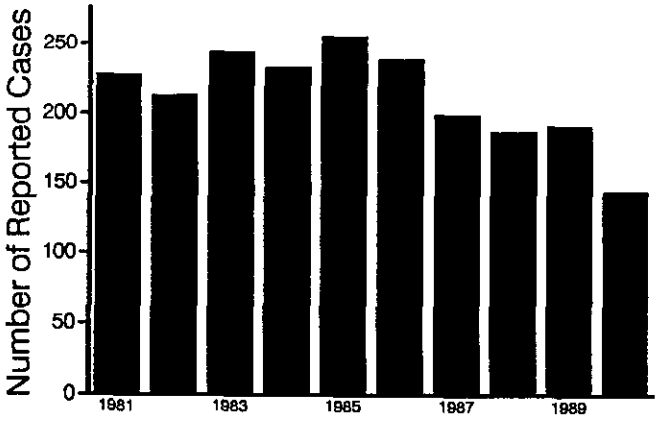


Bacterial Meningitis

The number of reported cases of bacterial meningitis continued to decline in 1990 to 144 cases. The ten year trend for this disease is shown in Figure 6. The most commonly reported types

Figure 6

Bacterial Meningitis: Ten Year Trend Virginia, 1981-1990



were H. influenzae (41 cases, 28.5%) and pneumococcal (39 cases, 27.1%), as presented in Table 8. Twenty persons with bacterial meningitis died. The type with the highest case fatality ratio was pneumococcal. Fourteen of the 39 cases of pneumococcal meningitis (36%) died.

Cases occurred throughout the year. The month with the most cases was March, when 21 cases were reported to have had onset of disease. As with aseptic meningitis, infants had the highest rate of bacterial meningitis (84.3 per 100,000). The morbidity rate dropped to 3.8 for young children, was less than one per 100,000 in older children and young adults and increased slightly in the two adult age groups (Table 4). Five of the persons who died were infants, five were age 30-45, and ten were over age 60. Whites represented a larger proportion of cases, but the morbidity rate was twice as high in nonwhites.

Table 8. Etiology of Bacterial Meningitis Cases Reported in Virginia, 1990

Organism	Number of Cases	Percent of Cases
Enterococcus	5	3.47
Eschericia coli	6	4.17
Haemophilus influenzae	41	28.47
Klebsiella pneumoniae	1	0.69
Listeria monocytogenes	7	4.86
Staphylococcus:		
S. aureus	2	1.39
S. epidermidis	1	0.69
Streptococcus:		
Group A	4	2.78
Group B	13	9.03
Group D	1	0.69
S. pneumoniae	39	27.08
S. sanguis	1	0.69
unspecified	3	2.08
Unspecified	19	13.19
TOTAL	144	100.00

Morbidity rates were very similar for males (2.4) and females (2.2).

The Southwest Region reported the highest rate of bacterial meningitis (3.1), closely followed by the Eastern Region and the northwest section of the Northern Region (both 3.0). Morbidity rates in the Central Region and northern section of the Northern Region were less than half that of the other areas.

Botulism

One case of infant botulism was reported from the Southwest Region with onset in November of 1989.

Brucellosis

Two cases of brucellosis, both from the Eastern Region, were reported in 1990. Both cases were adults. One was white, and one nonwhite. One was male, one female.

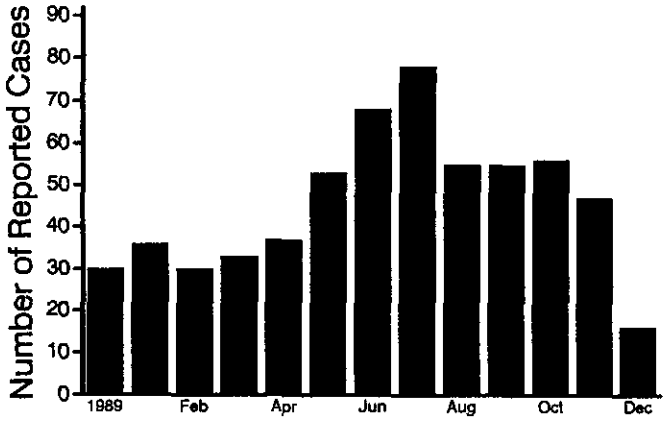
Campylobacteriosis

The 598 cases of Campylobacter infection reported in 1990 is the lowest number reported since 1986 (Table 2). Cases occurred throughout the year, with a peak occurring in June (68 cases) and July (78 cases). (Figure 7).

Species was not reported for over one-third of the cases. C. jejuni caused 362 (60.5%) of the cases. C. fetus and C. coli each were responsible for ten cases.

Figure 7

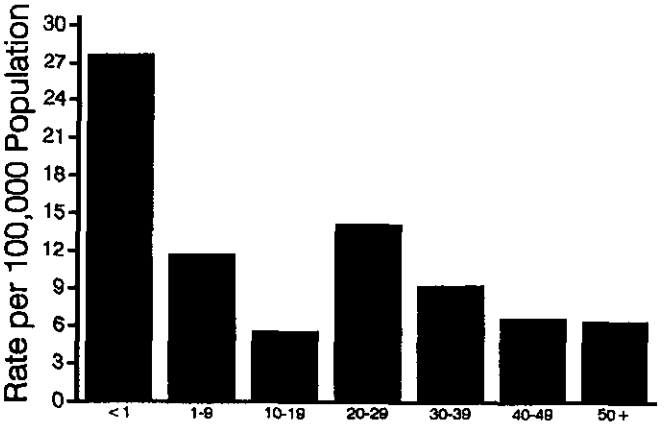
Cases of Campylobacteriosis by Date of Onset, Virginia, 1990



The highest rate of cases was found in infants (22 cases, 27.7 per 100,000), followed by 20-29 year olds (155 cases, 14.2 per 100,000). (Figure 8). The rate in whites (5.7) was higher than in nonwhites (3.7). Males experienced slightly more campylobacteriosis (10.3) than females (8.6 per 100,000). One elderly man died due to this infection.

Figure 8

Campylobacteriosis: Rate by Age Virginia, 1990



The Northern Region had the highest morbidity rate of all regions (12.6 per 100,000). The rate in the northwest section was nearly twice as high as that in the northern section of the Northern Region (17.8 vs. 9.6). Disease rates in the other areas were as follows: Central Region 11.1, Southwest 8.7, and Eastern 5.3 per 100,000 population.

Chancroid

Five cases of chancroid were reported in 1990, which is half the number reported in 1989. Four were male and one was female.

Chickenpox

The 2,677 reports of chickenpox were 23% less than the 3,492 cases reported in 1989, but 51% higher than the ten year mean. The Eastern Region reported the most cases (70%) followed by the northwest section of the Northern Region (13%), the Southwest Region (11%) and the northern section of the Northern Region and the Central Region (3% each).

Cases were reported throughout the year, with 82% reported during the first half of the calendar year. More cases were reported in June (742 cases) than the following six months.

One death due to chickenpox was reported in a 28 year old white female from the Eastern Region.

Chlamydia Trachomatis Infection

During 1990, 13,391 cases of Chlamydia trachomatis infection were reported. Twenty-seven percent of the cases were white (3,619, 75.5 cases/100,000), 53% nonwhite (7,055, 505.5 cases/100,000), and 20% of the cases were race unspecified. The majority of the cases (87%) were between the ages of 10-29 with forty-six percent of the cases in the 10-19 age category (6,126, 731.8 cases/100,000). (Figure 9).

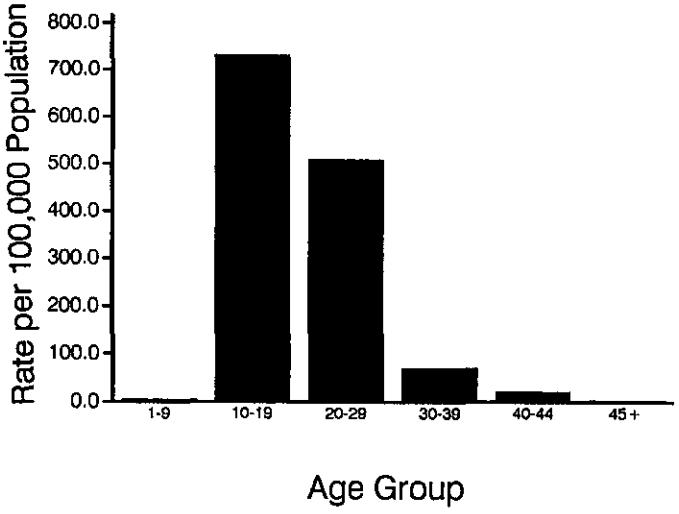
The data are expected to be an underestimate of the incidence of C. trachomatis infections because (1) screening has been limited to high risk females attending Sexually Transmitted Disease (STD), family planning or prenatal clinics, (2) as many as 75% of women and 25% of men with uncomplicated C. trachomatis infections are asymptomatic, and (3) persons with gonorrhea presumptively treated for C. trachomatis are not included in the case counts. The Centers for Disease Control estimates the morbidity due to C. trachomatis to be twice that of gonorrhea. By using this method, approximately 32,000 C. trachomatis infections are expected in Virginia each year.

The policy of restricting C. trachomatis screening to high risk females has resulted in a male to female ratio of .05 to 1.

Figure 9

Chlamydia trachomatis: Rate by Age

Virginia, 1990



Congenital Rubella Syndrome

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

Diphtheria

No cases of diphtheria were reported in 1990. One was reported the previous year.

Ehrlichiosis, Human

Although not an officially reportable disease, three cases of ehrlichiosis in humans were reported in 1990. The cases included two white males and one white female. Onset of illness occurred between the months of May and September. One case each was reported from the Southwest, Central and Eastern Regions.

