

## Acquired Immunodeficiency Syndrome (AIDS)

See Human Immunodeficiency Virus (HIV)

## Amebiasis

Agent: *Entamoeba histolytica* (parasite)

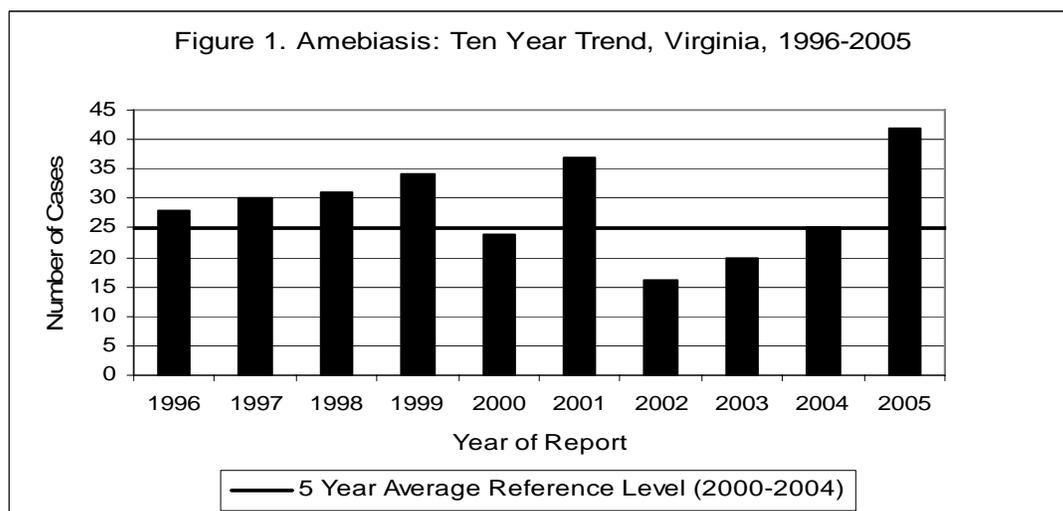
Mode of Transmission: Ingestion of food contaminated with amebic cysts or by direct contact with fecal material from infected animals or people.

Signs/Symptoms: Most infections are asymptomatic. Symptomatic infections include diarrhea, which may become severe, bloody or with mucus; lower abdominal pain; straining to pass stool or urine; weight loss; fever; chills; and constipation. Symptoms may become chronic.

Prevention: Careful hand hygiene after each toilet visit and before preparing and eating food.

Other Important Information: Invasive amebiasis is mostly a disease of young adults and children under two years of age.

During 2005, 42 cases of amebiasis were reported in Virginia. This is an increase of 68% from the 25 cases reported in 2004 and a 72% increase from the five year average of 24.4 cases per year. It marks the third year in a row of increasing numbers of cases (Figure 1).



The 30-39 year age group had the highest incidence rate, with 1.0 case per 100,000 population. This was followed by the 10-19 year age group (0.8 per 100,000 population). No cases occurred in infants. No race was reported for 50% of cases. Among cases with a reported race, the black population had a much higher incidence rate than the white population (1.1 and 0.1 per 100,000, respectively). A higher incidence rate was reported in the male population (0.8 per 100,000) than in the female population (0.3 per 100,000). The highest number of cases (18) occurred in the northern region, which also had the highest incidence rate (0.9 per 100,000). This was followed by the southwest and central regions (8 cases, 0.6 per 100,000 for each region). The other regions

reported few cases and had incidence rates of 0.2 to 0.4 per 100,000. The largest proportion of cases (41%) occurred during the fourth quarter of the year.

## **Anthrax**

Agent: *Bacillus anthracis* (spore forming bacteria)

Mode of Transmission: Through direct contact with contaminated animal products; ingestion of contaminated, undercooked meat; and inhalation of spores in risky industrial practices (e.g., processing wool of hides) or through an intentional bioterrorism release.

Signs/Symptoms: Exposure through direct contact presents as a lesion that often develops a black scab. Symptoms of abdominal distress (nausea, vomiting, diarrhea, fever) are present in intestinal anthrax. Symptoms of inhalation anthrax are initially nonspecific (fever, cough, chest pain) but will lead to respiratory distress and death if untreated.

Prevention: Minimize contact with infected animals and animal products. A vaccine is available to immunize high-risk individuals.

Other Important Information: Person-to-person transmission is very rare. The period of time from exposure to onset of symptoms ranges from 1 to 60 days. Anthrax is classified as a potential bio-weapon because it can cause serious public health problems, it can be spread across a large area, and it requires a great deal of planning to protect the public's health.

No cases of anthrax were reported in Virginia during 2005. In 2001, two Virginia residents were reported with inhalation anthrax due to an intentional release of *Bacillus anthracis* spores through the U.S. Postal Service. Both individuals were exposed at their work place and both survived. These were the first reported cases of anthrax in Virginia since 1970.

## **Arboviral Infection**

Agent(s): In Virginia: West Nile virus (WNV), LaCrosse encephalitis (LAC) virus, Eastern equine encephalitis (EEE) virus, and St. Louis encephalitis (SLE) virus.

Mode of Transmission: Most common is by the bite of an infected mosquito. West Nile virus may also be transmitted by blood transfusion or transplanted organs from infected donors, by cuts or punctures by contaminated scalpels or needles and, more rarely, by inhalation or ingestion of dust or particles from infected bird feces.

