Reportable Disease Surveillance in Virginia, 2009

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Introduction

The Virginia Department of Health, Office of Epidemiology is pleased to present its twenty-second 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 2009.

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 2009 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 2008 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 2009 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.
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> 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 2009. 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 2009 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 2009 compared to 2008: AIDS, arboviral infection, brucellosis, campylobacteriosis, cryptosporidiosis, ehrlichiosis, giardiasis, acute hepatitis C, HIV infection, influenza, elevated blood lead levels in children, malaria, pertussis, invasive group A streptococcal disease, and early syphilis. Notable decreases occurred for the number of cases of amebiasis, chickenpox, Shiga-toxin producing *Escherichia coli* infection, gonorrhea, hepatitis A, acute hepatitis B, listeriosis, meningococcal disease, opthalmia neonatorum, rabies in animals, Rocky Mountain spotted fever, salmonellosis, shigellosis, invasive *Staphylococcus aureus* infection (MRSA), invasive *Streptococcus pneumoniae* in children less than 5 years old, tuberculosis, typhoid fever, and yersiniosis.

AGE – Infants (age <1 year) had the highest incidence rates for campylobacteriosis, cryptosporidiosis, Shiga-toxin producing *Escherichia coli* infection, Kawasaki syndrome, listeriosis, pertussis, salmonellosis, and invasive *Streptococcus pneumoniae* in children less than 5 years old. They showed the lowest rate for amebiasis, ehrlichiosis, hepatitis A, Lyme disease, malaria, Rocky Mountain spotted fever, tuberculosis, and *Vibrio* infection. No cases of AIDS, arboviral infection, acute hepatitis B, acute hepatitis C, HIV infection, legionellosis, meningococcal disease, mumps, early syphilis, or typhoid fever were reported in infants.

Children aged 1-9 years had the highest incidence rates for chickenpox, giardiasis, elevated blood lead levels in children, shigellosis, and typhoid fever. The only cases of hemolytic uremic syndrome (HUS) were reported from this age group. The lowest rates of *Chlamydia trachomatis* infection, gonorrhea, 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 AIDS, acute hepatitis B, acute hepatitis C, HIV infection, legionellosis, listeriosis, meningococcal disease, or early syphilis were reported in this age group.

Incidence rates in the 10-19 year age group were lowest for campylobacteriosis, invasive *Haemophilus influenzae* infection, elevated blood lead levels in children, and invasive group A streptococcal disease. There were no cases of arboviral infections, acute hepatitis C, Kawasaki syndrome, legionellosis, or listeriosis reported in this age group. In addition, this age group did not represent the highest incidence rate for any disease or condition.

Persons in their twenties had higher rates of *Chlamydia trachomatis* infection, gonorrhea, hepatitis A, acute hepatitis C, HIV infection, malaria, meningitis, mumps, and early syphilis. This group also had the only reported case of measles in 2009. No cases of Kawasaki syndrome were reported in this age group. No disease or condition was represented with the lowest incidence rate from this age group.

Rates for persons in their thirties exceeded the rates in other age groups for acute hepatitis B and tuberculosis. No cases of arboviral infection, Kawasaki syndrome, or meningococcal disease, and no disease or condition with the lowest incidence rate was reported in this age group.

Incidence rates for those in their forties exceeded the rates in other age groups for AIDS and Rocky Mountain spotted fever. Persons in their forties had the lowest rate of cryptosporidiosis, Shiga-toxin producing *Escherichia coli* infection, and salmonellosis. No cases of Kawasaki syndrome were reported in this age group.

Incidence rates for those in their fifties exceeded the rates in other age groups for amebiasis and Lyme disease. The only reported case of Q fever occurred in this age group. The lowest rate for shigellosis occurred in the 50-59 year age group and no cases of acute hepatitis C, Kawasaki syndrome, or mumps were reported in this age group.

The sixty year and older age group had the highest rates of arboviral disease, ehrlichiosis, invasive *Haemophilus influenzae* infection, legionellosis, invasive *Staphylococcus aureus* infection (MRSA), invasive group A streptococcal disease, and *Vibrio* infection, and the lowest rates of chickenpox, giardiasis, pertussis, and early syphilis. In this age group, no cases of acute hepatitis C, Kawasaki syndrome, 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, gonorrhea, HIV infection, invasive *Streptococcus pneumoniae* in children less than 5 years old and early syphilis. The white population did not have a higher incidence rate than other populations for any disease where at least 80% of cases had a reported race. However, the only cases of HUS, measles, and Q fever reported in 2009 occurred in the white population. Of the 3 reported cases of Kawasaki syndrome, 2 occurred in the black population and one occurred in the white 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 and acute hepatitis C were notably higher among females in 2009. Incidence rates were higher among males for AIDS, arboviral disease, HIV infection, malaria, early syphilis, and *Vibrio* infection. In addition, the two reported cases of hemolytic uremic syndrome and the single reported cases of measles and Q fever were all male. Incidence was the same for females and males for amebiasis, invasive *Haemophilus influenzae* infection, meningococcal disease, shigellosis, and typhoid fever.

