

Reportable Disease Surveillance in Virginia, 1999

*E. Anne Peterson, M.D., M.P.H.
State Health Commissioner*

*Robert B. Stroube, M.D., M.P.H.
State Epidemiologist*

*Report Production Team: Mary Jean Linn, R.N., M.U.R.P.,
Leslie M. Branch, C. Diane Woolard, Ph.D., M.P.H.,
Elizabeth Barrett, D.M.D., M.S.P.H., and Vickie O'Dell*

*Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218*

**Units in the Virginia Department of Health,
Office of Epidemiology**

Surveillance and Investigation

Telephone: (804) 786-6261

Zoonotic Disease Control

Telephone: (804) 786-6261

HIV/STD

Telephone: (804) 786-6267

Immunization

Telephone: (804) 786-6246

Tuberculosis Control

Telephone: (804) 786-6251

Toxic Substances Information

Telephone: (804) 786-1763

Radiological Health

Telephone: (804) 786-5932

Waterborne Hazards Control

Telephone: (804) 786-9008

Bioterrorism

Telephone (804) 786-6261

ACKNOWLEDGMENT:

In addition to the employees of the work units listed on the previous page, the Office of Epidemiology would like to acknowledge the contributions of all persons engaged in disease surveillance and control activities across the state throughout the year.

We appreciate the commitment to public health of all epidemiology staff in local and district health departments and the Central Office, as well as the conscientious work of nurses, environmental health specialists, infection control practitioners, physicians, laboratory staff, and administrators. These persons report or manage disease surveillance data on an ongoing basis and diligently strive to control morbidity in Virginia. This report would not be possible without the efforts of all those who collect and follow up on morbidity reports.

We also thank the Central Office staff who worked on the production of this report.

TABLE OF CONTENTS

List of Figures	v
List of Tables	vii

INTRODUCTION

Introduction	1
Data Summary	3

DESCRIPTIVE EPIDEMIOLOGY OF REPORTABLE DISEASES

Amebiasis	12
Anthrax	12
Arboviral Infection	12
Botulism	12
Brucellosis	13
Campylobacteriosis	13
Chancroid	13
Chickenpox	14
<i>Chlamydia trachomatis</i> Infection	14
Congenital Rubella Syndrome	15
Cryptosporidiosis	15
Cyclosporiasis	15
Diphtheria	15
Ehrlichiosis, Human	15
<i>Escherichia coli</i> 0157:H7	15
Fifth Disease	16
Foodborne Outbreaks	16
Fungal Diseases	18
Giardiasis	18
Gonorrhea	18
Granuloma Inguinale	19
<i>Haemophilus influenzae</i> Infection, Invasive	19
Hansen Disease (Leprosy)	20
Hepatitis A	20
Hepatitis B	21
Hepatitis C	21
Histoplasmosis	22

Human Immunodeficiency Virus (HIV) Infection and the Acquired Immunodeficiency Syndrome (AIDS)	22
Influenza	24
Kawasaki Syndrome	25
Lead, Elevated Levels in Children	25
Legionellosis	26
Leptospirosis	26
Listeriosis	26
Lyme Disease	27
Lymphogranuloma Venereum	28
Malaria	28
Measles	28
Meningococcal Infection	29
Mumps	30
Nosocomial Outbreaks	30
Ophthalmia Neonatorum	30
Parasites, Intestinal	31
Pertussis	31
Phenylketonuria (PKU)	32
Plague	32
Poliomyelitis	32
Psittacosis	32
Q Fever	32
Rabies in Animals	32
Rabies in Humans	33
Reye Syndrome	33
Rocky Mountain Spotted Fever	34
Rubella	34
Salmonellosis	34
Shigellosis	36
Streptococcal Disease, Group A, Invasive	36
Syphilis, Early	36
Congenital Syphilis	37
Tetanus	38
Toxic Shock Syndrome	38
Toxic Substances Related Illnesses	38
Toxoplasmosis	38
Trichinosis	38
Tuberculosis	38
Tularemia	39
Typhoid Fever	40
Typhus	40
<i>Vibrio</i> Infection	40
Cholera	40
Waterborne Outbreaks	40
Yersiniosis	40