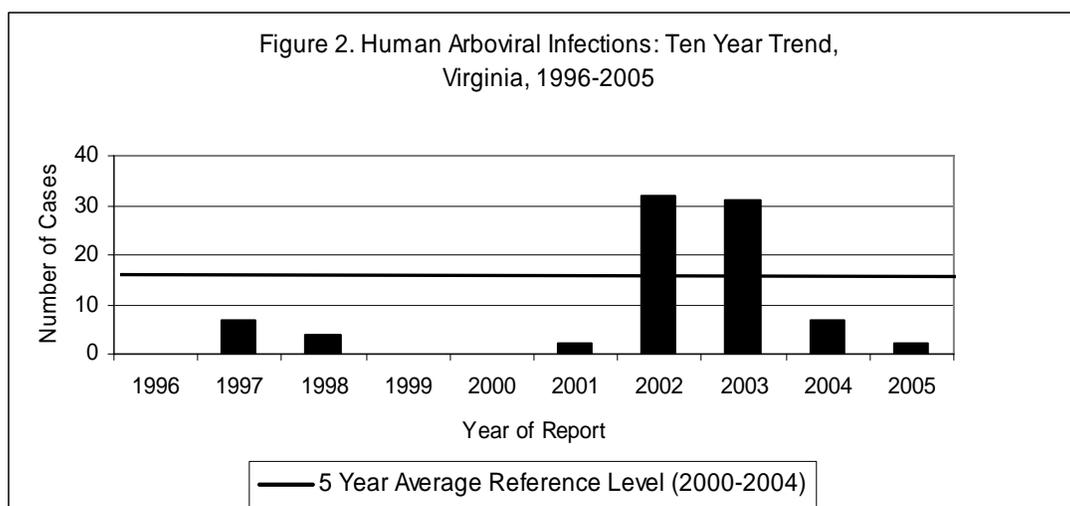
Signs/Symptoms: Can range from no symptoms to death, depending on the particular virus and characteristics of the infected person. More severe disease can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord).

Prevention: Avoid being bitten by mosquitoes. Avoid areas infested by mosquitoes and when in those areas, avoid being bitten by wearing long sleeved, loose fitting, light colored clothing (mosquitoes are not attracted to light colors) and mosquito repellents. Maintain screens on all open windows and doors. Around your home, eliminate or dump all containers that could hold water and breed mosquitoes.

Other Important Information: WNV infections are more likely to cause severe disease in older persons, but the majority of infections result in no symptoms. LAC is seen primarily in children under 19 years of age. EEE is more likely to affect children and older people and has a high death rate; all age groups are equally at risk for developing SLE.

## Human

Five cases of human arboviral infection were reported in 2005. This is a 29% decrease from the 7 cases reported in 2004 and an 84% decrease from the 31 cases reported in 2003 (Figure 2). The elevated levels in 2002 and 2003 were largely attributable to the emergence of WNV in Virginia. During 2005, four (80%) of the arboviral cases were due to LAC and one (20%) was due to WNV infection. This is a dramatic drop in WNV cases from the 5 reported in 2004 and 26 reported in 2003. The low number (one case) of WNV infections reported in Virginia during 2005 may be due to several factors: more summer rainfall (which can flood out mosquito breeding grounds); below average temperatures (which can slow the rate at which mosquitoes develop infections that can be transmitted to humans); better mosquito control efforts; increased use of personal protection measures to ward off mosquito bites; and a decreased level of suspicion for WNV infections by physicians, leading to less testing, and therefore, less reporting of WNV cases.



All four LAC cases were under age 19, the age group at greatest risk for this disease. The WNV infection occurred in a person in the 50 year and older age group. All the cases were seen in the white population. Females and males had the same incidence rate (0.1 per 100,000, each). This is a change from previous years in which males had higher incidence rates than females. Most regions had at least one case and rates ranged between 0.0 and 0.2 per 100,000. Arboviral infections, especially WNV, increase during the summer months and early fall when people are more commonly exposed to infected mosquitoes. This is a national trend which is reflected in Virginia.

## Animal

Zoonotic surveillance for WNV is conducted each year on mosquitoes, sentinel chickens, birds, and horses. Surveillance for EEE is also conducted on mosquitoes, sentinel chickens, and horses, but not on wild birds. During 2005, over 481,000 mosquitoes were tested and 319 mosquito pools (trappings of many mosquitoes) were positive for WNV and 132 were positive

for EEE. In 2005, 1 horse was found to have WNV infection and 6 were found to have EEE. A total of 37 sentinel chicken flocks were tested by serology every other week from May to October. Of the approximately 172 sentinel chickens tested through the season, 7 were positive for WNV and 95 were positive for EEE. Testing of 67 wild birds yielded 16 WNV positive birds.

## **Botulism**

Agent: Neurotoxin produced by the spore forming organism *Clostridium botulinum* (bacteria)

Mode of Transmission: Foodborne botulism occurs when *Clostridium botulinum* is allowed to grow and produce toxin in food which is then eaten without sufficient heating to inactivate the toxin. In intestinal (infant) botulism, ingested spores germinate, multiply and produce toxin in the intestine.

Signs/Symptoms: Foodborne symptoms include, fatigue, weakness, vertigo, and sometimes diarrhea and vomiting. Descending, flaccid paralysis can also occur, which may lead to cessation of breathing and death unless respiration is aided. Intestinal botulism cases show weakness, loss of appetite, an altered cry and loss of head control.

Prevention: All canned and preserved food should be properly processed and prepared. Boiling food for 10 minutes will destroy the toxin, but much higher temperatures are required to kill the spores. Honey and corn syrup should not be given to children younger than 12 months of age.

Other Important Information: The case-fatality rate is 5%-10%. Botulism is listed as a potential bio-weapon because an aerosolized or foodborne botulinum toxin weapon could cause severe disease and would require swift public health action to control.

## **Foodborne**

No cases of foodborne botulism were reported in Virginia during 2005. The last reported case occurred in 2002. It occurred in an infant but was determined to be foodborne botulism, not infant botulism. *Clostridium botulinum* toxin type A was not found in a stool specimen, but was found in home-canned baby food.

## **Intestinal (Infant)**

One case of intestinal botulism was reported in Virginia during 2005. The annual average for the preceding five years is 2.6 cases. The 2005 case was a white male from the eastern region. Disease onset occurred during the second quarter of the year.

## **Brucellosis**

Agent: *Brucella* species (bacteria)

Mode of Transmission: Contamination of skin wounds with infected animal tissue or body fluids, ingestion of unpasteurized milk or milk products, and inhalation of the organism.