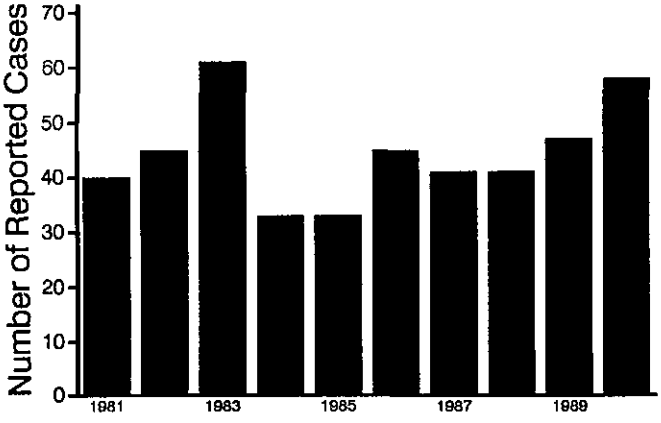
Encephalitis, Primary

The 58 cases of primary encephalitis reported in 1990 is the most reported since 1983 (Figure 10). Twenty-one cases were reported to be of viral origin, including four specified as herpesvirus and one each cytomegalovirus, Epstein Barr virus, and EEE virus. The latter is discussed in the Arboviral Infection section. Ten cases were due to Toxoplasma, all of whom died. In all, 24 persons died of encephalitis in 1990.

Figure 10

Primary Encephalitis: Ten Year Trend

Virginia, 1981-1990



Cases occurred throughout the year, without any apparent seasonality. Ten of the cases reported in 1990 had onset in 1989. The month with the greatest number of cases was October 1990, in which six cases occurred.

Although the most cases (19 cases) occurred in persons age 50 and older, infants had the highest morbidity rate of any age group (2.5 per 100,000). The rate in infants, however, was based on only two cases. The morbidity rate in nonwhites was 0.9, compared to 0.7 in whites, Race was not reported for twelve cases. Males experienced a slightly higher rate of disease (1.1) than females (0.8).

The Southwest and Central Regions reported a morbidity rate of 0.5 per 100,000. The Northern and Eastern Regions had rates of 1.2 per 100,000.

Encephalitis, Post-Infectious

One case of post-infectious encephalitis was reported this year. The encephalitis followed a case of chickenpox in a resident of the Northern Region.

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.

Seven cases of Fifth disease were reported in 1990. Six of the cases were white females ranging from age 6-36. The remaining case was a one year old white male.

Four of the cases were from the Northern Region and three were from the Eastern Region. There were no deaths reported.

Foodborne Outbreaks

Ten foodborne outbreaks were reported in 1990 and are summarized in Table 9. The number of

persons becoming ill per outbreak ranged from three to 197. The etiologic agent was most often a bacterium, however, in three instances a virus was suspected.

An outbreak occurred in each of the regions, with the most (4) occurring in the Northern Region. Six of the ten outbreaks occurred between the months of June and July. Improper storage or holding temperature was the leading factor contributing to foodborne outbreaks.

Fungal Diseases

Fungal diseases other than histoplasmosis are not officially reportable in Virginia. However, selected fungal diseases are recorded when reported. In 1990, reported fungal diseases other than histoplasmosis included 40 cases of cryptococcosis (including 27 reports of cryptococcal meningitis), two cases of coccidioidomycosis and one case of blastomycosis.

Giardiasis

The 359 cases of giardiasis reported in 1990 represent the most reported in any year of this decade (Figure 11). Onset occurred throughout the year, with onset slightly weighted toward September through November (Figure 12).

The morbidity rate was highest for young children (17.1 per 100,000), followed by infants (6.3). The rate for older children and adults was five per 100,000 population or less (Table 4). Nonwhites were more likely than whites (5.7 vs 3.4 per 100,000) to be reported with giardiasis. No sex difference was observed. The Northern Region had the highest morbidity rate (7.5 per 100,000).

Figure 11

Ten Year Trend of Giardiasis

Virginia, 1981-1990

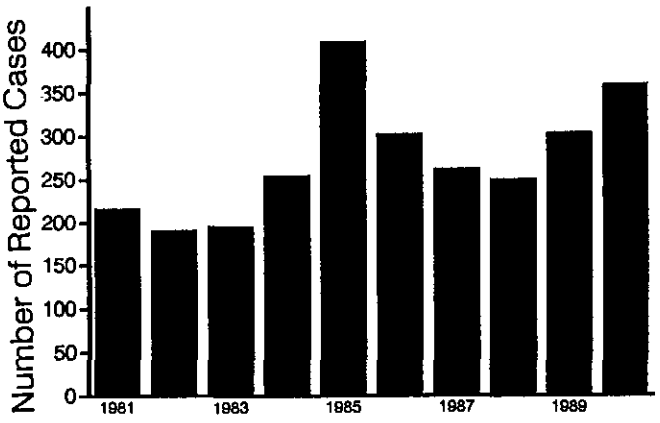
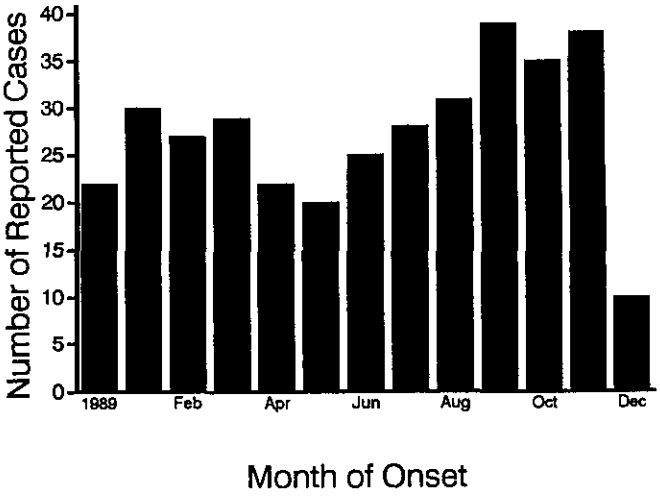


Figure 12

Number of Cases of Giardiasis

by Date of Onset, Virginia, 1990



Gonorrhea

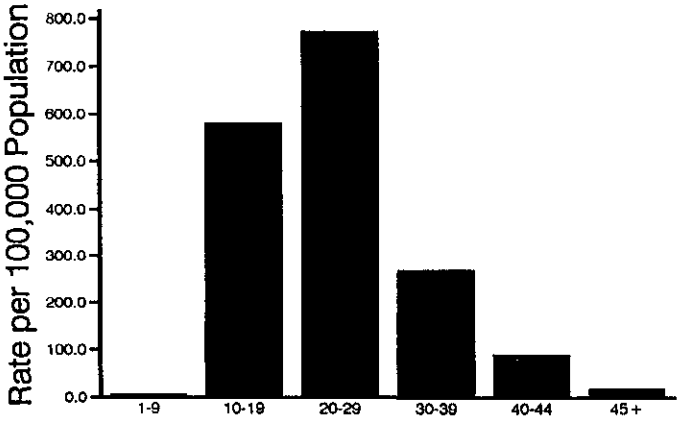
Gonorrhea continues to be the most frequently reported disease in Virginia. In 1990, 17,652 cases of gonorrhea were reported in Virginia. This 10.4% increase from 1989 is a second consecutive year of double digit increases in incidence following a decade of decreasing morbidity.

Nearly three-quarters (74.2%) of all gonorrhea in Virginia occurred in the 15-29 (13,089) age group, with the highest rate (773.6 per 100,000) occurring in the 20-29 age group. Persons age 10-19 had a gonorrhea rate of 582.3 per 100,000. (Figure 13).

Figure 13

Gonorrhea: Rate by Age Group

Virginia, 1990



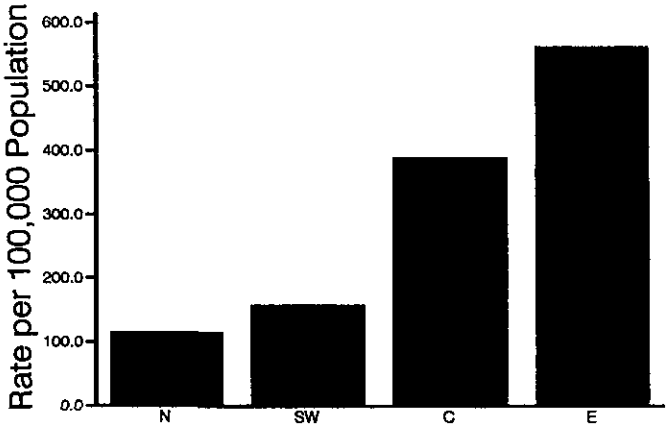
Seven percent of the cases were white (1,206, 25.2 per 100,000), 82% were nonwhite (14,407, 1032.3 per 100,000) and 12% were race unspecified (2,039). The male to female ratio was 1.5 to 1.

The Eastern Region reported the most cases (8,893, 563.4 per 100,000), followed by the Central (4,136, 389.3 per 100,000), Southwest (1,973, 158.5 per 100,000), northern section of the Northern

Figure 14

Gonorrhea: Rate by Region

Virginia, 1990



Region (1,879, 128.1 per 100,000), and the northwest section of the Northern Region (771, 92.3 per 100,000). (Figure 14).

Penicillinase-Producing Neisseria Gonorrhoeae (PPNG)

The incidence of PPNG remains hyperendemic in Virginia, increasing to 7.5% of the state's gonorrhea morbidity. The 1,319 cases of PPNG reported represent a 14% increase over 1989.

The 14% increase observed from 1989 to 1990 was far less than the 111% increase experienced between 1988 and 1989. It is believed that implementing a treatment regimen of ceftriaxone

for treating gonorrhea has limited the spread of this resistant form of gonorrhea.

The male to female ratio was 1.7:1.

The Eastern Region reported the most cases (776/59%) followed by the northern section of the Northern Region (321/24%), the Central Region (138/11%), the northwest section of the Northern Region (47/4%), and the Southwest Region (37/3%).

Granuloma Inguinale

Two cases of granuloma inguinale were reported in 1990, compared to one in 1989.

Haemophilus Influenzae Infection, Invasive

This was the second year in which these infections were officially reportable. Invasive H. influenzae infections include infections of the blood, joint fluid, lung tissue, pericardium, and peritoneum. Meningitis caused by H. influenzae is included under the heading Bacterial Meningitis.

