

Reportable Disease Surveillance in Virginia, 2007

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Introduction

The Virginia Department of Health, Office of Epidemiology is pleased to present its twentieth 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 2007.

The Office of Epidemiology, in conjunction with health departments in districts throughout Virginia, is responsible for the ongoing statewide surveillance of diseases 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. These data provide the foundation for public health activities to reduce morbidity.

Diseases must 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 are therefore key to the surveillance process. By reporting diseases, health care personnel aid the health department in identifying unusual disease patterns occurring in the community. The health department notifies physicians of these unusual disease patterns, which helps physicians provide a more rapid diagnosis and treatment of individuals who present with compatible symptoms.

This report summarizes those diseases and conditions that are listed as officially reportable in the *Regulations for Disease Reporting and Control*. The report is divided into four sections as described below.

Introduction and Data Summary: Tables summarizing 2007 morbidity are included in this introductory section. These tables include the list of reportable diseases; ten year trends; the number of reports and incidence rate per 100,000 population for selected diseases by age group, race, sex, and health planning region; and the 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. The section includes 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. Sources of information include the CDC (<http://www.cdc.gov/>) and *Infectious Disease Epidemiology* (Nelson, K., Williams, C., & Graham, N., 2004).

Population-based rates are often presented to provide a measure of disease frequency in the population and to allow for comparisons between groups. In calculating rates, population estimates for 2006 prepared by the United States Census Bureau for the state's cities and counties and total population were used. Some additional notes on coding are listed below.

Race is usually presented as black, white, or other. The "other" race category includes Asian/Pacific Islanders, American Indians, and Alaskan Natives.

Date of onset is used whenever it is available. Onset is the time at which symptoms first occurred. Some cases reported in 2007 experienced onset prior to the year of report. In some situations information is only available on the date of report, or the date the report was first received by the health department, and these dates are used in place of date of onset. Date of specimen collection or date of diagnosis may also be used to estimate date of onset.

To the extent possible, rates by locality are calculated based on residence of the patient. When the address of the patient is neither reported by the health care provider nor ascertained by the health department, then the location of the reporting source, i.e., the physician, hospital, or laboratory, is used.

Number of Cases and Rate by Locality: This section of the report presents 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 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 health planning regions in Virginia. Following that, disease-specific maps are presented which depict the incidence rates listed in the previous section. For each disease-specific 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 Lala Wilson, Virginia Department of Health, Office of Epidemiology, P.O. Box 2448, 109 Governor St., 5th Floor, Richmond, Virginia 23218. Phone number 804-864-8141.

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 in 2007. Table 2 presents the number of cases of selected diseases reported annually during the past ten years. The number of cases of selected diseases reported for 2007 is delineated by age group in Table 3, by race in Table 4, and by sex in Table 5. Table 6 shows the number of cases and rate per 100,000 by health planning region. Table 7 provides the number and percent of cases with onset by quarter of the year. A brief summary of the major findings presented in these tables follows.

TREND – Notable increases in numbers of cases (>5%) were observed for the following diseases in 2007 compared to 2006: amebiasis, cryptosporidiosis, ehrlichiosis, giardiasis, invasive *Haemophilus influenzae* infection, hepatitis A, acute hepatitis B, Lyme disease, malaria, rabies in animals, Rocky Mountain spotted fever, salmonellosis, shigellosis, invasive group A streptococcal disease, early syphilis and tularemia. Notable decreases occurred for the number of cases of chickenpox, acute hepatitis C, HIV infection, influenza, Kawasaki syndrome, elevated blood lead levels in children, legionellosis, listeriosis, mumps, pertussis and tuberculosis.

AGE – Infants (age <1 year) had the highest incidence rates for campylobacteriosis, Shiga toxin-producing *Escherichia coli* infection, invasive *Haemophilus influenzae* infection, listeriosis, meningococcal disease, pertussis, salmonellosis and invasive *Streptococcus pneumoniae* in children less than 5 years old. They showed the lowest rates for amebiasis, ehrlichiosis, hepatitis A, acute hepatitis B, Lyme disease, Rocky Mountain spotted fever and *Vibrio* infection. Among the conditions for which reports were received in 2007, no cases of AIDS, amebiasis, arboviral infection, Creutzfeldt-Jakob disease, ehrlichiosis, Hansen disease, hemolytic uremic syndrome, hepatitis A, acute hepatitis B, acute hepatitis C, legionellosis, mumps, Q fever, Rocky Mountain spotted fever, early syphilis, tularemia, typhoid fever or *Vibrio* infection were reported in infants.

Children aged 1-9 years had the highest incidence rates for chickenpox, giardiasis, hepatitis A, elevated blood lead levels in children, malaria, mumps, shigellosis, tularemia and typhoid fever. The only reported case of hemolytic uremic syndrome occurred in this age group. The lowest rates of *Chlamydia trachomatis* infection, gonorrhea, HIV infection, invasive *Streptococcus pneumoniae* in children less than 5 years old and tuberculosis were reported for this age group. Among the conditions for which reports were received in 2007, no cases of AIDS, Creutzfeldt-Jakob disease, Hansen disease, acute hepatitis C, listeriosis, Q fever or early syphilis were reported among children aged 1-9 years.