**NUMBER OF REPORTED CASES AND RATE PER 100,000 POPULATION FOR
SELECTED DISEASES BY LOCALITY, DISTRICT, AND REGION**

Acquired Immunodeficiency Syndrome	41
Amebiasis	41
Campylobacteriosis	41
Chickenpox	45
<i>Chlamydia trachomatis</i> Infection	45
<i>Escherichia coli</i> O157:H7	45
Giardiasis	49
Gonorrhea	49
<i>Haemophilus influenzae</i> Infection, Invasive	49
Hepatitis A	53
Hepatitis B	53
Hepatitis C	53
HIV Infection	57
Influenza	57
Kawasaki Syndrome	57
Lead Levels in Children	61
Legionellosis	61
Listeriosis	61
Lyme Disease	65
Malaria	65
Measles	65
Meningococcal Infection	69
Mumps	69
Pertussis	69
Rabies in Animals	73
Rocky Mountain Spotted Fever	73
Salmonellosis	73
Shigellosis	77
Syphilis, Early	77
Tuberculosis	77

MAPS OF INCIDENCE RATES BY LOCALITY

Map Illustrating Location of Counties and Selected Independent Cities in Virginia	81
Acquired Immunodeficiency Syndrome	82
Campylobacteriosis	83
Chickenpox	84
<i>Chlamydia trachomatis</i> Infection	85
<i>Escherichia coli</i> O157:H7	86
Giardiasis	87
Gonorrhea	88
<i>Haemophilus influenzae</i> Infection, Invasive	89
Hepatitis A	90
Hepatitis B	91
Hepatitis C	92
HIV Infection	93
Influenza	94
Lead Levels in Children	95
Legionellosis	96
Listeriosis	97
Lyme Disease	98
Malaria	99
Meningococcal Infection	100
Mumps	101
Pertussis	102
Number of Rabid Animals Identified	103
Rocky Mountain Spotted Fever	104
Salmonellosis	105
Shigellosis	106
Syphilis, Early Stage	107
Tuberculosis	108

LIST OF FIGURES

1.	Amebiasis, Rate by Region, Virginia, 1999	12
2.	Campylobacteriosis, Ten Year Trend, Virginia, 1990-1999	13
3.	Campylobacteriosis, Rate by Age Group, Virginia, 1999	13
4.	Chickenpox, Ten Year Trend, Virginia, 1990-1999	14
5.	<i>Chlamydia trachomatis</i> , Rate by Age Group, Virginia, 1999	14
6.	<i>Escherichia coli</i> O157:H7, Trend, Virginia, 1990-1999	16
7.	<i>E. coli</i> O157:H7, Rate by Region, Virginia, 1999	16
8.	Giardiasis, Ten Year Trend, Virginia, 1990-1999	18
9.	Giardiasis, Rate by Region, Virginia, 1999	18
10.	Gonorrhea, Rate by Age Group, Virginia, 1999	19
11.	Gonorrhea, Rate by Region, Virginia, 1999	19
12.	Invasive <i>H. influenzae</i> , Ten Year Trend, Virginia, 1990-1999	19
13.	Hepatitis A, Ten Year Trend, Virginia, 1999	20
14.	Hepatitis A, Rate by Region, Virginia, 1999	20
15.	Hepatitis B, Ten Year Trend, Virginia, 1990-1999	21
16.	HIV Infection, Ten Year Trend, Virginia, 1990-1999	22
17.	HIV Infection, Rate by Age Group, Virginia, 1999	22
18.	A Comparison of AIDS and HIV Infections by Sex, Virginia, 1999	23
19.	HIV Infection, Rate by Region, Virginia, 1999	23
20.	AIDS, Ten Year Trend, Virginia, 1990-1999	23
21.	AIDS, Mode of Transmission, Virginia, 1999	23
22.	Influenza-like Illness Reported in Two “Flu Seasons”	24
23.	Kawasaki Syndrome by Month of Onset, Virginia, 1999	25