REGION – The northwest health planning region had the highest incidence rates for campylobacteriosis, chickenpox, cryptosporidiosis, ehrlichiosis/anaplasmosis, Shiga toxin-producing *Escherichia coli* infection, invasive *Haemophilus influenzae* infection, rabies in animals, Rocky Mountain spotted fever, salmonellosis, shigellosis, 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 AIDS, acute hepatitis B, HIV disease, early syphilis, and typhoid fever were seen in this region. No cases of hemolytic uremic syndrome, Kawasaki syndrome, measles, or typhoid fever were reported from the northwest region. In addition, the one case of Q fever reported in 2009 was reported from the northwest region.

The northern health planning region experienced the highest incidence rates for amebiasis, giardiasis, hepatitis A, HIV disease, Lyme disease, malaria, tuberculosis, and typhoid fever. The lowest incidence rates for *Chlamydia trachomatis* infection, ehrlichiosis/anaplasmosis, gonorrhea, invasive *Haemophilus influenzae* infection, elevated blood lead levels in children, listeriosis, meningococcal disease, mumps, rabies in animals, invasive *Staphylococcus aureus* infection (MRSA), 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 hemolytic uremic syndrome, Kawasaki, or Q fever syndrome were reported from this region. In addition, the one measles case reported in 2009 was reported from the northern region.

The southwest health planning region had the highest incidence rates for acute hepatitis C, legionellosis, and meningococcal disease. It had the lowest rates for giardiasis, influenza, salmonellosis, tuberculosis, and *Vibrio* infection. There were no cases of measles or Q fever reported from the southwest.

The central health planning region experienced the highest rates for AIDS, acute hepatitis B, influenza, elevated blood lead levels in children, pertussis, invasive *Staphylococcus aureus* infection (MRSA), and early syphilis. The lowest rate for chickenpox was seen in this region. No cases of measles or Q fever were reported from the central region.

The eastern health planning region had the highest incidence rates for *Chlamydia trachomatis* infection, gonorrhea, and *Vibrio* infection. This region experienced the lowest rates for arboviral infection, campylobacteriosis, Shiga toxin-producing *Escherichia coli* infection, hepatitis A, legionellosis, Lyme disease, pertussis, and shigellosis. No cases of arboviral infection, hemolytic uremic syndrome, measles, or Q fever were reported from the eastern region.

ONSET – A few diseases showed distinct seasonal trends with the majority of onset occurring within one or two quarters. The largest proportion of cases for listeriosis (37%) and Rocky Mountain spotted fever (49%) occurred during the second quarter of the year. The largest proportion of cases for arboviral infection (87%), cryptosporidiosis (38%), hepatitis A (43%), malaria (47%), pertussis (37%), salmonellosis (38%), and Vibrio infection (55%) occurred in the third quarter. Fifty-five percent of influenza cases had onset during the fourth quarter. For those diseases where the majority of onset spanned

two quarters, the largest proportion of cases for amebiasis (80%) and mumps (78%) occurred during the first and second quarters. The second and third quarters accounted for the largest proportion of cases of ehrlichiosis/anaplasmosis (93%), Shiga toxin-producing *Escherichia coli* infection (70%) and Lyme disease (75%). More than 10% of cases for acute hepatitis C, mumps, and invasive *Streptococcus pneumoniae* in children less than 5 years old reported in 2009 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 2009 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 cryptosporidiosis (10%), ehrlichiosis/anaplasmosis (1%) and legionellosis (9%) for the first quarter; influenza (6%) for the second quarter; and amebiasis (5%), Lyme disease (8%), and Rocky Mountain spotted fever (4%) for the fourth quarter. In addition, several diseases had no onset reported in at least one quarter. These diseases included arboviral infection (first and second quarter), mumps (fourth quarter), and *Vibrio* infection (first quarter).

Table 1. Reportable Diseases in Virginia, 2009

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