Incidence rates in the 10-19 year age group did not exceed the rates in other age groups for any reportable condition in 2007. This age group experienced the lowest rates for campylobacteriosis, elevated blood lead levels in children, salmonellosis and invasive group A streptococcal disease. There were no cases of arboviral infection, Creutzfeldt-Jakob disease, Hansen disease, hemolytic uremic syndrome, Kawasaki syndrome, legionellosis, Q fever or tularemia reported in this age group.

Persons in their twenties had higher rates of amebiasis, *Chlamydia trachomatis* infection, gonorrhea, acute hepatitis C, HIV infection, early syphilis and tuberculosis than persons in other age groups. No cases of arboviral infection, Creutzfeldt-Jakob disease, Hansen

disease, hemolytic uremic syndrome, Kawasaki syndrome, listeriosis, Q fever or tularemia were reported in this age group.

Rates for persons in their thirties did not exceed the rates in other age groups for any reportable condition in 2007. The rate for cryptosporidiosis was lower in this group than in the other age groups. The only cases of Creutzfeldt-Jakob disease and Hansen disease were reported in the 30-39 year age group. No cases of hemolytic uremic syndrome, acute hepatitis C or Kawasaki syndrome were reported in this age group.

Persons in their forties had the highest rates of AIDS and Lyme disease and the lowest rate of invasive *Haemophilus influenzae* infection. There were no cases of arboviral infection, Creutzfeldt-Jakob disease, Hansen disease, hemolytic uremic syndrome, Kawasaki syndrome or tularemia in this age group.

Incidence rates for those in their fifties did not exceed the rates in other age groups for any reportable condition in 2007. The lowest rate of shigellosis was reported in the 50-59 year age group and no cases of Creutzfeldt-Jakob disease, Hansen disease, hemolytic uremic syndrome, acute hepatitis C, Kawasaki syndrome, mumps or tularemia were reported in this age group.

The sixty year and older age group had the highest rates of arboviral infection, ehrlichiosis, legionellosis, invasive group A streptococcal disease and *Vibrio* infection and the lowest rates of chickenpox, giardiasis, malaria and pertussis. In this age group, no cases of Hansen disease, hemolytic uremic syndrome, Kawasaki syndrome, mumps, tularemia or typhoid fever were reported.

RACE – Among conditions where race was known for at least 80% of cases, the black population had a higher incidence rate for AIDS, *Chlamydia trachomatis* infection, gonorrhea, HIV infection, legionellosis, meningococcal disease, invasive group A streptococcal disease, invasive *Streptococcus pneumoniae* in children less than 5 years old and early syphilis. The white population had a higher incidence rate for arboviral infection, chickenpox, pertussis and Rocky Mountain spotted fever. The single cases of Creutzfeldt-Jakob disease and hemolytic uremic syndrome both occurred in the white population. The “other” race group had the highest rates for mumps and tuberculosis.

SEX – In general, the incidence rates of reportable diseases tend to be similar in males and females. Reported rates of the following diseases were notably higher among females in 2007: *Chlamydia trachomatis* infection, invasive *Haemophilus influenzae* infection, Kawasaki syndrome, mumps and typhoid fever. Incidence rates were higher among males for AIDS, amebiasis, arboviral infection, ehrlichiosis, hepatitis A, HIV infection, legionellosis, early syphilis, tularemia and *Vibrio* infection. The single cases of Creutzfeldt-Jakob disease, Hansen disease and hemolytic uremic syndrome occurred in males.

REGION – The northwest health planning region had the highest incidence rates for amebiasis, campylobacteriosis, ehrlichiosis, Shiga toxin-producing *Escherichia coli* infection, giardiasis, legionellosis, listeriosis, meningococcal disease, mumps, pertussis, invasive group A streptococcal disease and invasive *Streptococcus pneumoniae* in children less than 5 years old compared to the other regions of the state. The lowest incidence rates for chickenpox, HIV infection, influenza, early syphilis and tuberculosis were seen in this region. The northwest region had the single cases of Hansen disease and hemolytic uremic syndrome. No cases of

arboviral infection, Creutzfeldt-Jakob disease, acute hepatitis C, Kawasaki syndrome, Q fever or tularemia were reported from the northwest region.

The northern health planning region experienced the highest incidence rates for hepatitis A, Lyme disease, malaria, salmonellosis, shigellosis, tuberculosis and typhoid fever. The lowest incidence rates for *Chlamydia trachomatis* infection, cryptosporidiosis, gonorrhea, invasive *Haemophilus influenzae* infection, acute hepatitis B, elevated blood lead levels in children, pertussis, Rocky Mountain spotted fever, invasive group A streptococcal disease and invasive *Streptococcus pneumoniae* in children less than 5 years old were reported from the northern region. No cases of Creutzfeldt-Jakob disease, Hansen disease, hemolytic uremic syndrome, Kawasaki syndrome or Q fever were reported from this region.

