Reportable Disease Surveillance in Virginia, 2010

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Introduction

The Virginia Department of Health, Office of Epidemiology is pleased to present its twenty-third 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 2010.

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 2010 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 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/), *Infectious Disease Epidemiology* (Nelson, K., Williams, C., & Graham, N., 2004), *Red Book: 2009 Report of the Committee on Infectious Diseases* (American Academy of Pediatrics, Pickering, L., Baker, C., Kimberlin, D., Long, S., eds., 2009), and *Control of Communicable Diseases Manual* (Heymann, D., ed., 2008)

Population-based rates are often presented to provide a measure of disease frequency in the population and to allow for comparisons between groups. When calculating rates, population estimates for 2009 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 2010 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, the location of the reporting source, such as 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, while the second map provides a geographical view of counties and selected cities in the state. 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 at the Virginia Department of Health, Office of Epidemiology, P.O. Box 2448, 109 Governor St., 5th Floor, Richmond, Virginia 23218, or by telephone at 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 2010. 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 2010 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 2010 compared to 2009: arboviral infection, cryptosporidiosis, ehrlichiosis/anaplasmosis, hepatitis A, acute hepatitis C, legionellosis, Lyme disease, malaria, meningococcal disease, mumps, pertussis, salmonellosis, invasive *Staphylococcus aureus* infection (MRSA), invasive group A streptococcal disease, *Streptococcus pneumoniae* in children less than 5 years old, *Vibrio* infection, and yersiniosis. Notable decreases occurred for the number of cases of amebiasis, chickenpox, gonorrhea, acute hepatitis B, influenza, elevated blood lead levels in children, listeriosis, shigellosis, toxic substance-related illness, and typhoid fever. A decrease in HIV disease was witnessed from 2009 however cases still remain well above the levels prior to 2009.

AGE – Infants (age <1 year) had the highest incidence rates for campylobacteriosis, chickenpox, 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 rate for arboviral infection, ehrlichiosis/anaplasmosis, gonorrhea, hepatitis A, HIV disease, Lyme disease, malaria, Rocky Mountain spotted fever, shigellosis, tuberculosis, and *Vibrio* infection. No cases of amebiasis, arboviral infection, ehrlichiosis/anaplasmosis, gonorrhea, hemolytic uremic syndrome (HUS), hepatitis A, acute hepatitis C, HIV disease, Kawasaki syndrome, legionellosis, Lyme disease, malaria, measles, mumps, Q fever, Rocky Mountain spotted fever, shigellosis, early syphilis, tuberculosis, typhoid fever, or *Vibrio* infection were reported in infants.

Children aged 1-9 years had the highest incidence rates for giardiasis, elevated blood lead levels in children, Lyme disease, measles, and shigellosis. The only cases of hemolytic uremic syndrome (HUS) and Kawasaki syndrome were reported from this age group. The lowest rates of *Chlamydia trachomatis* infection, acute hepatitis B, invasive *Staphylococcus aureus* infection (MRSA), and invasive *Streptococcus pneumoniae* in children less than 5 years old were reported among children aged 1-9 years. No cases of acute hepatitis B, acute hepatitis C, legionellosis, listeriosis, Q fever, or early syphilis were reported in this age group.

* Beginning with 2009 data, HIV infection and AIDS are no longer being presented separately. Instead, HIV disease will represent the number of persons newly reported to VDH with HIV infection regardless of disease progression, and includes people with an AIDS defining condition at first HIV report.

Incidence rates in the 10-19 year age group were lowest for campylobacteriosis, cryptosporidiosis, elevated blood lead levels in children, salmonellosis, and invasive group A streptococcal disease. This age group had the highest incidence rates for amebiasis. There were no cases of hemolytic uremic syndrome (HUS), acute hepatitis C, Kawasaki syndrome, legionellosis, listeriosis, measles, Q fever, or typhoid fever reported in this age group.