24.	Elevated Blood Lead Levels, Age 0-15 Years, Virginia, 1999	25
25.	Race of Children with Elevated Blood Lead Levels, Virginia, 1999	26
26.	Legionellosis, Ten Year Trend, Virginia, 1990-1999	26
27.	Listeriosis, Rate by Age Group, Virginia, 1999	27
28.	Lyme Disease, Ten Year Trend, Virginia, 1990-1999	27
29.	Lyme Disease by Month of Onset, Virginia, 1999	27
30.	Malaria, Ten Year Trend, Virginia, 1990-1999	28
31.	Measles, Ten Year Trend, Virginia, 1990-1999	29
32.	Meningococcal Infection, Ten Year Trend, Virginia, 1990-1999	29
33.	Meningococcal Serogroups, Virginia, 1999	29
34.	Mumps, Ten Year Trend, Virginia, 1990-1999	30
35.	Intestinal Parasites, Virginia, 1999	31
36.	Pertussis, Ten Year Trend, Virginia, 1990-1999	31
37.	Pertussis, Rate by Region, Virginia, 1999	32
38.	Rabies in Animals, Ten Year Trend, Virginia, 1990-1999	32
39.	Species of Animals Positive for Rabies, Virginia, 1999	33
40.	Animal Rabies Tests by Month and Test Result, Virginia, 1999	33
41.	Rabies Post-Exposure Prophylaxis Received, Virginia, 1990-1999	34
42.	Rocky Mountain Spotted Fever, Ten Year Trend, Virginia, 1990-1999	34
43.	Rocky Mountain Spotted Fever by Month of Onset, Virginia, 1999	34
44.	Salmonellosis, Ten Year Trend, Virginia, 1990-1999	35
45.	Salmonellosis by Month of Onset, Virginia, 1999	35
46.	Shigellosis, Ten Year Trend, Virginia, 1990-1999	36
47.	Shigellosis, Rate by Age Group, Virginia, 1999	36

48.	Early Syphilis, Ten Year Trend, Virginia, 1990-1999	37
49.	Early Syphilis, Cases by Sex, Virginia, 1998-1999	37
50.	Early Syphilis, Rate by Region, Virginia, 1999	37
51.	Tuberculosis, Ten Year Trend, Virginia, 1990-1999	39
52.	Tuberculosis, Rate by Age Group, Virginia, 1999	39
53.	Tuberculosis, Rate by Region, Virginia, 1999	39

LIST OF TABLES

Table 1.	Reportable Diseases in Virginia (as of 1/6/99)	5
Table 2.	Ten Year Trend in Number of Reported Cases of Selected Diseases, Virginia, 1990-1999	6
Table 3.	Number of Reported Cases and Rate per 100,000 Population for Selected Diseases by Health Planning Region, Virginia, 1999	7
Table 4.	Number of Reported Cases and Rate per 100,000 Population for Selected Diseases by Age Group, Virginia, 1999	8
Table 5.	Number of Reported Cases and Rate per 100,000 Population for Selected Diseases by Race, Virginia, 1999	9
Table 6.	Number of Reported Cases and Rate per 100,000 Population for Selected Diseases by Sex, Virginia, 1999	10
Table 7.	Number and Percent of Reported Cases for Selected Diseases by Quarter of Onset, Virginia, 1999	11
Table 8.	Foodborne Outbreaks Confirmed in Virginia, 1999	17
Table 9.	Number and Percent of <i>Salmonella</i> Infections by Species, Virginia, 1999	35

INTRODUCTION

AND DATA SUMMARY

Introduction

The Virginia Department of Health, Office of Epidemiology is pleased to present its twelfth annual report of disease surveillance activities. This report summarizes morbidity data reported by the Virginia Department of Health, Office of Epidemiology to the federal Centers for Disease Control and Prevention (CDC) during calendar year 1999.