Signs/Symptoms: Intermittent and irregular fever, headache, chills, sweating, and muscle pain.

Prevention: Use rubber gloves when handling animal tissue. Do not consume unpasteurized dairy products, especially milk, cheese, or ice cream.

**Other Important Information:** Listed by the Centers for Disease Control and Prevention (CDC) as a category B bioterrorism agent (i.e., organism may be relatively easy to disseminate, may cause moderate injury and/or death, and may need enhanced surveillance for detection).

One case of brucellosis was reported in 2005. The case was a male in the 50 years and older age group from the northern region. He had recently traveled to Mexico where he reported drinking raw goat milk.

## **Campylobacteriosis**

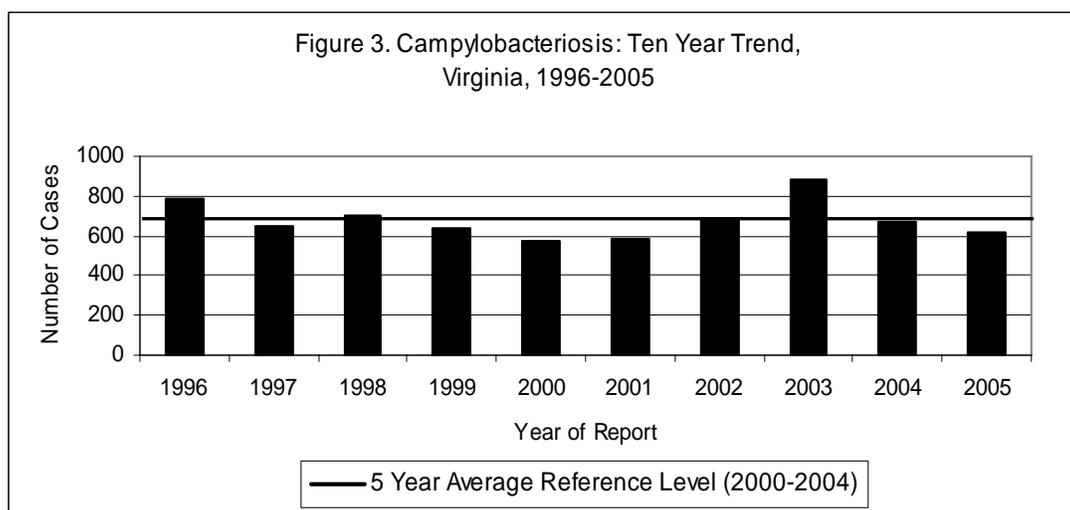
**Agent:** *Campylobacter* species (bacteria)

**Mode of Transmission:** Ingestion of contaminated food or direct contact with fecal material from infected animals or people.

**Signs/Symptoms:** Includes diarrhea (frequently with bloody stools), abdominal pain, malaise, fever, nausea and/or vomiting. In neonates and young infants, bloody diarrhea without fever may be the only manifestation of illness. Rarely, post-infectious complications include reactive arthritis, febrile convulsions or Guillain-Barré Syndrome.

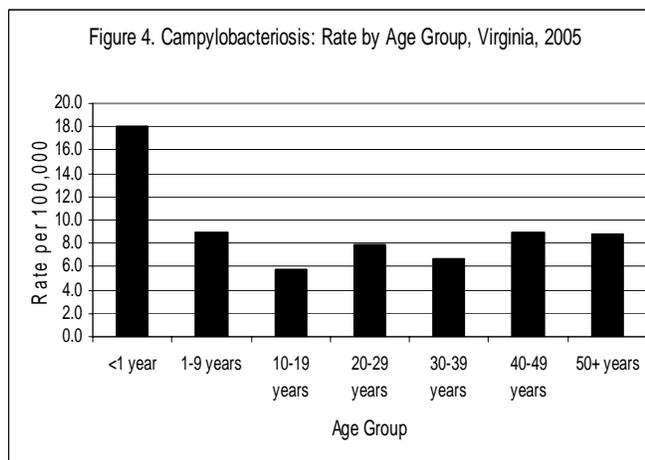
**Prevention:** Careful hand hygiene after each toilet visit, before preparing and eating food and after contact with feces of dogs and cats is critical. Pasteurization of milk and chlorination of water supplies are important. Thoroughly cook all foods containing eggs and meats, particularly poultry.

During 2005, 618 cases of campylobacteriosis were reported in Virginia. This is a 9% decrease from the five year average of 678.6 cases per year, and an 8% decrease from the 668 cases reported in 2004 (Figure 3).



The highest rate of infection occurred in infants (18.0 per 100,000). Rates in the other age groups ranged between 5.7 and 9.0 per 100,000 (Figure 4). Race was missing for 39% of reported campylobacteriosis cases. Among cases for which race was reported, the white population had an incidence rate more than three times that of the black population (6.1 versus 2.0 per 100,000).

Males had a higher rate (9.3 per 100,000) than females (6.6 per 100,000). By region, the northwest had the highest rate of this disease (11.2 per 100,000). The other regions reported rates between 6.5 and 9.6 per 100,000. Cases occurred throughout the year, but the largest proportion (35%) had onsets during the months of July to September.