Persons in their twenties had higher rates of *Chlamydia trachomatis* infection, gonorrhea, hepatitis A, HIV disease, and early syphilis. This group had the lowest rates for invasive *Haemophilus influenzae* infection, and pertussis for 2010. No cases of hemolytic uremic syndrome (HUS), or Kawasaki syndrome were reported for this age group.

Rates for persons in their thirties exceeded the rates in other age groups for arboviral infection, acute hepatitis B and typhoid fever. No cases of hemolytic uremic syndrome (HUS), Kawasaki syndrome, or measles were reported and no disease or condition was represented with the lowest incidence rate in this age group.

Incidence rates for those in their forties were the highest for malaria and the lowest for Shiga-toxin producing *Escherichia coli* infection. No cases of amebiasis, listeriosis, hemolytic uremic syndrome (HUS), Kawasaki syndrome, measles, or Q fever were reported in this age group.

Individuals age fifty to fifty-nine had the highest incidence rates for Rocky Mountain spotted fever. The lowest rate for chickenpox occurred in this group and no cases of hemolytic uremic syndrome (HUS), Kawasaki syndrome, measles, mumps, Q fever, or typhoid fever were reported in this age group.

The sixty year and older age group had the highest rates of cryptosporidiosis, ehrlichiosis/anaplasmosis, legionellosis, invasive *Staphylococcus aureus* infection (MRSA), invasive group A streptococcal disease, tuberculosis, and *Vibrio* infection. The lowest rates occurred for giardiasis. In this age group, no cases of hemolytic uremic syndrome (HUS), acute hepatitis C, Kawasaki syndrome, measles, Q fever, 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 gonorrhea, HIV disease, invasive *Streptococcus pneumoniae* in children less than 5 years old, and early syphilis. The only two cases of HUS reported in 2010 occurred in the white population. Of the two reported cases of Kawasaki syndrome, one occurred in the black population and one occurred in the "other" population. The "other" race group had the highest rate for tuberculosis.

SEX – In general, the incidence rates of reportable diseases tend to be similar in males and females. Among conditions where the percent difference between reported sexes was at least 50%, incidence rates for *Chlamydia trachomatis* infection, measles, mumps and typhoid fever were notably higher among females in 2010. Incidence rates were higher among males for ehrlichiosis/anaplasmosis, acute hepatitis C, HIV disease, legionellosis, listeriosis, meningococcal disease, and early syphilis. In addition, the two reported cases

of Kawasaki syndrome and the Q fever were all male while the two cases for hemolytic uremic syndrome were all female. Incidence was the same for females and males for cryptosporidiosis, salmonellosis, shigellosis, and invasive *Streptococcus pneumoniae* in children less than 5 years old.

REGION – The northwest health planning region had the highest incidence rates for arboviral infection, campylobacteriosis, chickenpox, Shiga-toxin producing *Escherichia coli* infection, legionellosis, Lyme disease, meningococcal disease, pertussis, and invasive *Streptococcus pneumoniae* in children less than 5 years old compared to the other regions of the state. The lowest incidence rates for HIV disease and early syphilis were seen in this region. No cases of hemolytic uremic syndrome, Kawasaki syndrome, measles, Q fever, or typhoid fever were reported from the northwest region.

The northern health planning region experienced the highest incidence rates for amebiasis, giardiasis, hepatitis A, influenza, malaria, shigellosis, tuberculosis, and typhoid fever. The lowest incidence rates for *Chlamydia trachomatis* infection, gonorrhea, invasive *Haemophilus influenzae* infection, acute hepatitis B, acute hepatitis C, elevated blood lead levels in children, legionellosis, listeriosis, invasive *Staphylococcus aureus* infection (MRSA), and invasive group A streptococcal disease were reported from the northern region. No cases of hemolytic uremic syndrome or Kawasaki syndrome were reported from this region. In addition, all three measles cases and the only Q fever case reported in 2010 were from the northern region.