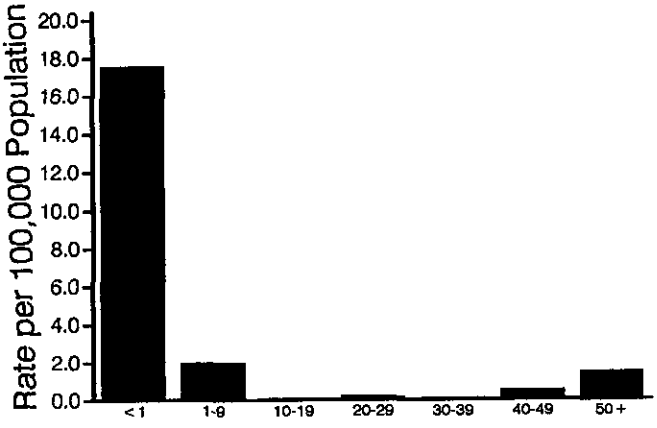
Sixty cases of invasive H. influenzae infection were reported in 1990, compared to 50 in 1989. Cases occurred throughout the year, as presented in Table 7.

Cases clustered in the youngest and oldest age groups (Figure 15). Infants were the most likely age group to be reported with H. influenzae infections (17.6 per 100,000), followed by 1-9 year olds (2.0) and persons age 50 and older (1.5).

Figure 15

Invasive H.influenzae Rate by Age

Virginia, 1990



Morbidity rates in the other age groups were very low.

Rates of infection were very similar in the two race groups and the two sex groups. Morbidity rates by region ranged from 0.5 in the Southwest Region to 1.3 in the Eastern Region.

One death due to an invasive H. influenzae infection occurred in an adult in the Eastern Region.

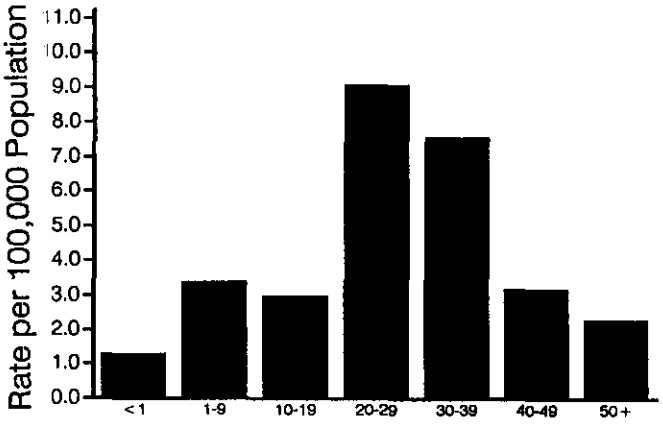
Hepatitis A

Reports of hepatitis A (302 cases) were lower than they have been for the last two years, but still higher than the ten-year average of 220.5 cases. Cases occurred throughout the year, with a peak of 50 cases with onset in August and 41 in April. Only 8% of the cases had onset in the fourth quarter.

Figure 16

Rate of Hepatitis A by Age Group

Virginia, 1990



Young adults age 20-39 were at the most risk for hepatitis A. Their morbidity rates were two to three times higher than those for children and older adults (Figure 16). Nonwhites were somewhat more likely than whites (5.1 vs. 4.0 per 100,000) to be reported with this disease. The morbidity rate was also higher for males (5.9) than females (3.9). (Figure 17).

The Eastern Region reported the most cases and had the highest rate of all regions (112 cases, 7.1 per 100,000). The other three regions reported 3.0 (Northern) to 5.3 (Southwest) cases of hepatitis A per 100,000 population. An outbreak of hepatitis A in Clifton Forge yielded a morbidity rate of 598.4 per 100,000 population in that city.

Hepatitis B

The number of reports of hepatitis B received continued to decline in 1990. Two hundred seventy-nine cases were reported, compared to an average of 478.2 cases per year during the previous nine years (Figure 18). No seasonal trend was observed in the dates of onset of the cases.

Figure 17

Rate of Hepatitis A by Sex

Virginia, 1990

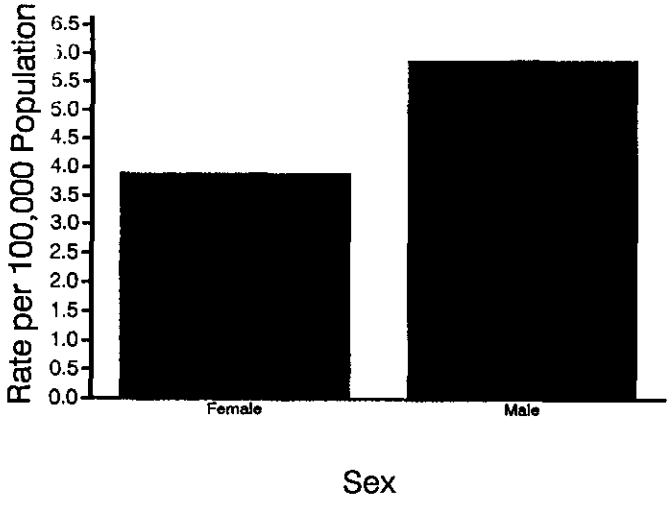


Figure 18

Ten Year Trend of Hepatitis B

Virginia, 1981-1990

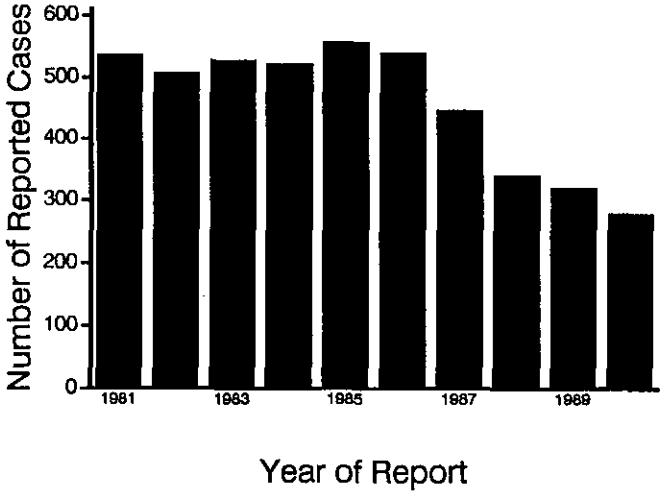


Figure 19

Rate of Hepatitis B by Race Group Virginia, 1990

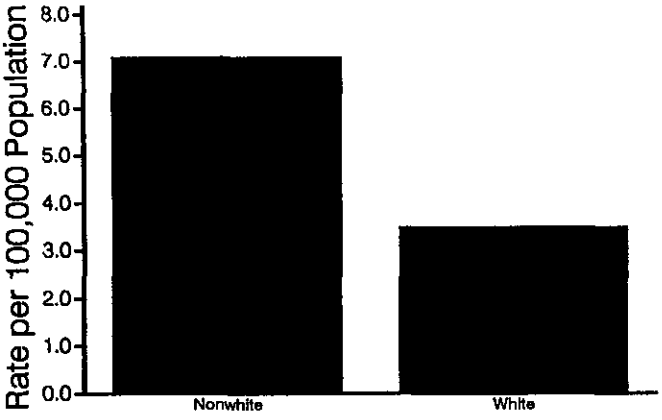
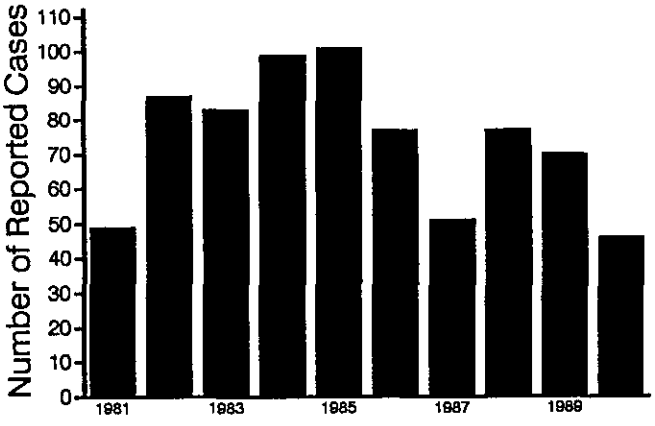


Figure 20

Hepatitis Non-A Non-B: Ten Year Trend, Virginia, 1981-1990



Young adults were at the greatest risk of disease, with a morbidity rate of 9.6 for 20-29 year olds and 7.2 for the 30-39 age group. Rates in the other groups were half that or less. The rate in nonwhites was twice that of whites (7.1 vs 3.5 per 100,000). (Figure 19). Males were also at a higher risk of hepatitis B than females (5.8 vs 3.3 cases per 100,000).

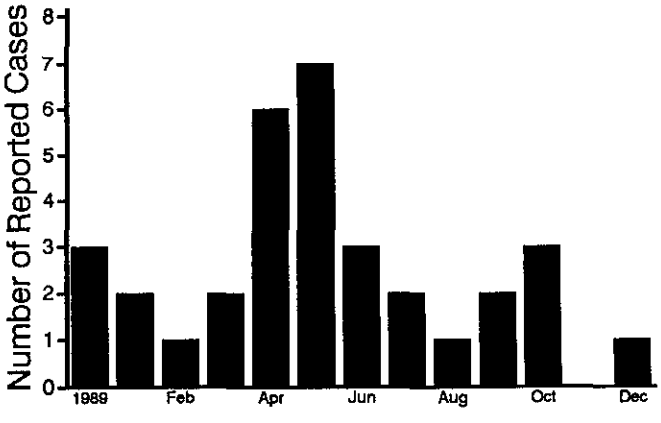
Rates by region ranged from 3.3 per 100,000 in the Northern Region to 5.7 in the Central Region. Nine persons died of hepatitis B, ranging in age from 26 to 90, with an average age of 54.1 years.

Hepatitis Non-A Non-B

Forty-six cases of this disease were reported in 1990, the fewest reported in any of the past ten years (Figure 20). Over one-third of the cases experienced onset during the second quarter of the year. The months in which the most cases occurred were April (6 cases) and May (7 cases). (Figure 21).

