Reportable Disease Surveillance in Virginia, 2008

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Introduction

The Virginia Department of Health, Office of Epidemiology is pleased to present its twenty-first 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 2008.

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 2008 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/) 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. When calculating rates, population estimates for 2007 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 2008 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 2008. Table 2 presents the number of cases of notifiable diseases reported annually during the past ten years. The number of cases of selected diseases reported for 2008 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 – Increases of greater than 5% in the number of cases in 2008 compared to 2007 were observed for the following diseases: AIDS, *Chlamydia trachomatis* infection, ehrlichiosis, Shiga toxin-producing *Escherichia coli* infection, gonorrhea, invasive *Haemophilus influenzae* infection, influenza, legionellosis, listeriosis, ophthalmia neonatorum, pertussis, Rocky Mountain spotted fever, shigellosis, early syphilis and yersiniosis. Decreases of greater than 5% in the number of cases in 2008 compared to 2007 occurred for amebiasis, chickenpox, cryptosporidiosis, giardiasis, hepatitis A, acute hepatitis B, elevated blood lead levels in children, malaria, mumps, rabies in animals, salmonellosis, invasive group A streptococcal disease, toxic substance-related illness, tuberculosis, typhoid fever and *Vibrio* infection.

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, invasive group A streptococcal disease, invasive *Streptococcus pneumoniae* in children less than 5 years old, and *Vibrio* infection. Comparatively across all age groups, infants showed the lowest rates for AIDS, cryptosporidiosis, ehrlichiosis, giardiasis, hepatitis A, acute hepatitis B, Lyme disease, malaria, and Rocky Mountain spotted fever. No cases of AIDS, amebiasis, arboviral infection, cryptosporidiosis, ehrlichiosis, hemolytic uremic syndrome, hepatitis A, acute hepatitis B, acute hepatitis C, Kawasaki syndrome, legionellosis, Lyme disease, malaria, measles, mumps, Q fever, Rocky Mountain spotted fever, early syphilis, or typhoid fever were reported in infants.

Children aged 1-9 years had the highest incidence rates for arboviral infection, chickenpox, giardiasis, elevated blood lead levels in children, Lyme disease, shigellosis, and typhoid fever. The lowest rates of *Chlamydia trachomatis* infection, gonorrhea, HIV infection, meningococcal disease, invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infection, invasive *Streptococcus pneumoniae* in children less than 5 years old, and tuberculosis were reported for this age group. The only reported cases of hemolytic uremic syndrome, Kawasaki syndrome, and measles occurred in this age group. Among the conditions for which reports were received in 2008, no cases of amebiasis, acute hepatitis C, legionellosis, listeriosis, meningococcal disease, Q fever, or early syphilis were reported among children aged 1-9 years.

Incidence rates in the 10-19 year age group were highest for hepatitis A and mumps. This age group experienced the lowest rates for campylobacteriosis, invasive *Haemophilus influenzae* infection, and elevated blood lead levels in children. No cases of arboviral infection, hemolytic uremic syndrome, acute hepatitis C, Kawasaki syndrome, legionellosis, listeriosis, measles, or Q fever were reported in this age group.

Persons in their twenties had the highest rates of amebiasis, *Chlamydia trachomatis* infection, gonorrhea, acute hepatitis B, HIV infection, and early syphilis infection. The rate for invasive group A

streptococcal disease was lower in this group than in the other age groups. No cases of arboviral infection, hemolytic uremic syndrome, Kawasaki syndrome, legionellosis, listeriosis, or measles were reported in this age group.

Rates for persons in their thirties exceeded the rates in other age groups for AIDS, acute hepatitis C, and malaria. The rate for Shiga toxin-producing *Escherichia coli* infection, was lower in this group than in the other age groups. No cases of arboviral infection, hemolytic uremic syndrome, Kawasaki syndrome, measles, or Q fever were reported in this age group.

Incidence rates for those in their forties did not exceed the rates in other age groups nor were they the lowest for any reportable condition in 2008. No cases of arboviral infection, hemolytic uremic syndrome, Kawasaki syndrome, listeriosis, measles, mumps, Q fever, or typhoid fever were reported 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 2008. The lowest rates for chickenpox and salmonellosis occurred in the 50-59 year age group, and no cases of arboviral infection, hemolytic uremic syndrome, 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, legionellosis, Rocky Mountain spotted fever, invasive MRSA infection, and tuberculosis and the lowest rates of pertussis and shigellosis. In this age group, no cases of hemolytic uremic syndrome, acute hepatitis C, Kawasaki syndrome, measles, mumps 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, invasive *Haemophilus influenzae* infection, HIV infection, meningococcal disease, invasive *Streptococcus pneumoniae* in children less than 5 years old, and early syphilis. Incidence rates for the white population did not exceed the rates among the race groups for any reportable condition in 2008 where race was known for at least 80% of cases. The "other" race group had the highest rate for tuberculosis. The two cases of Q fever both occurred in the white population, while the two cases of hemolytic uremic syndrome occurred as one each in the black population and the white population.