The southwest health planning region had the highest incidence rates for cryptosporidiosis, ehrlichiosis/anaplasmosis, invasive *Haemophilus influenzae* infection, hemolytic uremic syndrome, acute hepatitis C, listeriosis, rabies in animals, and invasive group A streptococcal disease. It had the lowest rates for giardiasis, hepatitis A, malaria, salmonellosis, invasive *Streptococcus pneumoniae* in children less than 5 years old, tuberculosis, and *Vibrio* infection. There were no cases of Kawasaki syndrome, measles, Q fever, or typhoid reported from the southwest. All two cases of hemolytic uremic syndrome reported in 2010 occurred in the southwest region.

The central health planning region experienced the highest rates for acute hepatitis B, influenza, elevated blood lead levels in children, Rocky Mountain spotted fever, invasive *Staphylococcus aureus* infection (MRSA), and early syphilis. The lowest rates for cryptosporidiosis, meningococcal disease, and shigellosis were seen in this region. No cases of arboviral, hemolytic uremic syndrome, Kawasaki syndrome, measles, Q fever, or typhoid were reported from the central region.

The eastern health planning region had the highest incidence rates for *Chlamydia trachomatis* infection, gonorrhea, HIV disease, Kawasaki syndrome, mumps, salmonellosis, and *Vibrio* infection. This region experienced the lowest rates for campylobacteriosis, chickenpox, ehrlichiosis/anaplasmosis, Shiga toxin-producing *Escherichia coli* infection, influenza, Lyme disease, rabies in animals, and Rocky Mountain spotted fever. No cases of hemolytic uremic syndrome, measles, or Q fever were reported from the eastern region. The only two cases of Kawasaki syndrome reported in 2010 occurred in the eastern region.

ONSET – A few diseases showed distinct seasonal trends with the majority of onset occurring within one or two quarters. The largest portion of cases for acute hepatitis C (38.5%), meningococcal disease (47.6%), invasive group A streptococcal disease (36.6%), and typhoid fever (36.4%) occurred during the first quarter of the year. The largest proportion of cases for cryptosporidiosis (36.7%) occurred during the second quarter of the year. The largest proportion of cases for Amebiasis (35.7%), arboviral infection (70%), and salmonellosis (42.3%) occurred in the third quarter. Pertussis (46.6%) cases had the largest onset during the fourth quarter. For those diseases where the majority of onset spanned two quarters, the largest proportion of cases for mumps (69.3%) and *Streptococcus pneumoniae* (66.4%) in children less than 5 years old occurred during the first and second quarters. The second and third quarters accounted for the largest proportion of cases of ehrlichiosis/anaplasmosis (91.4%), Lyme disease (74.8%), malaria (59.7%), Rocky Mountain spotted fever (87.6%), and *Vibrio* infection (85%). Influenza (90.4%) was the only reported disease that had the majority of its cases spanning the first and fourth quarter. More than 10% of the cases for Q fever, and invasive *Streptococcus pneumoniae* in children less than 5 years old reported in 2010 had onset in the prior year. This is a result of delays in obtaining case reports or information needed to confirm a case. Similar delays for cases with late onset in 2010 are likely to have reduced the number of reported cases in the fourth quarter. Several diseases had very low onset percentages for at least one quarter. These included ehrlichiosis/anaplasmosis (3.2%), listeriosis (7.7%) Lyme disease (7.6%) and Rocky Mountain spotted fever (4.1%) for the first quarter; influenza (5.2%) for the second quarter; and typhoid fever (9.1%) for the fourth quarter. In addition, several diseases had no onset reported in at least one quarter. These diseases included *Vibrio* infection (first quarter), hemolytic uremic syndrome (first and third quarter), Kawasaki syndrome (first and fourth quarter), measles (first, second, and fourth quarter), and Q fever (first, third, and fourth quarter).

Table 1. Reportable Diseases in Virginia, 2010

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