The Office of Epidemiology is responsible for the ongoing statewide surveillance of diseases reported according to the provisions of the *Regulations for Disease Reporting and Control*. Disease surveillance involves the collection of pertinent data, the tabulation and evaluation of the data, and the dissemination of the information to all who need to know. This process is a very important aspect of public health because the purpose of surveillance is to reduce morbidity.

Diseases must first be diagnosed and reported to the health department before case investigations can occur and disease control activities can begin. Physicians, personnel in medical care facilities, laboratories, and other health care providers, therefore, are key to the surveillance process. Those who report can also benefit because they will be notified when the health department detects unusual disease patterns occurring in the community, thus raising the index of suspicion when individuals present with compatible symptoms and facilitating more rapid diagnosis and treatment.

This report summarizes those diseases and conditions that are either listed as officially reportable in the *Regulations for Disease Reporting and Control* or that represent other communicable diseases of public health interest. The report is divided into four sections as described below.

Introduction and Data Summary: Tables summarizing 1999 morbidity are included in this introductory section. These tables include the list of reportable diseases; ten year trend of disease reports; number of reports and incidence rate per 100,000 population for selected diseases by health planning region, age group, race, and sex; and number and percent of reports by quarter of onset.

Descriptive Epidemiology of Reportable Diseases: This section consists of narrative and graphics summarizing the populations reported with each disease or condition. Included is information about the total number of cases reported; the ten year trend in reported cases; the demographics of cases in terms of their age, race and sex; and the distribution of cases by date of onset and health planning region of the state. Mortality, microbial species, and other attributes of diseases also are presented when applicable.

Population-based rates are often presented to provide a measure of disease risk and allow for comparisons to be made. In calculating rates, two sources of data were used: population projections for the state and its cities and counties prepared by the State Data Center of the Virginia Employment Commission for 1999 and the United States Census Bureau estimates of age, race, gender and ethnicity for Virginia, July 1998. Some additional notes on coding are listed below.

Race is usually coded as black, white, or other. The “other” race category refers to Asian/Pacific Islanders, American Indians, and Alaskan Natives. Date of onset is used whenever it is available. Onset is defined as either month or quarter of the year in which symptoms first occurred. Some cases reported in

1999 experienced onset prior to the year of report. Statistics on some diseases are only available by date of report, meaning date the information was furnished to the CDC or first received in the Office of Epidemiology, rather than date of onset of symptoms. At times, the date of specimen collection or date of hospital admission is used to indicate date of onset.

To the extent possible, rates are calculated based on residence of the patient. When the address of the patient is neither reported nor ascertained by the health department, then locality, district, and/or health planning region level data are based on the location of the reporting source, i.e., the physician, hospital, or laboratory.

Number of Cases and Rate by Locality: In this section of the report are tables containing the number of cases and incidence rate per 100,000 population for selected diseases by locality, district, and health planning region. Cities and counties that have separate health departments are listed individually. Those that share one health department are combined. Caution is urged in interpreting the data listed in this section as well as in the following section. Localities with small populations may have large disease rates but only a few reported cases of disease. Both number of cases and incidence rates should be weighed when using these tables to rank morbidity by city or county.

Maps of Incidence Rates: The first map in this section illustrates the location of the various cities and counties in Virginia. Following that, disease-specific maps are presented which depict the incidence rates listed in the previous section. For each map, the rates have been divided into four categories using the following process:

Category 1 – Localities reporting zero cases of the disease.

Category 2 – Localities with an incidence rate greater than zero and up to the mean for the state.

Category 3 – Localities with an incidence rate greater than the mean and up to one standard deviation above the mean for the state.

Category 4 – Localities with an incidence rate greater than one standard deviation above the mean for the state.

The Office of Epidemiology hopes that the readers of this report will find it to be a valuable resource for understanding the epidemiology of reportable diseases in Virginia. Any questions or suggestions about this report may be directed to Mary Jean Linn, Virginia Department of Health, Office of Epidemiology, P.O. Box 2448, Room 113, Richmond, Virginia 23218.