The southwest health planning region had the highest incidence rates for cryptosporidiosis, invasive *Haemophilus influenzae* infection, influenza and Rocky Mountain spotted fever. It had the lowest rates for AIDS, Lyme disease, shigellosis and typhoid fever. There were no cases of arboviral infection, Creutzfeldt-Jakob disease, Hansen disease, hemolytic uremic syndrome, Kawasaki syndrome or typhoid fever reported from the southwest.

The central health planning region experienced the highest rates for gonorrhea, acute hepatitis B and elevated blood lead levels in children. The lowest rates for amebiasis, legionellosis, malaria and salmonellosis were seen in this region. The only case of Creutzfeldt-Jakob disease was reported from the region. No cases of Hansen disease, hemolytic uremic syndrome or tularemia were reported from the central region.

The eastern health planning region had the highest incidence rates for AIDS, chickenpox, *Chlamydia trachomatis* infection, HIV infection, early syphilis and *Vibrio* infection. This region experienced the lowest rates for campylobacteriosis, Shiga toxin-producing *Escherichia coli* infection, giardiasis, hepatitis A and mumps. No cases of Creutzfeldt-Jakob disease, Hansen disease or hemolytic uremic syndrome were reported from the eastern region.

ONSET – A few diseases showed distinct seasonal trends. The largest proportion of influenza (76%) and mumps (52%) cases occurred during the first quarter of the year. The largest proportion of chickenpox (76%) cases occurred during the first and second quarters. The second and third quarters accounted for the largest proportion of cases of ehrlichiosis (87%), Shiga toxin-producing *Escherichia coli* infection (64%), Lyme disease (74%), Rocky Mountain spotted fever (87%), salmonellosis (62%) and shigellosis (64%). The largest proportions of arboviral infection (80%), listeriosis (50%), typhoid fever (38%) and *Vibrio* infection (67%) had onset during the third quarter. The two Kawasaki syndrome cases occurred in the third and fourth quarters, as did the largest proportion of listeriosis (64%). Together, the fourth and first quarters included the largest proportion of meningococcal disease (61%) and invasive *Streptococcus pneumoniae* in children less than 5 years old (63%). More than 10% of the AIDS, acute hepatitis B, acute hepatitis C, HIV infection, mumps, pertussis and early syphilis cases reported in 2007 had onset in the prior year. This is due to delays in obtaining case reports or information needed to confirm a case. Similar delays for cases with onset in 2007 are likely to have the most significant impact on fourth quarter onsets.

Table 1. Reportable Diseases in Virginia, 2007

Acquired immunodeficiency syndrome (AIDS)	Meningococcal disease
Amebiasis	Monkeypox
Anthrax	Mumps
Arboviral infection (e.g., EEE, LAC, SLV, WNV)	Ophthalmia neonatorum
Botulism	Outbreaks, all (including foodborne, nosocomial, occupational, toxic substance-related, waterborne, and other outbreaks)
Brucellosis	Pertussis
Campylobacteriosis	Plague
Chancroid	Poliomyelitis
Chickenpox (Varicella)	Psittacosis
<i>Chlamydia trachomatis</i> infection	Q fever
Cholera	Rabies, human and animal
Creutzfeldt-Jakob disease if <55 years of age	Rabies treatment, post exposure
Cryptosporidiosis	Rocky Mountain spotted fever
Cyclosporiasis	Rubella, including congenital rubella syndrome
Diphtheria	Salmonellosis
Disease caused by an agent that may have been used as a weapon	Severe acute respiratory syndrome (SARS)
Ehrlichiosis	Shigellosis
<i>Escherichia coli</i> infection, Shiga toxin-producing	Smallpox
Giardiasis	<i>Staphylococcus aureus</i> infection (invasive methicillin-resistant and any vancomycin-intermediate or vancomycin-resistant)
Gonorrhea	Streptococcal disease, Group A, invasive
Granuloma inguinale	<i>Streptococcus pneumoniae</i> infection, invasive, in children <5 years of age
<i>Haemophilus influenzae</i> infection, invasive	Syphilis
Hantavirus pulmonary syndrome	Tetanus
Hemolytic uremic syndrome (HUS)	Toxic shock syndrome
Hepatitis A	Toxic substance-related illness
Hepatitis B (acute and chronic)	Trichinosis (Trichinellosis)
Hepatitis C (acute and chronic)	Tuberculosis, active disease (Mycobacteria)
Hepatitis, other acute viral	Tuberculosis infection in children <4 years of age
Human immunodeficiency virus (HIV) infection	Tularemia
Influenza	Typhoid fever
Influenza-associated deaths in children <18 years	Unusual occurrence of disease of public health concern
Kawasaki syndrome	Vaccinia, disease or adverse event
Lead - elevated blood levels	<i>Vibrio</i> infection
Legionellosis	Viral hemorrhagic fever
Leprosy (Hansen disease)	Yellow fever
Listeriosis	Yersiniosis
Lyme disease	
Lymphogranuloma venereum	
Malaria	
Measles (Rubeola)	