## **Chickenpox (Varicella)**

Agent: Varicella-zoster virus

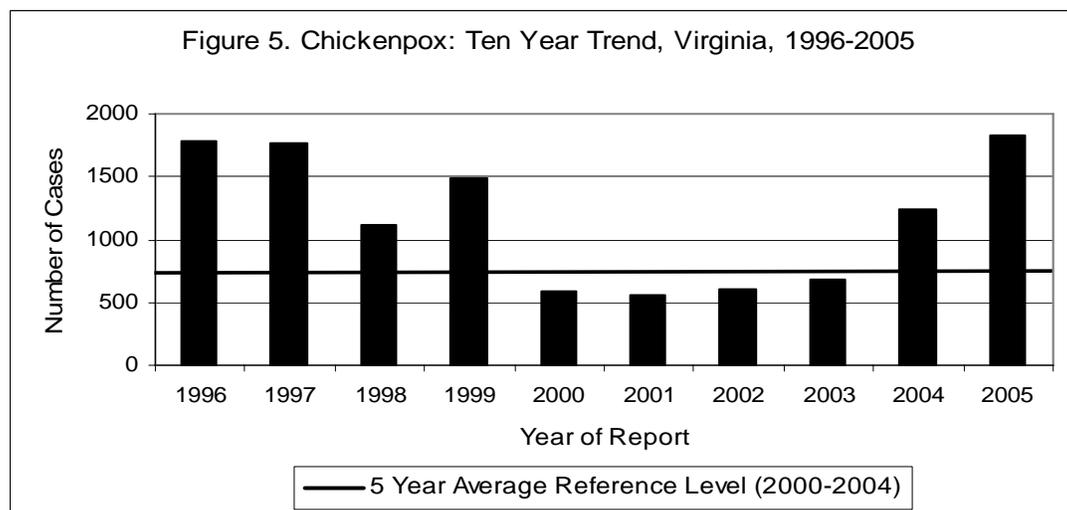
Mode of Transmission: Person-to-person through droplet or airborne spread of respiratory secretions from an infected person.

Signs/Symptoms: Acute onset of mild fever and skin eruptions. The skin lesions can appear on the scalp, armpit, and mucous membrane of the mouth and respiratory tract.

Prevention: Vaccination of children age 12 months or older followed by a second dose at age 4-6 years.

Other Important Information: The disease is highly transmissible; susceptible household contacts have an 80%-90% risk of becoming infected.

There were 1,834 cases of chickenpox reported in Virginia during 2005. This is 48% increase from 2004 and a 149% increase over the five year average of 736.4 cases per year (Figure 5). The increase in cases seen since 2002 may be attributed to a greater amount of reporting by physicians and schools.



Varicella vaccine was licensed in 1995, and in 1999 vaccination became a requirement for entry into school or day care in Virginia for all children born on or after January 1, 1997. However, outbreaks of chickenpox continued to occur despite high vaccination coverage, as the vaccine is 80%-85% effective in preventing infection.

The majority of cases were reported in those less than 20 years of age. The 1-9 year age group had the highest incidence rate (127.8 per 100,000). This was followed by the 10-19 year age group (52.7 per 100,000) and the less than 1 year age group (50.9 per 100,000). The other age groups had between 0.2 cases per 100,000 (50 years and older age group) and 5.1 cases per 100,000 (20-29 year age group). The white population had a slightly higher rate than the black population (20.3 versus 17.3 per 100,000, respectively). The male and female populations had similar rates (25.6 and 23.2, respectively).

The northwest region reported the highest incidence rate (30.6 per 100,000). This was followed closely by the other regions, with rates between 21.9 and 24.6 cases per 100,000. Cases occurred throughout the year with the largest proportion of cases (38%) occurring during the fourth quarter. There were 60 outbreaks of chickenpox reported in 2005. Most occurred during October and November (22 outbreaks). All but three outbreaks were reported in schools. The other outbreaks occurred in a jail, a chicken processing company and an apartment building. One death due to chickenpox was reported in 2005. The individual, an unvaccinated college student on immunosuppressive medication, died despite aggressive medical interventions.

### **Chlamydia trachomatis Infection**

Agent: *Chlamydia trachomatis* (bacteria)

Mode of Transmission: Person to person via sexual transmission, or from the genital tract of an infected mother to her infant during birth.

Signs/Symptoms:

**Men:** Urethritis, with discharge, itching, and burning upon urination.

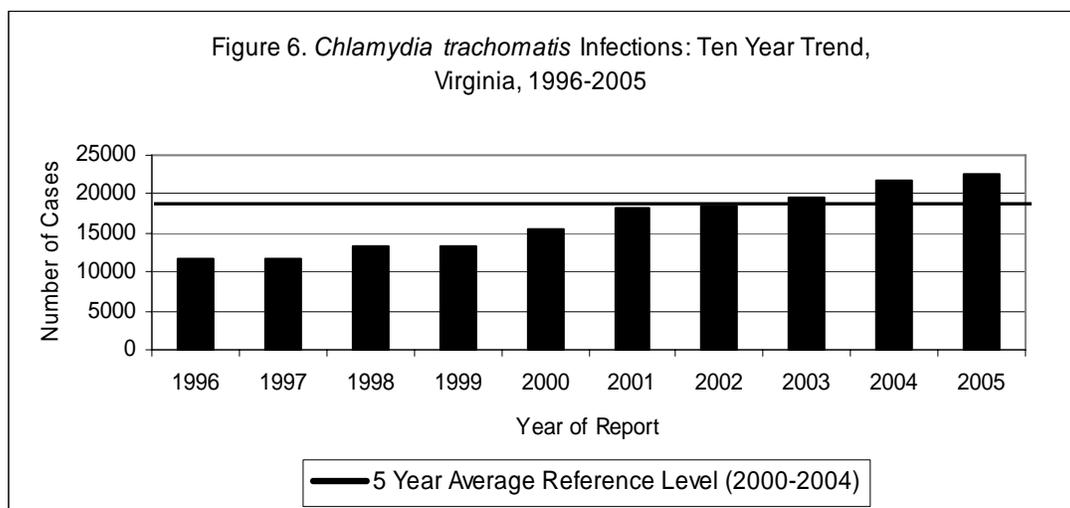
**Women:** Cervical inflammation with discharge, fluid buildup, and easily induced vaginal bleeding.