Figure 21

Cases of Hepatitis Non-A Non-B by Date of Onset, Virginia, 1990



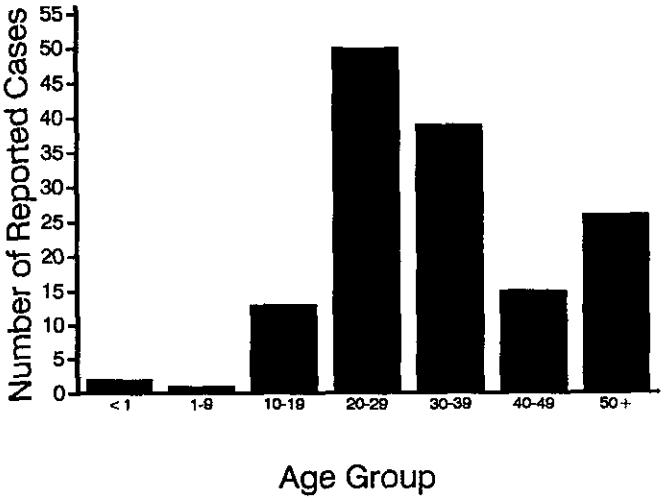
Persons age 50 and older were the most likely to be reported with hepatitis non-A non-B (1.7 per 100,000). The next most frequently affected age group was infants. However, the rate of 1.3 per 100,000 was based on only one case in that age group. Whites were at greater risk (0.8 per 100,000) than nonwhites (0.6). The rate in females (1.0) was twice as high as the rate in males (0.5).

Morbidity rates by region ranged from 0.6 per 100,000 population in the Central Region to 1.0 in the Eastern Region. The rates in the Northern and Southwest Regions were 0.7 and 0.8, respectively.

Eleven of the cases died. Ten of the 11 were white. Nine were over age 65. The average age of the persons with hepatitis non-A non-B who died was 68.4 years.

Figure 22

Cases of Hepatitis Unspecified by Age, Virginia, 1990



Hepatitis Unspecified

One hundred forty-eight cases of viral hepatitis unspecified were reported in 1990. The month with the largest number of cases was January. Cases occurred consistently throughout the first three quarters of the year. Only seven cases had onset during the fourth quarter.

The age group with the most cases was 20-29 year olds (50 cases), followed by 30-39 year olds (39 cases). (Figure 22). The number of cases in the two race groups was almost the same, 62 whites and 63 nonwhites. More cases were male (95 cases) than female (53 cases).

Almost one-half of the cases were from the Eastern Region (69 cases, 46.6%). The other regions each reported 25 or fewer cases. Two persons with hepatitis unspecified died.

Histoplasmosis

Reported cases of histoplasmosis dropped from 11 in 1989 to six in 1990. Three of the cases had onset in November. All persons with histoplasmosis were adults age 30 or older; three were age 60 or older. All six were male. Two cases were from the northwest section of the Northern Region; two from the Southwest Region; and two from the Eastern Region.

Human Immunodeficiency Virus (HIV) Infection

In July of 1989, HIV infection became officially reportable in Virginia. Trends associated with HIV will continue to evolve as more data is collected. Already, differences are evident

between AIDS and HIV statistics. Given the long incubation period of HIV, these trends will most likely be a predictor of future AIDS trends.

During 1990, 1,142 HIV infections were reported bringing the cumulative total to 1,388.

Although males represented the majority of those reported (77.6%), females comprised 22.4% of HIV infections, more than twice the percentage of female AIDS cases (10.0%). During 1990, the majority of persons with HIV infection were nonwhite (739 cases, 64.7%) while whites represented 31.6% of the HIV infections (361 cases). Nonwhites were 7 times more likely than whites to be infected, having a disease rate of 53.0 per 100,000 compared to 7.5 in whites. (Figure 23).

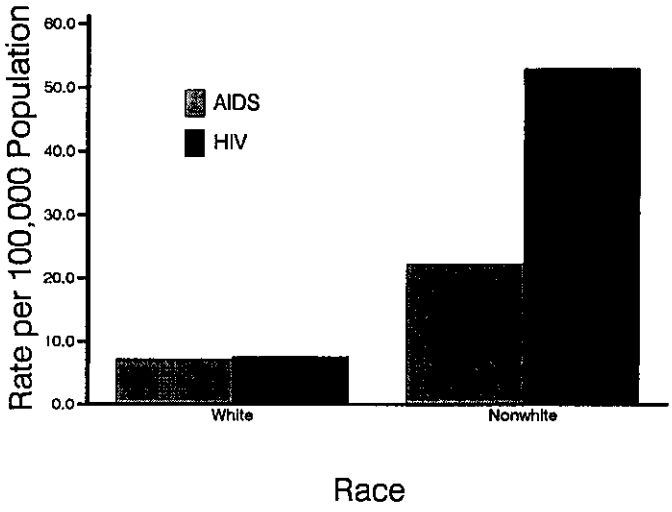
As stated above, by comparing AIDS cases with HIV infections there are more females and nonwhites. These populations are also demonstrating different modes of transmission from the AIDS profile which is predominantly gay, white, and male. The most notable change in transmission between AIDS and HIV is the decrease in the percentage of cases attributed to gay and bisexual activities and corresponding increases in heterosexual and multiple heterosexual contact modes of transmission.

The screening of blood and blood products for HIV began in March of 1985. This screening was expected to reduce the number of new cases attributed to blood or blood products. A comparison of the percentage of cumulative AIDS cases to HIV infections which are due to blood transfusions or blood products associated with hemophilia (5.8% vs. 2.1%) provides evidence that such a reduction has occurred.

The majority of the HIV infections are between the ages of 20 and 39 (909 infections, 80%). The 20-29 and 30-39 age groups reported nearly the same number of infections (458 and 451

Figure 23

A Comparison of AIDS and HIV Infections by Race, Virginia, 1990



respectively) and have respective case rates of 41.9 and 41.6 cases per 100,000. Three pediatric HIV infections were reported in 1990. These children were infected through a blood transfusion or blood products associated with hemophilia.

The region with the highest morbidity rate was the Eastern Region (35.0 per 100,000), followed by the Central Region (20.1 per 100,000) and the northern section of the Northern Region (18.5 per 100,000). The northwest section of the Northern Region and the Southwest Region each reported less than seven cases per 100,000.

Influenza

The 937 cases of influenza is the lowest number reported since 1985 when 1,007 cases were reported and represent a 55.55% decrease from the 2,108 cases reported in 1989. Seventy percent (657 cases) were reported during the months of January and February (308 cases and 349 cases,

respectively). Case rates ranged from a high of 26 per 100,000 in the Southwest Region to a low of one case per 100,000 in the northern section of the Northern Region.

Jakob-Creutzfeldt Disease

Four cases of this disease, which is not officially reportable, were reported in 1990. Three cases were male and one was female. One case was reported from each of the four regions. All four died.

Kawasaki Syndrome

Twenty-four reported cases of Kawasaki syndrome were confirmed in 1990, consistent with the 23 counted in 1989. From 1981 through 1990, between 14 and 39 cases have been reported each year, with an average of 24.1 cases per year.

Five cases occurred in March and 5 in May. Four persons experienced disease onset in August. Between zero and three cases were reported in the other months. No cases had onset during the fourth quarter of the year.

Twenty-three of the cases (95.8%) were in the 1-9 age group, for a morbidity rate of 2.9 per 100,000. One case was an infant. Although more cases were white, the rate in nonwhites was 0.7 per 100,000, more than twice the rate of 0.3 in whites. The rate in males (0.5) was slightly higher than in females (0.3).

The Eastern Region had the highest morbidity rate of all regions (0.6), followed by the Northern Region (0.5). The northern section of the Northern Region had a rate three times as high as the northwest section (0.6 vs 0.2).

Legionellosis

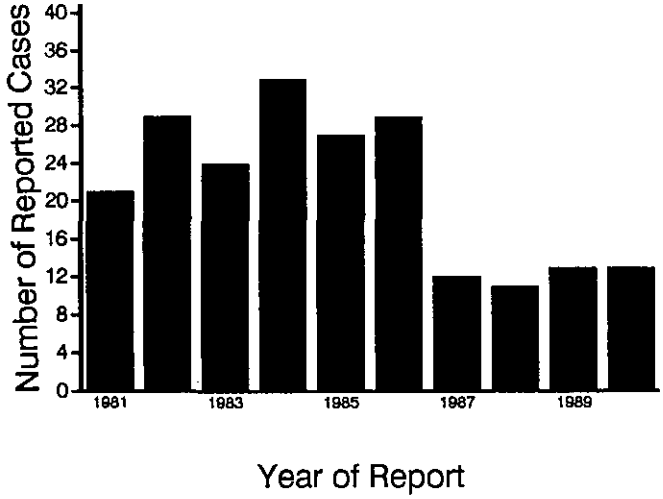
The same number of cases of legionellosis were reported in 1989 and 1990 (13 cases). The average number of cases reported per year from 1981 through 1986 was 27.2. That number declined to 12.3 from 1987 through 1990 (Figure 24).

Four cases reported in 1990 had onset in 1989, two had onset during the first quarter, four during the second, and three during the third. No cases occurred during the fourth quarter. All cases were age 30 or older. Eight (61.5%) were age 50 or older, for a rate of 0.6 per 100,000 in that age group. All twelve cases whose race was reported were white. Males were at greater risk of legionellosis (0.3 per 100,000) than females (0.2).

Figure 24

Ten Year Trend of Legionellosis

Virginia, 1981-1990



The region with the most cases was the Southwest Region (5 cases, 0.4 per 100,000). The rate in the Northern Region was 0.2 and 0.1 in both the Central and Eastern Regions.

Two persons with legionellosis, both over the age of 70, died.

Leprosy

The last reported case of leprosy in Virginia occurred in 1986.

Leptospirosis

One case of leptospirosis was reported in 1990. The person was a young adult from the Eastern Region.

Listeriosis

Eighteen cases of listeriosis were reported in 1990, more than twice the number (7 cases) reported the previous year. Meningitis caused by Listeria is included in the Bacterial Meningitis section.

Five cases occurred during each of the first, third, and fourth quarters of the year. Only one was reported to have onset during the second quarter, and one during 1989. Two cases were infants, the rest were adults age 25 or older. Nine (50%) were age 60 or older. Race was not reported for half the cases. Of the remainder, seven were white and two were black. Eleven cases were male, compared to seven female. Six cases lived in the Northern Region, five in the Southwest and Eastern Regions, and two in the Central Region.