Data Summary

Following this section are pages containing tables of statewide summary data for selected diseases. Table 1 is a list of reportable conditions in Virginia. Table 2 presents the number of cases of selected diseases reported annually during the past ten years. Table 3 presents number of cases and rate per 100,000 population by health planning region. Table 4 presents the same data by age group; Table 5 by race; and Table 6 by sex. In Table 7, number and percent of cases by quarter of the year in which onset occurred are provided. A brief description of the major findings presented in these tables follows.

TREND - Compared to 1998, notable increases were observed for the following diseases in 1999: chickenpox, *Escherichia coli* O157:H7, invasive *Haemophilus influenzae* infection, influenza, legionellosis, listeriosis, Lyme disease, malaria, measles, meningococcal infection, pertussis, Rocky Mountain spotted fever, and typhoid fever. The percent increase between 1998 and 1999 for these diseases ranged from 15% for *E.coli* O157:H7 all the way up to 800% for measles. Decreases of at least 15% were observed for hepatitis A, hepatitis C, histoplasmosis, mumps and shigellosis.

REGION - The northwest health planning region experienced the highest incidence rates of campylobacteriosis, *E. coli* O157:H7, invasive *H. influenzae* infection, hepatitis C, legionellosis, listeriosis, and Rocky Mountain spotted fever. The northwest region had the lowest rates of AIDS and early syphilis. No cases of measles and typhoid fever were reported from the northwest region.

The northern health planning region had the highest incidence rates of amebiasis, giardiasis, hepatitis A, Kawasaki syndrome, Lyme disease, malaria, shigellosis, tuberculosis, and typhoid fever. The northern region also had the most rabid animals compared to the other regions. The lowest incidence rates of campylobacteriosis, *Chlamydia trachomatis* infection, gonorrhea, invasive *H. influenzae* infection, hepatitis B, influenza, listeriosis and mumps were reported from the northern region.

The southwest health planning region had the highest incidence rates of influenza, measles, and early syphilis. The southwest region had the lowest incidence rates for hepatitis A, HIV infection, Lyme disease, pertussis, Rocky Mountain spotted fever, salmonellosis, tuberculosis and the least number of rabid animals compared to the other regions. No cases of typhoid fever were reported from this region.

The central health planning region experienced the highest incidence rates of AIDS, *C. trachomatis* infection, gonorrhea, HIV infection, meningococcal infection, pertussis and salmonellosis. The lowest incidence rates of chickenpox, *E. coli* O157:H7, and legionellosis were reported from the central region. No cases of hepatitis C, Kawasaki syndrome, measles or typhoid fever were reported from the central region.

The eastern health planning region experienced the highest incidence rates for the following diseases: chickenpox, hepatitis B, and mumps. The lowest incidence rates of giardiasis, malaria, meningococcal infection, and shigellosis were reported from the eastern region. No cases of measles or typhoid fever were reported from this region.

AGE - Infants were the age group at greatest risk for campylobacteriosis, invasive *H. influenzae* infection, listeriosis, measles, meningococcal infection, pertussis, and salmonellosis. Children aged 1-9 years had the highest incidence rates for *E. coli* O157:H7, giardiasis, Kawasaki syndrome, Lyme disease, Rocky Mountain spotted fever, shigellosis, and typhoid fever. Persons aged 10-19 years had the highest rates for *C. trachomatis* infection.

Persons in their twenties were reported with gonorrhea, hepatitis B, and malaria more often than were other age groups. Persons in their thirties had the highest rates for AIDS, amebiasis, hepatitis A, HIV infection, and mumps. Adults in their forties were reported with the highest rates of hepatitis C and early syphilis. Persons aged fifty years and older were reported with legionellosis and tuberculosis more often than were other age groups.

RACE – The black population had the highest rates for AIDS, amebiasis, *C. trachomatis* infection, gonorrhea, invasive *H. influenzae* infection, hepatitis B, HIV infection, Kawasaki syndrome, listeriosis, malaria, meningococcal infection, and early syphilis. The white population was the race group with the highest rates of *E. coli* O157:H7, hepatitis C, legionellosis, Lyme disease, and pertussis. Although based on relatively few numbers of cases, the other race category had the highest rates for campylobacteriosis, giardiasis, measles, mumps, shigellosis, tuberculosis and typhoid fever. All three race groups had similar rates for hepatitis A. Blacks and whites had the same rate for Rocky Mountain spotted fever. The black and other race categories had similar rates for salmonellosis.