**Infants:** Infections of the eyes and respiratory tract.

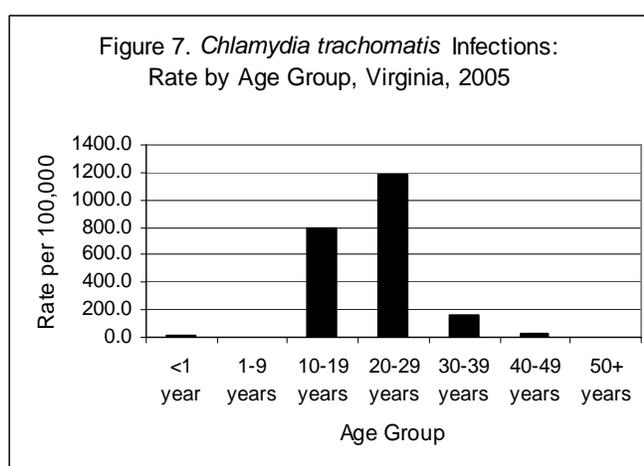
Prevention: Safe sexual practices; screening of young women 20 to 24 years of age; annual presumptive treatment for *Chlamydia* infection among sexually active adolescents.

Other Important Information: Approximately 70% of infected women are asymptomatic.

During 2005, a total of 22,668 cases of *C. trachomatis* infection were reported in Virginia. Reported cases of this disease have been steadily increasing since 1997, and the number of cases reported in 2005 is a 22% increase over the five year average of 18,656 cases per year (Figure 6). Even these high numbers are most likely an underestimate because many cases are asymptomatic, those diagnosed with other sexually transmitted infections (e.g., gonorrhea) may be presumptively treated for *C. trachomatis* infection and are not counted, and screening has been limited to high-risk females and the male partners of infected women. This testing pattern is also reflected in the difference in the rates for females and males.



The highest rates were in the 20-29 year age group (1187.1 per 100,000), followed by the 10-19 year age group (791.4 per 100,000) (Figure 7). Within these age groups, infections are highest in the 15-24 year age population. Lower rates in the older age groups are attributed to changes in behaviors and to the development of partial immunity due to repeated exposures at younger ages. Nineteen cases were reported in the less than 1 year age group (19.0 per 100,000), eighteen of which were confirmed to have *C. trachomatis* eye infections (see Ophthalmia Neonatorum section).



The incidence rate in the black population was more than nine times the rate in the white population (878.9 versus 95.5 per 100,000, respectively). The central and eastern regions reported the highest incidence rates (398.2 and 505.6 per 100,000, respectively). No seasonal trend was observed.

## **Creutzfeldt-Jakob Disease**

**Agent:** Believed to be caused by a prion protein.

**Mode of Transmission:** The majority of cases are sporadic, with no known cause. A small percentage of cases, 5%-15%, may be due to heredity or exposure to organ tissue contaminated with the prion. A form of the disease, variant CJD (vCJD), is thought to be transmitted through ingestion of beef from cattle infected with bovine spongiform encephalopathy (BSE, or mad cow disease).

**Signs/Symptoms:** Symptoms may begin with confusion and dementia, progressing to a wide range of neurological signs and symptoms, including loss of coordination.

**Prevention:** Avoid organ and tissue transplants from infected individuals. For protection against variant CJD, the federal government has regulations in place to prevent the spread of BSE in the United States.

**Other Important Information:** vCJD occurs in younger individuals, while sporadic CJD occurs more often in older individuals and has a slower progression. In Virginia, CJD is reportable when it occurs in persons under 55 years of age.

No cases of Creutzfeldt-Jakob disease in persons less than 55 years of age were reported in Virginia during 2005. The last reported case occurred in 2002. No cases of vCJD have been identified in Virginia residents. From 1995 through 2005 only one case of vCJD was reported in a U.S. resident. Before onset of illness, the person had lived in the United Kingdom during a period when the population was at increased risk of exposure to BSE.

## **Cryptosporidiosis**

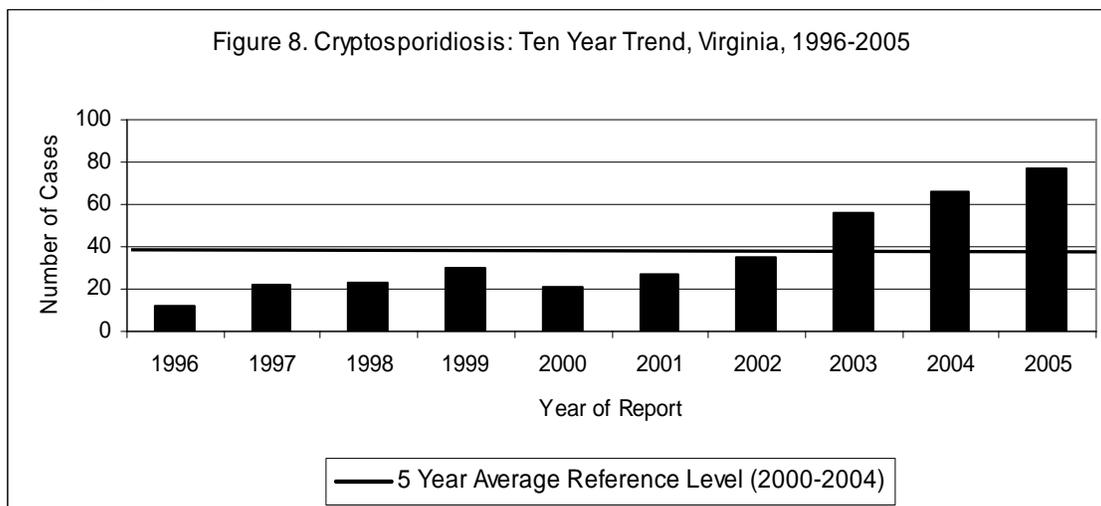
**Agent:** *Cryptosporidium parvum* (parasite)

**Mode of Transmission:** Occurs via the fecal-oral route and can include person to person, animal to person, foodborne and waterborne transmission. *Cryptosporidium* oocytes can remain infectious for 2-6 months after being excreted from infected individuals. The oocytes are very resistant to chemicals used to purify drinking water.

**Signs/Symptoms:** Profuse watery diarrhea with cramping and abdominal pain. The diarrhea may be preceded by anorexia and vomiting in children. Cryptosporidiosis can also be asymptomatic.