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 listeriosis were notably higher among females in 2008. In addition, the one reported measles case and two reported Q fever cases occurred in females. Incidence rates were higher among males for AIDS, amebiasis, ehrlichiosis, acute hepatitis B, HIV infection, malaria, mumps, and early syphilis. All three reported cases of Kawasaki syndrome in 2008 occurred in males.

REGION – The northwest health planning region had the highest incidence rates for campylobacteriosis, legionellosis, meningococcal disease, pertussis, rabies in animals, salmonellosis, and invasive group A streptococcal disease compared to the other regions of the state. The lowest incidence rates for chickenpox, acute hepatitis B, HIV infection, and early syphilis were seen in this region. No cases of hemolytic uremic syndrome, Kawasaki syndrome, measles, or typhoid fever were reported from the northwest region.

The northern health planning region experienced the highest incidence rates for amebiasis, Shiga toxin-producing *Escherichia coli* infection, giardiasis, hepatitis A, Lyme disease, malaria, tuberculosis, and typhoid fever. The lowest incidence rates for *Chlamydia trachomatis* infection, gonorrhea, invasive *Haemophilus influenzae* infection, acute hepatitis C, influenza, elevated blood lead levels in children, meningococcal disease, rabies in animals, Rocky Mountain spotted fever, invasive MRSA infection, and invasive *Streptococcus pneumoniae* in children less than 5 years old were reported from the northern region. No cases of hemolytic uremic syndrome, acute hepatitis C, or Kawasaki syndrome were reported from this region. In addition, the one measles case was reported from the northern region.

The southwest health planning region had the highest incidence rates for cryptosporidiosis, ehrlichiosis, acute hepatitis B, listeriosis, and invasive *Streptococcus pneumoniae* in children less than 5 years old. It had the lowest rates for AIDS, amebiasis, giardiasis, malaria, pertussis, shigellosis, tuberculosis, and *Vibrio* infection. There were no cases of amebiasis, malaria, measles, Q fever or *Vibrio* infection reported from the southwest region. The two cases of hemolytic uremic syndrome in 2008 were reported from the southwest region.

The central health planning region experienced the highest rates for AIDS, chickenpox, influenza, elevated blood lead levels in children, Rocky Mountain spotted fever, shigellosis, invasive MRSA infection, and early syphilis. The lowest rates for campylobacteriosis, cryptosporidiosis, Shiga toxin-producing *Escherichia coli* infection, and Lyme disease were seen in this region. No cases of arboviral infection, hemolytic uremic syndrome, Kawasaki syndrome, measles, mumps, or Q fever were reported from the central region.

The eastern health planning region had the highest incidence rates for *Chlamydia trachomatis* infection, gonorrhea, HIV infection, and *Vibrio* infection. This region experienced the lowest rates for ehrlichiosis, hepatitis A, legionellosis, and salmonellosis. No cases of arboviral infection, hemolytic uremic syndrome, measles, mumps, Q fever, or typhoid fever were reported from the eastern region.

ONSET – A few diseases showed distinct seasonal trends. The largest proportion of influenza cases (91%) occurred during the first quarter of the year. The largest proportion of invasive *Haemophilus influenzae* infection (59%), meningococcal disease (66%), and invasive group A streptococcal disease (59%), occurred during the first and second quarters. The second and third quarters accounted for the largest proportion of cases of ehrlichiosis (94%), Shiga toxin-producing *Escherichia coli* infection (75%), Lyme disease (75%), malaria (80%), Rocky Mountain spotted fever (91%), salmonellosis (61%), typhoid fever (90%), and *Vibrio* infection (97%). The largest proportions of hepatitis A (41%) and listeriosis (41%) cases had onset during the third quarter. In addition, the three cases of arboviral infection reported in 2008 all had onset during the third quarter. The largest proportion of pertussis cases (59%) occurred during the third and fourth quarters, while the largest proportion of HIV infections (37%) and shigellosis cases (47%) occurred during the fourth quarter. More than 10% of the AIDS, chickenpox, *Chlamydia trachomatis* infection, acute hepatitis C, HIV infection, mumps, invasive *Streptococcus pneumoniae* in children less than 5 years old, and early syphilis cases reported in 2008 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 2008 are likely to have reduced the number of reported cases in the fourth quarter.

Table 1. Reportable Diseases in Virginia, 2008

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
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's 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