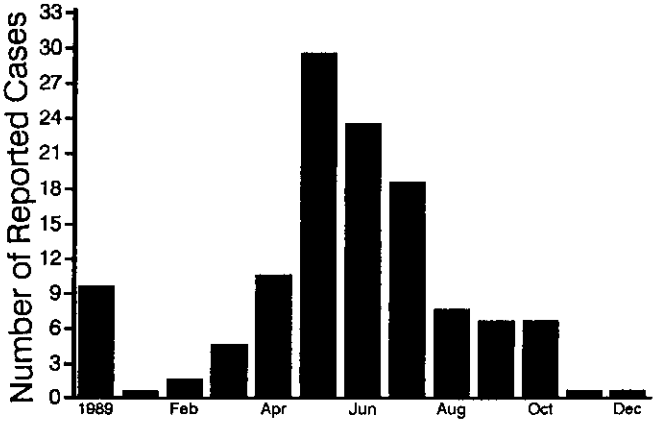
One elderly person from the Central Region died of listeriosis.

Lyme Disease

The frequency of confirmed reports of Lyme disease more than doubled between 1989 and 1990; 54 cases were tallied in 1989 and 129 in 1990. Lyme disease was not officially reportable prior to 1989.

Figure 25

Number of Cases of Lyme Disease by Date of Onset, Virginia, 1990



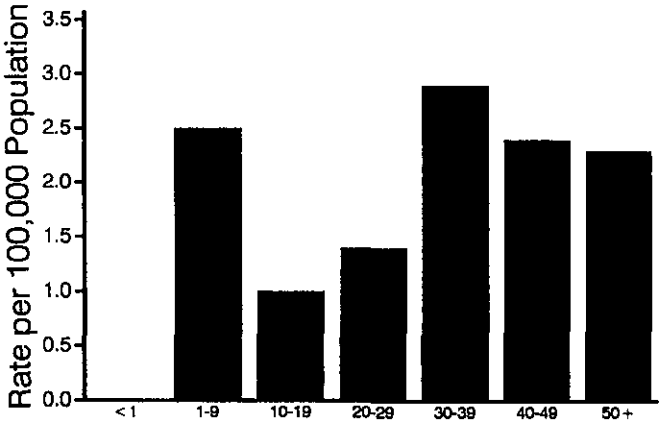
Onset peaked in May, when 30 cases occurred. An additional 24 had onset in June. In all, 50% of the cases experienced onset during the second quarter of the year (Figure 25). Except for infants, all age groups were affected by Lyme disease. Rates by age ranged from 1.0 in 10-19 year olds to 2.9 in 30-39 year olds. Four of the six age groups

in which cases occurred had a morbidity rate between 2.3 and 2.9 per 100,000 (Figure 26). Whites were six times more likely to be reported with Lyme disease than nonwhites (2.4 vs 0.4 per 100,000). The morbidity rates were the same for males and females.

Figure 26

Lyme Disease Rate by Age Group

Virginia, 1990



The Eastern Region reported nearly two-thirds of all cases (82 cases, 5.2 per 100,000). The rate in the Northern Region was 1.3 per 100,000, with the rate in the northwest section more than twice as high as in the northern section. Morbidity rates in the Central and Southwest Regions were 1.0 or less. Accomack County, Nelson County, and Williamsburg had Lyme disease rates over 50 per 100,000.

Lymphogranuluma Venereum

Two cases of lymphogranuloma venereum were reported. This is the same number of cases reported in 1989.

Malaria

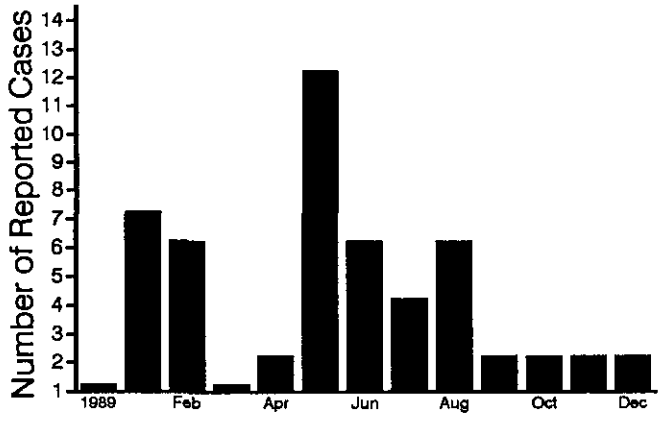
More cases of malaria were reported in 1990 than in any of the past ten years (Table 2). Fifty-four cases were reported, compared to an average of 33 cases per year during the previous nine years.

The month during which the most cases occurred was May (12 cases). One-third of the cases experienced onset during the second quarter (Figure 27). The age group at greatest risk of malaria was 20-29 year olds (1.5 per 100,000). The rate was also high in infants (1.3), but that was based on only one case. Nonwhites were at much

Figure 27

Number of Cases of Malaria

by Date of Onset, Virginia, 1990

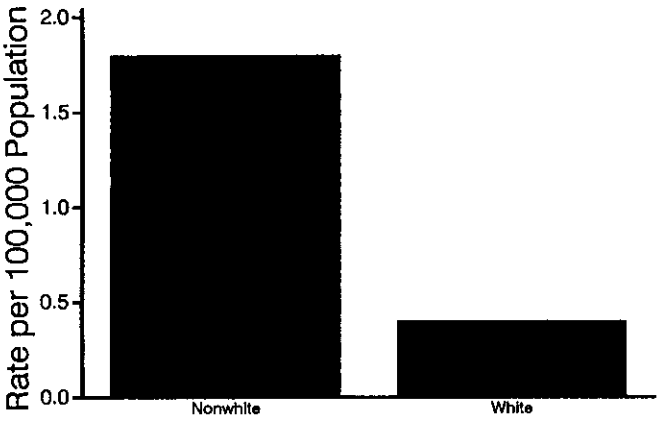


greater risk of disease (1.8 per 100,000) than whites (0.4). (Figure 28). The rate in males (1.2) was more than twice that of females (0.5).

Figure 28

Rate of Malaria by Race Group

Virginia, 1990



The Northern Region had by far the most malaria (1.95 per 100,000). The rate in the northern section of the Northern Region was 3.1, compared to zero in the northwest section. The Central, Southwest, and Eastern Regions reported less than 0.4 cases per 100,000 population.

The species of Plasmodium was specified for 46 cases. P. vivax caused 21 cases (38.9%), P. falciparum 20 (37.0%), and P. malariae 5 (9.3%).

Thirty-three reports included a country of origin. Ten had a history of travel to an African country, nine to India, six to Central America, three to Pakistan, two to South America, two to North America (one U.S., one Mexico), and one to Afghanistan. Only six reports stated that the case had received prophylaxis.

Measles

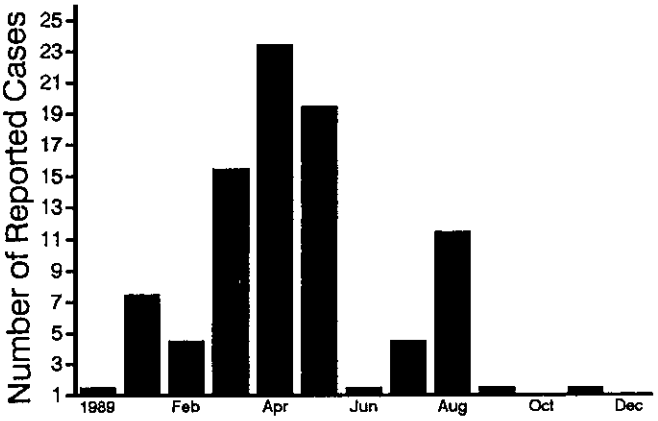
Reports of measles totalled 86 in 1990, compared to 22 in 1989 and 239 in 1988. Two cases were imported and 84 indigenous.

The peak of onset occurred in April, when 23 cases were reported. An additional 19 cases experienced onset in May. Half of the cases occurred in the second quarter of the year (Figure 29).

Figure 29

Number of Cases of Measles

by Date of Onset, Virginia, 1990



Infants had the highest morbidity rate (15.1 per 100,000, 12 cases), followed by children age 1-9 (4.3 per 100,000, 34 cases) and children age 10-19 (2.0 per 100,000, 17 cases). No cases were age 50 or older (Table 4). Whites were at greater risk of disease (1.2 per 100,000) than nonwhites (0.6). Cases were fairly evenly divided between the sexes: female 46 cases, male 40 cases.

The Northern Region reported the most cases (54 cases, 2.4 per 100,000). Most cases in that Region were from the northern section (45 cases, 3.1 per 100,000). Rates in the Central and Eastern Regions were 1.4 and 1.1, respectively. The Southwest Region was free of measles in 1990.

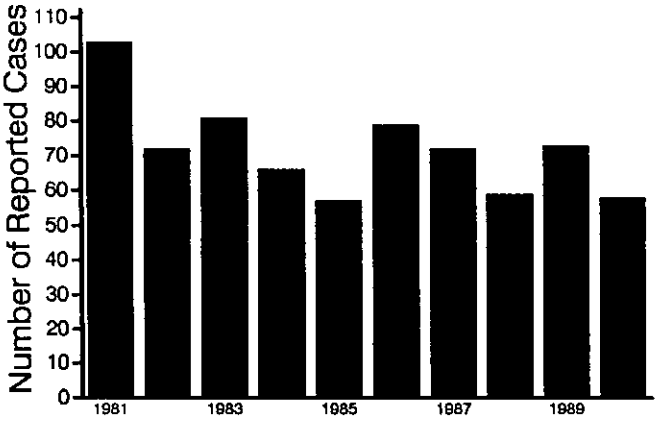
One outbreak of measles was reported in 1990. The outbreak, which resulted in 26 cases, occurred in the spring at a college campus in Hanover County. The index case was a student who returned to campus after being exposed off campus.

Meningococcal Infection

Fifty-eight cases of meningococcal infection were reported in 1990. This represents a decline in morbidity, given that the average number of cases reported per year during the previous nine years was 73.6 (Figure 30).