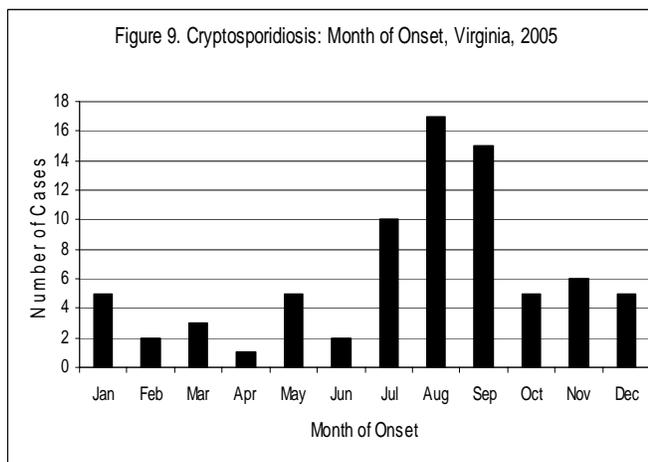
**Prevention:** Careful hand hygiene after each toilet visit and before preparing and eating food. People with diarrhea should not enter public recreational water. Do not drink water from streams, lakes, springs or any unknown source. Water purification methods, including boiling water or filtration, should be considered when drinking water from natural or unknown sources.

Seventy-seven cases of cryptosporidiosis were reported in Virginia during 2005. This is a 17% increase in cases from 2004 and an 88% increase in cases from the five year average of 41 cases per year (Figure 8).



Cases of cryptosporidiosis have been increasing since 2000. In 2005, the highest incidence rate occurred among infants with 4 cases (4.0 per 100,000). The highest number of cases (26) and the second highest incidence rate (3.0 per 100,000) were reported in the 1-9 year age group. The other age groups had rates between 0.4 and 1.1 per 100,000. Twenty-two percent of cases had no race reported, but among those with a reported race, the black and white populations had similar rates of infection (0.7 and 0.9 per 100,000, respectively).

The female and male populations had similar rates of infection (1.0 and 1.1 per 100,000, respectively). By region, the highest incidence rate was reported from the southwest (2.8 per 100,000), followed by the northwest (1.7 per 100,000). The other regions had rates between 0.2 and 0.7 per 100,000. A seasonal trend was observed in onset of cases; 55% occurred during the third quarter of the year (Figure 9).



## **Cyclosporiasis**

Agent: *Cyclospora cayetanensis* (parasite)

Mode of Transmission: Can be foodborne or waterborne. *Cyclospora* are resistant to chlorination. Direct person-to-person transmission has not been documented.

Signs/Symptoms: Profuse watery diarrhea commonly occurs, along with nausea, vomiting, anorexia, substantial weight loss, abdominal bloating or cramping and prolonged fatigue. Fever occurs in approximately half the patients.

Prevention: Fresh produce should be washed thoroughly before it is consumed.

Three cases of cyclosporiasis were reported during 2005. This is an increase from the one case reported in 2004, but the same as the number of cases reported in 2003. One case was reported in the 20-29 year age group and two cases were in the 50 years and greater age group. All three cases were in the white population. Two cases were from the northern region and one was from the southwest region. Cases occurred during the first and second quarters of the year. Two of the cases were related and reported eating fresh berries and lettuce together within the two weeks prior to becoming ill. One case had recently eaten unwashed fruits and lettuce in Mexico.

## **Diphtheria**

Agent: Toxin secreted by strains of the bacterium *Corynebacterium diphtheriae*

Mode of Transmission: Person to person via droplet spread. Rarely, transmission may occur from contact with skin lesions or articles soiled with discharges from lesions of infected persons.

Signs/Symptoms: Sore throat, anorexia, nasal discharge, and formation of a bluish-white, grayish-green, or black adherent membrane in the throat. More severe cases can include swelling of the neck and airway passages.

Prevention: Diphtheria vaccination beginning at 2 months of age. Antibody levels wane over time making booster doses necessary every 10 years, beginning at age 11-12.

Other Important Information: The overall case-fatality rate for diphtheria is 5%-10%, with higher death rates in young children and those over 40 years of age.

In Virginia, no cases of diphtheria were reported during 2005. The last reported case in Virginia occurred in 1989. Nationally, 0-5 cases of diphtheria are reported each year.

## **Ehrlichiosis**

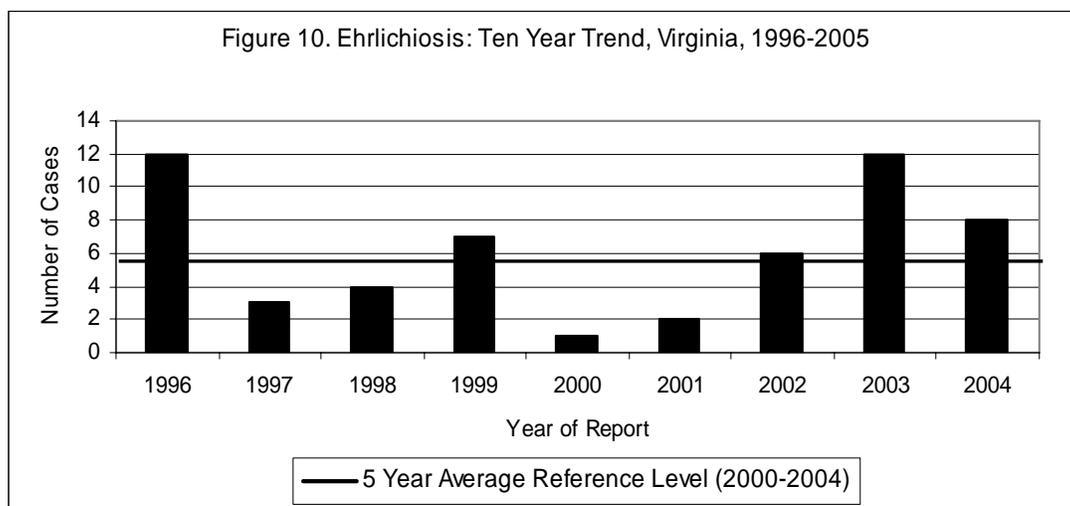
Agent(s): *Ehrlichia chaffeensis* and *E. ewingii* cause human monocytic ehrlichiosis (HME) and *Anaplasma phagocytophilum* causes human granulocytic anaplasmosis (HGA), formerly known as human granulocytic ehrlichiosis (HGE). All are bacteria.