SEX - Females were reported proportionately more often than males with the following diseases: *C. trachomatis* infection, *E. coli* O157:H7, invasive *H. influenzae* infection, pertussis, salmonellosis, shigellosis, early syphilis, and typhoid fever. Males were reported more often with AIDS, amebiasis, campylobacteriosis, giardiasis, gonorrhea, all types of hepatitis, HIV infection, Kawasaki syndrome, legionellosis, malaria, Rocky Mountain spotted fever and tuberculosis. The incidence rates were very similar for females and males for listeriosis, Lyme disease, measles, meningococcal infection, and mumps.

ONSET – The first quarter of the year was when the most cases of invasive *H. influenzae* infection, hepatitis B, hepatitis C, influenza and mumps and the fewest cases of amebiasis, campylobacteriosis, *E. coli* O157:H7, giardiasis, Kawasaki syndrome, Lyme disease, measles, pertussis, rabies in animals, salmonellosis, and shigellosis experienced onset. The second quarter of the year was when the most cases of campylobacteriosis, listeriosis, Lyme disease, Rocky Mountain spotted fever and early syphilis were reported. The third quarter of the year was the time of onset for the most cases of *E. coli* O157:H7, giardiasis, hepatitis A, Kawasaki syndrome, legionellosis, malaria, measles, pertussis, salmonellosis, shigellosis and typhoid fever. The fourth quarter was when the most cases of meningococcal infection and rabies in animals were reported. Gonorrhea and *C. trachomatis* infection were reported year round at similar rates. Amebiasis was highest in the second and third quarter and invasive *H. influenzae* infection was lowest for these same quarters. Malaria was reported the lowest in the first and fourth quarters of the year.

Table 1. Reportable Diseases in Virginia (as of 1/6/99)

Acquired immunodeficiency syndrome (AIDS)	Lyme disease
Amebiasis	Lymphogranuloma venereum
Anthrax	Malaria
Arboviral infection	Measles (Rubeola)
Botulism	Meningococcal infection
Brucellosis	Mumps
<i>Campylobacter</i> infection	Ophthalmia neonatorum
Chancroid	Outbreaks, All (including foodborne, nosocomial, occupational, toxic-substance related, waterborne, and other outbreaks)
Chickenpox	Pertussis (Whooping cough)
<i>Chlamydia trachomatis</i> infection	Plague
Cholera	Poliomyelitis
Cryptosporidiosis	Psittacosis
Cyclosporiasis	Rabies, Human and Animal
Diphtheria	Rabies Treatment, post-exposure
Ehrlichiosis	Rocky Mountain spotted fever
<i>Escherichia coli</i> O157:H7 and other enterohemorrhagic <i>E. coli</i> infections	Rubella (German measles), including congenital rubella syndrome
Giardiasis	Salmonellosis
Gonorrhea	Shigellosis
Granuloma inguinale	Streptococcal disease, Group A, invasive
<i>Haemophilus influenzae</i> infection, invasive	Syphilis
Hantavirus pulmonary syndrome	Tetanus
Hemolytic uremic syndrome (HUS)	Toxic shock syndrome
Hepatitis, Acute Viral	Toxic substance-related illness
Hepatitis A	Trichinosis (Trichinellosis)
Hepatitis B	Tuberculosis Disease
Hepatitis C	Tuberculosis infection in children age <4 years
Other Acute Viral Hepatitis	Typhoid fever
Human immunodeficiency virus (HIV) infection	Typhus
Influenza	Vancomycin-resistant <i>Staphylococcus aureus</i>
Kawasaki syndrome	<i>Vibrio</i> infection
Lead - elevated blood levels	Yellow fever
Legionellosis	
Leprosy (Hansen disease)	
Listeriosis	