Figure 30

Meningococcal Infections: Ten Year Trend, Virginia, 1981-1990



Ten cases experienced onset in January. An average of 4.2 cases occurred during each of the other months of the year, with a range of two to six cases per month.

The age group at highest risk of meningococcal infections was infants (15 cases, 18.9 per 100,000). The rate in each of the other age groups was less than two per 100,000 population. Whites and nonwhites were at almost equal risk. Males were nearly twice as likely as females to be reported (1.2 vs 0.7 per 100,000).

Very little difference was apparent in morbidity rates by region. These rates ranged from 0.9 in the Northern and Eastern Regions to 1.1 in the Southwest.

Twenty cases (34.5%) were specified as Group B, eight as Group C, two as Group Y, and one as W-135. Four persons died, all of whom were age 6 or younger.

Mumps

The number of cases of mumps reported in 1990 (108 cases) was lower than the number reported during the previous two years, but higher than the number reported from 1982 through 1987. Incidence of this disease in Virginia appears to have been lower throughout most of the 1980's and then to have increased during the last three years.

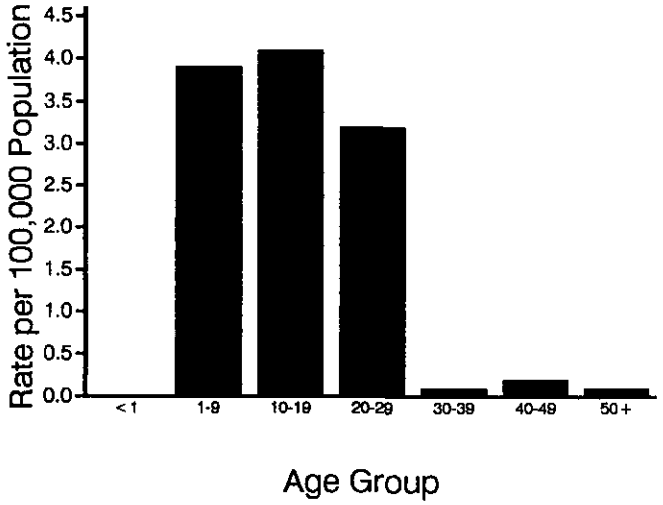
Onset of disease peaked in April, with 26 cases. Almost one-half of the cases (51 cases, 47.2%) occurred during the second quarter of the year. Children and young adults were at greatest risk of disease. No cases occurred in infants, and only five were reported to be age 30 or older (Figure 31). Morbidity rates were the same for the two

race groups. Males were somewhat more likely than females to be reported with mumps (2.0 vs 1.5 per 100,000).

Figure 31

Rate of Mumps by Age Group

Virginia, 1990



The Northern Region reported the most cases (68 cases, 3.0 per 100,000), followed by the Eastern Region (25 cases, 1.6 per 100,000). The Southwest and Central Regions reported nine and six cases, respectively.

Nosocomial Outbreaks

Four nosocomial outbreaks were reported in 1990, as summarized in Table 10. Two outbreaks were caused by Staphylococcus aureus, one by Clostridium difficile, and one by an unknown agent. Type of illness included "flu-like" symptoms, diarrhea, and post-operation wound infections. No deaths occurred.

Occupational Illnesses

Sixty-nine reports of occupational illnesses were received in 1990. Of those 63 (91.3%) were asbestosis, two carpal tunnel syndrome, and one each chlorine exposure, hydrochloric acid fume

Table 10. Nosocomial Outbreaks in Virginia, 1990

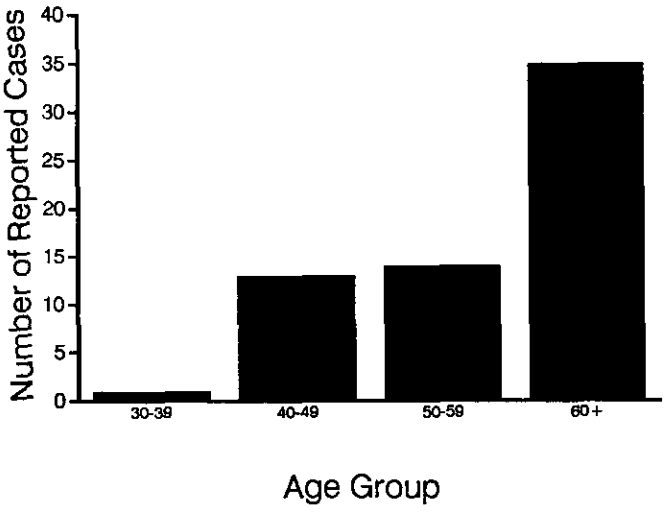
Locality	Type of Illness	Onset Date of Index Case	Number of Cases	Etiologic Agent	Comments
Williamsburg	flu-like	3/1/90	23	unknown	Fever of 100+ degrees Fahrenheit with at least one respiratory symptom: cough, coryza or sore throat.
Newport News	unknown	4/5/90	10	S. aureus	Methicillin resistant S. aureus (MRSA) on skilled care unit.
Rockingham Co.	diarrhea	5/30/90	6	C. difficile	Outbreak occurred among patients of a hospital's extended care facility.
Frederick Co., Winchester	post-operation wound infections	6/2/89 (reported 3/90)	23	S. aureus	Hospital personnel colonized with S. aureus were identified and treated.

exposure, paint thinner reaction, and allergy to red cedar.

Figure 32

Cases of Asbestosis by Age Group

Virginia, 1990



The 63 cases of asbestosis represent a 70.3% decrease compared to the 212 reported in 1989. The risk of asbestosis increased with age throughout the years of employment, as shown in Figure 32. The age group with the most cases was persons in their sixties (23 cases, 35.5%).

A large majority of cases were male (61 cases, 96.8%) and white (54 cases, 85.5%). The Eastern Region accounted for 50 cases (79.4%) and the Central Region for 11 cases. Two cases resided out-of-state.

The industry employing the most persons with asbestosis was shipbuilding (35 cases, 55.6%), followed by the textile industry (12 cases, 19.4%). Other industries reported four or fewer cases each. The occupations of persons with asbestosis included pipefitters (11 cases), insulators (7 cases), welders (5 cases), boilermakers (5 cases), electricians (4 cases), and sheetmetal workers (4 cases), among a variety of others.

Ophthalmia Neonatorum

One case of ophthalmia neonatorum was reported in 1990.

Other Meningitis

Seventy-five cases of meningitis caused by unspecified organism or other than bacteria or viruses were reported in 1990. Reports of cryptococcal meningitis accounted for 27 (36%) of the cases, carcinomatous six (8.9%) and unspecified 42 (56%). Of the 33 deaths reported, 12 were due to cryptococcal meningitis, six to carcinomatous meningitis and 15 to an unspecified meningitis.

Parasites, Intestinal

In addition to giardiasis and amebiasis, selected reports of other parasitic intestinal diseases are recorded. In 1990, these include 82 cases of ascariasis (roundworm), 82 cases of hookworm, 51 cases of trichuriasis (whipworm), 21 cases of strongyloides, and one case of cryptosporidiosis. Ninety-six percent of the cases were reported from the Central (90 cases), Eastern (80 cases), and Southwest (56 cases) Regions.

The majority of the cases (198 cases, 83.5%) were of the "other" race group. The male to female ratio was 1.4 to 1. Cases occurred throughout the year, but peaked in the fall

(September-October-November) with 88 cases (37%).

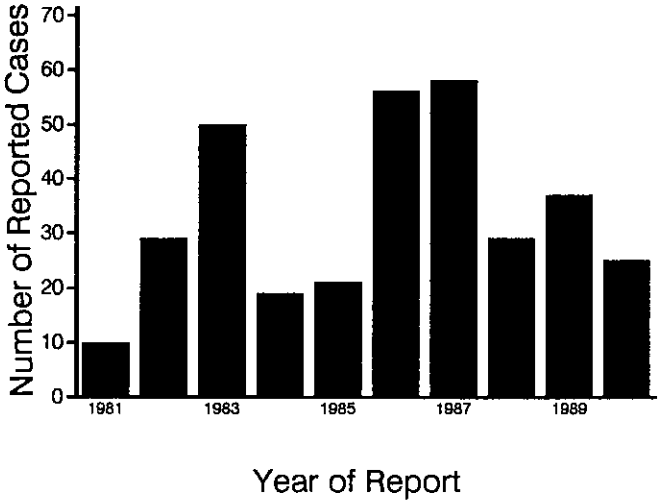
Pertussis

The number of cases of pertussis dropped to 25 in 1990. This is the lowest incidence of this disease observed since 1985 (Figure 33). Onset of disease ranged between zero and five cases each month. The peak of five cases occurred in July. No cases had onset during the fourth quarter of the year.

Figure 33

Ten Year Trend of Pertussis

Virginia, 1981-1990



Only three cases were reported to be age 10 or older. Infants were at the greatest risk of pertussis (10.1 per 100,000 based on 8 cases). Nine cases were age 1-9, for a rate of 1.1 per 100,000. Race was not reported for 21 (84%) of the cases. Females were more likely to be reported (0.5 per 100,000) than males (0.3)

The Central Region was free of pertussis in 1990. In the other regions, the disease rate ranged from 0.2 in the Eastern Region to 0.5 in the Northern and 0.8 in the Southwest.

Phenylketonuria (PKU)

Three infants were identified as having PKU through newborn screening programs in 1990. The same number had been reported the previous year.

Plague

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

Poliomyelitis

The last reported case of poliomyelitis occurred in 1978.

Psittacosis

Two confirmed cases of psittacosis were reported in 1990, compared to six in the previous year. Both cases were females in their thirties. Each had been exposed to ill pet birds prior to their diagnosis.

Q Fever

No cases of Q fever have been reported in Virginia since 1987.

Rabies in Animals

The total number of laboratory confirmed rabid animals for 1990 was 202. This was a 23% decrease from the 262 rabid animals reported in 1989. Despite the overall decrease in rabid animals, the raccoon rabies outbreak continued its geographic expansion. Five counties or cities reported rabid raccoons for the first time in 1990; Brunswick, Colonial Heights, Lunenburg, Mathews, and Surry.