Mode of Transmission: Through the bite of an infected tick. *Ehrlichia chaffeensis* and *E. ewingii* may infect adult or nymphal lone star ticks and *Anaplasma phagocytophilum* may infect adult or nymphal deer ticks. All of these pathogens may be transmitted to humans when an infected tick bites a human and stays attached (feeding) for a period of more than 24 hours.

Signs/Symptoms: Usually non-specific but commonly include fever, headache, nausea, anorexia, vomiting, and muscle pain. Untreated cases may result in prolonged fever, renal failure, respiratory distress, seizures, coma and death. Inflammation of the brain and the lining around the brain and spinal cord develops in 20% of patients with HME, but is very rare with HGA.

Prevention: Avoid being bitten by ticks. Avoid tick prone habitats such as humid forest environments with dense undergrowth and/or heavy leaf litter; tall weeds along forest margins, tree lines, forest trails and forest clearings. When in tick prone habitats, wear light colored clothing with pants legs tucked into socks. Apply permethrin based repellants to clothing and DEET, Picaridin, or Oil of Lemon Eucalyptus based repellents to exposed areas of skin. Thoroughly check your body for ticks after visiting tick prone habitats and remove attached ticks as soon as possible.

Thirteen cases of ehrlichiosis were reported in Virginia during 2005. This is a 63% increase from the 8 cases reported in 2004, and over a 100% increase from the five year average of 5.8 cases per year (Figure 10).



The 50 year and older age group had the highest incidence rate (0.4 per 100,000), followed by the 40-49 year age group (0.2 per 100,000). One case each was reported in the 20-29 and 30-39 year age groups. No cases were reported from the other age groups. All cases occurred in the white population and females had a similar incidence rate (0.1 per 100,000) to males (0.2 per 100,000). The eastern region had the highest incidence rate, 0.6 per 100,000. The other regions had rates between 0 and 0.1 per 100,000. Over 90% of cases occurred during the months of April-September. No cases occurred during the months of January-March. One death due to ehrlichiosis was reported in 2005.

### **Escherichia coli Infection, Shiga Toxin-Producing**

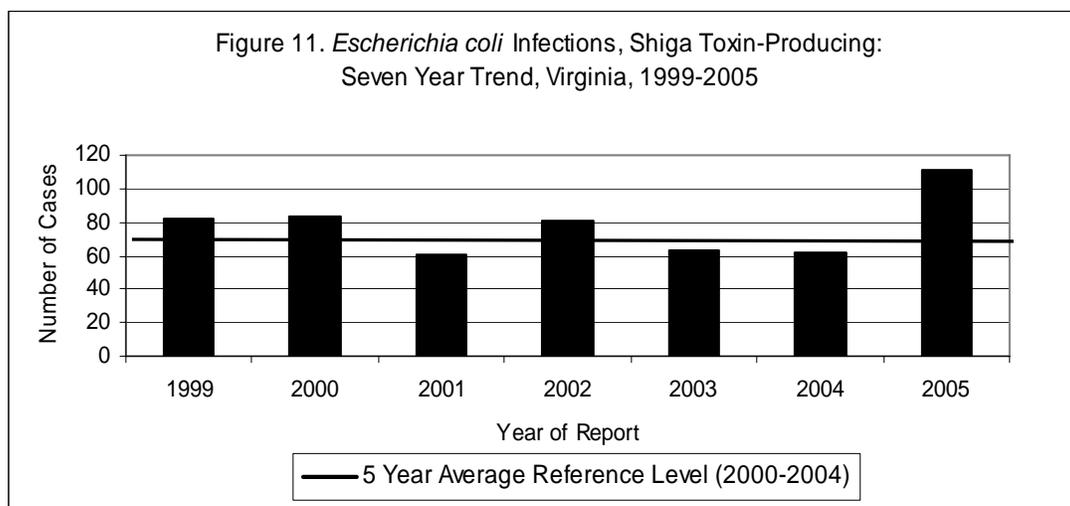
**Agent:** Shiga toxin-producing *Escherichia coli* (bacteria)

**Mode of Transmission:** From food or water contaminated with human or animal feces, or person to person from infected symptomatic people or from carriers. Fomites and contaminated environment may also play a role in transmission.

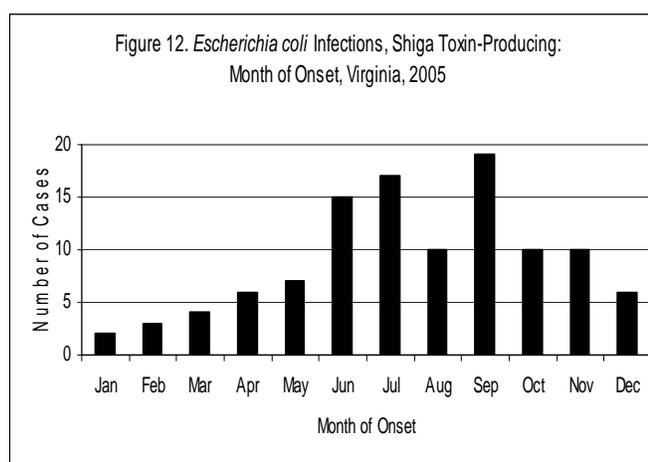
**Signs/Symptoms:** Non-bloody to completely bloody diarrhea and severe abdominal cramps with little or no fever. In some people, including children under 5 years of age and the elderly, the infection can cause a complication called hemolytic uremic syndrome (HUS), in which the red blood cells are destroyed and the kidney fails.

**Prevention:** Careful hand hygiene after each toilet visit and before preparing and eating food. All ground beef should be cooked thoroughly until no pink meat remains and the juices are clear. Raw milk and unpasteurized apple juice products should not be consumed.