For the eighth year in a row, raccoons were the most commonly reported rabid species. The 129 rabid raccoons accounted for 63% of all rabid animals (Figure 34). Of the 42 (21%) skunks reported, 10 (12%) were from five counties in the skunk rabies endemic area of southwest Virginia. The other rabid skunks were from the raccoon outbreak area. Although many of these animals probably acquired their illness as a result of "spillover" from rabid raccoons, there is evidence that rabies has become established in some skunk populations. During 1990 the counties of Augusta, Frederick, Lunenburg, and Page reported more rabid skunks than raccoons, a total of 22 skunks and only 7 raccoons.

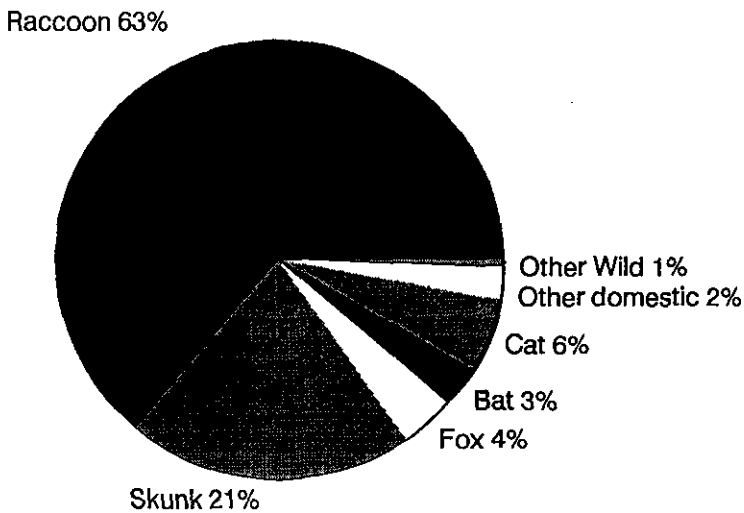
Other wildlife reported as rabid in 1990 included eight foxes, six bats, and one bobcat. In 1989 more foxes (15) and bats (14) were reported, as well as three opossums, one groundhog and one beaver.

In 1990, 7.4% of the 2730 animals that were tested for rabies were positive. The most commonly tested animals were cats (30%), dogs (17%), and raccoons (15%). This represented an increase in the proportion of dogs tested and a decrease in the proportion of raccoons compared to 1989. Although skunks only accounted for 3% of the animals tested, 52% of these were rabid. The proportion of tested raccoons with rabies was 32% while 1% of the cats and less than 1% of the dogs were positive.

Figure 34

Species of Animals Positive for Rabies

Virginia, 1990

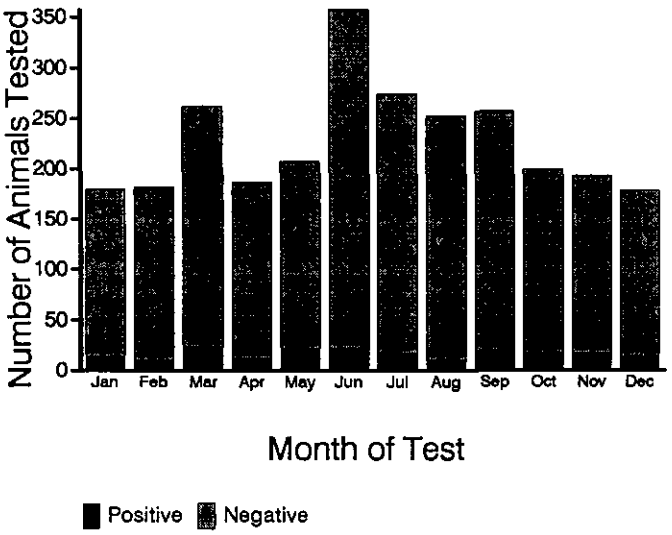


Eleven percent of the animals tested came from Prince William County, 8% from Fairfax, and 5% respectively from Chesterfield and Loudoun. The rest of the localities contributed between 0 and 3% of the animals tested. The number of animals tested is compared to the number positive for each month in Figure 35.

Human exposure was reported for 92% of the cats, 97% of the dogs, 31% of the bats, 35% of the raccoons, 27% of the foxes, and 11% of the skunks that were tested.

Figure 35

Animal Rabies Tests by Month and Test Result, Virginia, 1990



Rabies in Man

No human rabies cases were reported in 1990. The last reported case occurred in 1953. Administration of post-exposure prophylaxis was reported for 250 people and pre-exposure for 1,058.

Reye Syndrome

One case of Reye syndrome was reported in 1990. This person was in his twenties. He did not survive.

Rocky Mountain Spotted Fever

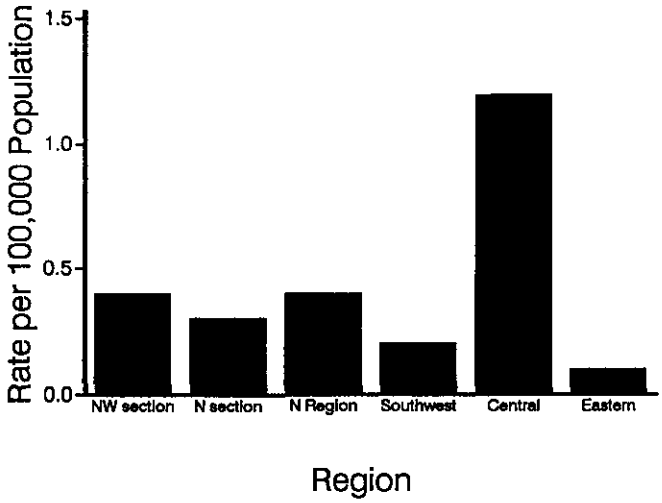
Twenty-five of the 46 reports of Rocky Mountain spotted fever were confirmed this year. This is the most cases confirmed since 1986, but less than the average number counted per year for the previous nine years (46.4 cases). Onset occurred during the second and third quarters of the year, with the most cases seen in June (8 cases).

Half of the cases were age 40 or older. Infants and young children were at low risk for the disease (one case). Whites were twice as likely as nonwhites to be reported (0.5 vs 0.2 per 100,000). Males were at greater risk than females (0.5 vs 0.3 per 100,000).

The Central Region reported the most cases (13 cases, 1.2 per 100,000), followed by the Northern Region (0.4 per 100,000). The morbidity rate was less than 0.2 for the other two regions (Figure 36).

Figure 36

Rocky Mountain Spotted Fever by Region, Virginia, 1990



Nineteen cases were confirmed using an IFA test. Eight reported having a rash. Nine cases reported a history of a tick bite and five had been in a tick infested area.

Two cases died. One was a teenager. The other was elderly.

Rubella

One case of rubella was reported in 1990. This person was a teenager from the Eastern Region.

Salmonellosis

The 1,491 cases of salmonellosis reported in 1990 is similar to the incidence observed in the previous year (1,452 cases). The most frequently reported species are displayed in Table 11. Newcomers to this list compared to 1989, include S. braenderup, S. montevideo, and S. saint paul. Species which have been removed from this list since last year are S. infantis, S. arizona, and S. muenchen.

Onset of salmonellosis tended to occur during the warmer months. Forty percent of the cases had symptoms between July and September (Figure 37). Cases were reported in each age group. Young children and older persons experienced the most morbidity. The rate was highest in infants, who were responsible for 196 cases (246.6 per 100,000).

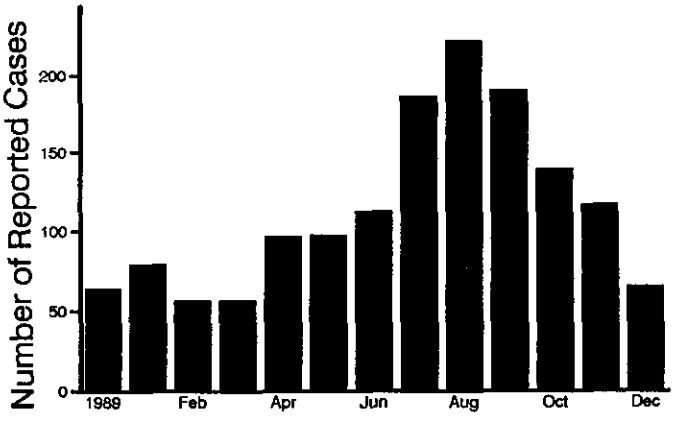
Nonwhites (19.2 per 100,000) were more likely than whites (11.8 per 100,000) to be reported as having salmonellosis. The rate was the same for males and females.

Table 11. Number and Percent of Salmonella Infections by Species, Virginia, 1990

Species Causing Infection	Number of Cases	Percent of Cases
S. typhimurium	391	26.22
S. enteritidis	303	20.32
S. heidelburg	94	6.30
S. newport	81	5.43
S. hadar	64	4.29
S. thompson	23	1.54
S. agona	22	1.48
S. braenderup	21	1.41
S. berta	15	1.01
S. montevideo	15	1.01
S. saint-paul	15	1.01
Unspecified	262	17.57
All Others	185	12.41
TOTAL	1491	100.00

Figure 37

Number of Cases of Salmonellosis by Date of Onset, Virginia, 1990



The Central Region reported the most morbidity (35.4 per 100,000), followed by the Northern Region (23.7), the Eastern Region (23.4), and then the Southwest Region (16.1).

Shigellosis

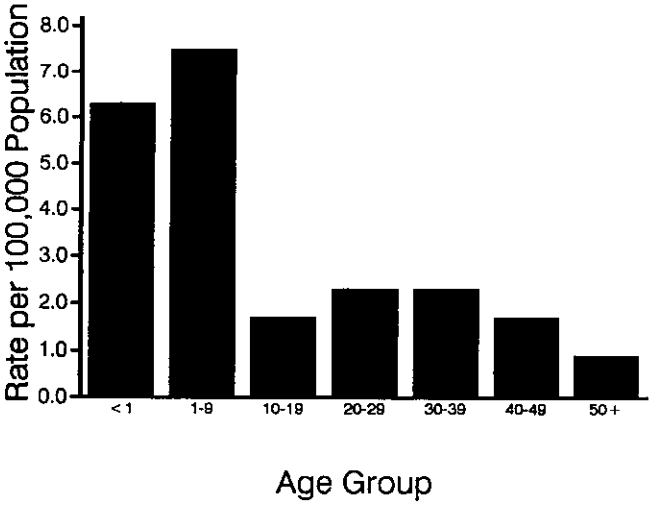
The frequency of reports of shigellosis declined to 158 in 1990 from 410 in 1989 and 497 in 1988. Species was reported for 138 of the cases. S. sonnei caused 105 (66.5%) cases, S. flexneri 30 (19.0%) cases, S. boydii 2 cases and S. dysenteriae one case.

Cases occurred throughout the year, but onset tended to increase during the summer months. Over one-third of the cases occurred during the third quarter of the year. Children age 1-9 were responsible for more cases than any other age group (59 cases, 7.5 per 100,000). Infants were also at increased risk for shigellosis (6.3 per 100,000). (Figure 38). Race was often unreported. Of those reported, however, nonwhites were more likely than whites to have this disease. Risk was similar for females (2.8 per 100,000) and males (2.2).

Figure 38

Rate of Shigellosis by Age Group

Virginia, 1990



Rates of shigellosis were highest in the Northern Region (3.8 per 100,000), especially in the northern section of that region (4.6). Rates in the other regions ranged from 2.2 per 100,000 (Eastern Region) to 1.5 (Southwest Region).

Smallpox

The last reported case of smallpox in Virginia occurred in 1944.

Syphilis

Early Syphilis

Primary, secondary, and early latent syphilis increased 42.6% from 1,088 cases in 1989 to 1,551 cases in 1990. This is the third consecutive year that the number of early syphilis cases has increased, reversing a downward trend observed in the early 1980's (Figure 39).

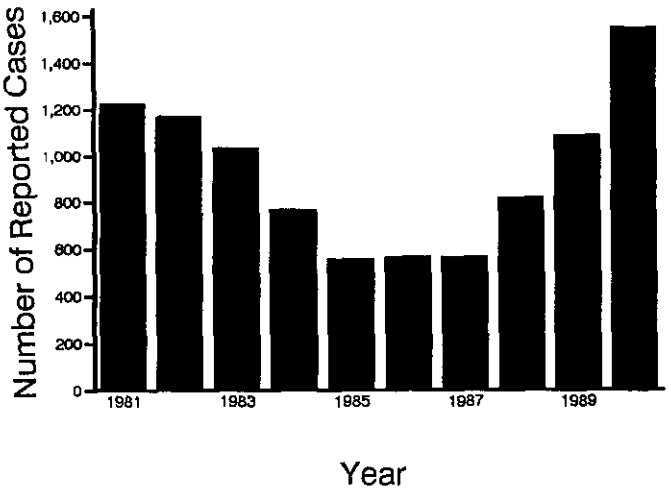
The majority of early syphilis cases (75%) were between the ages of 20-34, with nearly half (47%) of the morbidity found in the 20-29 age group (733, 67.0 cases per 100,000). Eight percent of the cases were white (128, 2.7 cases/100,000), and 92% nonwhite (1,421, 101.8 cases/100,000) and less than one percent unknown race.

The number of female cases increased 53% from 505 cases in 1989 to 772 cases (24.5 cases/100,000)

Figure 39

Syphilis, early: 10 Year Trend

Virginia, 1981-1990



in 1990. The corresponding increase in males was 34% from 581 cases in 1989 to 779 cases (25.7 cases/100,000) in 1990. The male to female ratio was 1:1.

The Central Region reported the most cases (670, 63.1 per 100,000), followed by the Eastern Region (414, 26.2 per 100,000), northern section of the Northern Region (249, 17.0 per 100,000, Southwest Region (156, 12.5 per 100,000), and northwest section of the Northern Region (62, 7.4 per 100,000).

Congenital Syphilis

In 1990 there were 25 cases of early congenital syphilis; 11 in the Northern Region, 8 in the Eastern Region and 6 in the Central Region. Nineteen of the infants were black, four were Hispanic and two were other/unknown race. Four of the infants were born with clinical signs and seven were still-births.

The mothers' average age was 24 (ranging from 17-33). Seventeen were single (68%). The date of the first doctor's appointment is known for sixteen of the seventeen mothers who received prenatal care. Two sought prenatal care during their first trimester, eight during the second trimester, and six during the third trimester. Seven cases of congenital syphilis might have been prevented if the mother had received a third trimester test for syphilis.

The 25 cases in 1990 represent a 92% increase over the 13 cases reported in 1989. The increase in early congenital syphilis is a reflection of the high incidence of early syphilis in women of childbearing age. Due to the nine month gestation period, there is usually a lag that exists between increases of early syphilis and early congenital syphilis. The 53% increase in the number of early syphilis cases experienced by females in 1990 can be expected to result in a greater number of early congenital syphilis cases for 1991.

In March of 1990, the Virginia Board of Health enacted a regulation requiring physicians to examine and test high risk pregnant women for syphilis at the beginning of the third trimester. It is hoped that compliance with this regulation, combined with increased disease surveillance and intervention activities, will prevent new cases.

Tetanus

Two cases of tetanus were reported this year. Both were females in the 50+ age group. One died.

Toxic Shock Syndrome

Three cases of toxic shock syndrome were confirmed in 1990. The cases were all white, age 30-49. Two were female and one male.

Toxic Substance Related Illness

No toxic substance related illness was reported in 1990.

Toxoplasmosis

Toxoplasmosis is a common protozoan infection in man and animals. While infections may be subclincal, infection can cause significant disease and is often fatal in the immunocompromised patient.

Seven cases of toxoplasmosis were reported in 1990 compared to four cases the previous year. Encephalitis due to Toxoplasma is included in the Encephalitis, primary section. Five cases were reported from the Northern Region, and one case each was reported from the Central and Eastern Regions. All but one of the cases were males. The age range was 29-79 with a mean age of 43. All seven of the cases died. Toxoplasmosis is not officially reportable in Virginia.

Trichinosis

Reports of trichinosis totalled 16 in 1990, compared to zero during the previous two years. All cases were from the northwest section of the Northern Region. All were adults age 30 or older. All for whom race was reported were white. Ten were female and six male.

This cluster of cases was included in an article in the February 1, 1991 issue of the Morbidity and Mortality Weekly Report (Vol. 40, No. 4). Fourteen cases reported eating pork sausage prior to disease onset, ten of whom ate the sausage raw. One case who did not eat undercooked sausage was employed as a meat handler in the sausage processing plant.

Tuberculosis

The number of cases of tuberculosis reported in Virginia totalled 410 in 1990, for a case rate of 6.6 per 100,000 population. This represents an increase of 7.9% over 1989 and reverses a downward trend observed since 1987. Nationally, the case rate was 10.3 per 100,000 and the number of cases increased 9.4% between 1989 and 1990.

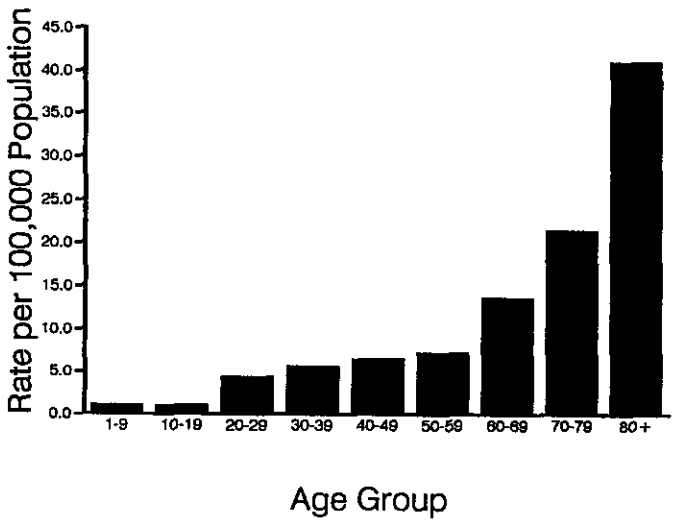
The age group with the highest morbidity rate was the fifty and older group (15.5 per 100,000). Figure 40 illustrates the number of tuberculosis cases reported by age group. Note that the 50+ group is subdivided into 50-59, 60-69, 70-79, and 80+ in this figure.

Nonwhites were more than five times more likely than whites to have tuberculosis (17.77 vs. 3.38 per 100,000). Nonwhite cases included 155 persons who were black and 93 who were Asian or Hispanic. One hundred sixteen (28.3%) of the

Figure 40

Tuberculosis: Rate by Age Group

Virginia, 1990



cases were foreign born. These persons came from 34 different countries. Males were more likely to be reported than females (7.98 vs 5.33 per 100,000).

The Eastern Region reported the highest rate of tuberculosis (8.17), followed by the Central (7.81), Northern (6.43), and Southwest (4.02) Regions. The northern section of the Northern Region reported almost three times more cases than the northwest section.

The overall percentage of sputum culture positive tuberculosis cases whose sputum converted to negative within the first three months of treatment was 52.4%. Of all the cases expected to complete chemotherapy in 1990, 97.3% completed. An average of 11 contacts were identified per case.

Substance abuse and HIV infection were the most commonly reported risk factors for tuberculosis.

Tularemia

Two cases of tularemia were reported this year. Both were in the 50 and older age group, white, and female.

Typhoid Fever

Six cases of typhoid fever were confirmed in 1990. Three had onset in August. Three were children and three adults in their thirties or forties. One was white, the rest nonwhite. Four cases were female. Four were from the Northern Region. History of travel included two cases who had visited India, one Pakistan, and one Guatemala.

Typhus, Flea-borne

One case of typhus was reported in a resident of the Eastern Region. The person was a teenager, who experienced onset of disease during the summer.

Vibrio Infection

Thirteen cases of Vibrio infection were reported in 1990, compared to seven in 1989. Seven were due to Vibrio parahemolyticus, two to V. cholerae (non 01), two to V. vulnificus, and one to V. diazotrophicus. Site was specified for eight cases; six were stool, one foot infection, and one leg infection.