Shiga toxin-producing *E. coli* infections have been a reportable condition in Virginia since 1999. During 2005, 111 cases were reported in Virginia. This is 59% increase from the five year average of 70 cases per year (Figure 11).



The highest incidence rates were in children less than 10 years old: 4.8 per 100,000 in the 1-9 year age group and 4.0 per 100,000 in infants. The other age groups had incidence rates between 0.6 and 2.2 per 100,000. Thirty-nine percent of cases did not have a reported race; however, among those with a race reported, the rate in the white population (1.1 per 100,000) was approximately twice the rate in the black population (0.5 per 100,000). Females and males had similar rates (1.5 and 1.4 per 100,000, respectively).



The northern region reported the highest incidence rate (2.1 per 100,000), followed by the northwest (1.7 per 100,000) and central (1.6 per 100,000) regions. Cases occurred more often in the warmer months than in the colder months of the year (Figure 12).

## Giardiasis

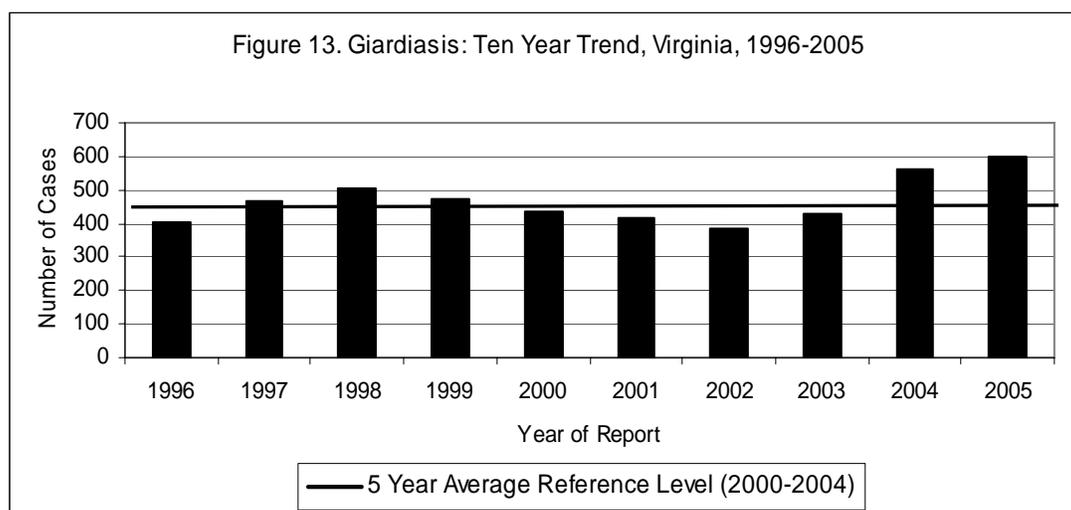
Agent: *Giardia lamblia* (parasite)

Mode of Transmission: Person to person transmission by hand-to-mouth transfer of cysts from the feces of an infected person. Localized outbreaks are more often due to ingestion of cysts in fecally contaminated drinking and recreational water than from fecally contaminated food. Another source is unfiltered stream and lake waters open to contamination by human and animal feces.

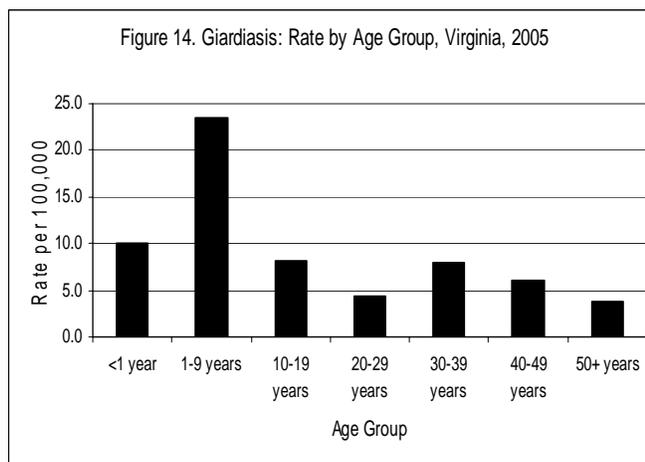
Signs/Symptoms: Symptoms may include diarrhea, abdominal pain, bloating, nausea and vomiting. A person may be asymptomatic or develop chronic illness.

**Prevention:** Careful hand hygiene after each toilet visit and before preparing and eating food. Do not drink recreational water or untreated water from shallow wells, lakes, rivers, springs, ponds and streams.

There were 602 cases of giardiasis reported in Virginia during 2005. This is a 35% increase from the five year average of 445.8 cases per year and a 7% increase from the 563 cases reported in 2004 (Figure 13). While this disease follows a cyclical trend, the increase over the last few years is more substantial than the small increase seen in the 1996-1998 period. The increase in 2004 and 2005 is associated with the identification of asymptomatic carriers among refugees from African countries settling in Virginia.



In 2005, the highest incidence rate was reported in the 1-9 year age group (24.6 per 100,000), followed by the less than one year age group with a rate of 10.0 per 100,000 (Figure 14). The lowest rate, 3.7 per 100,000, occurred in the 50 years and older age group. Rates in the other age groups ranged between 4.3 and 8.1 per 100,000. Over one-third of cases had no reported race, but among those with a reported race, the black population had an incidence rate more than three times that of the white population (11.8 versus 3.6 per 100,000). The rate in the other race category was the lowest (0.4 per 100,000). A higher rate was reported in the male population (8.1 per 100,000) than the female population (7.5 per 100,000). The highest rate (10.2) was seen in the southwest region. Rates in the other regions ranged from a low of 4.9 in the eastern region to a high of 9.2 in the northern region. No seasonal trend was observed.



## Gonorrhea

Agent: *Neisseria gonorrhoeae* (bacteria)

Mode of Transmission: Sexually transmitted through direct contact with infected areas.

Signs/Symptoms:

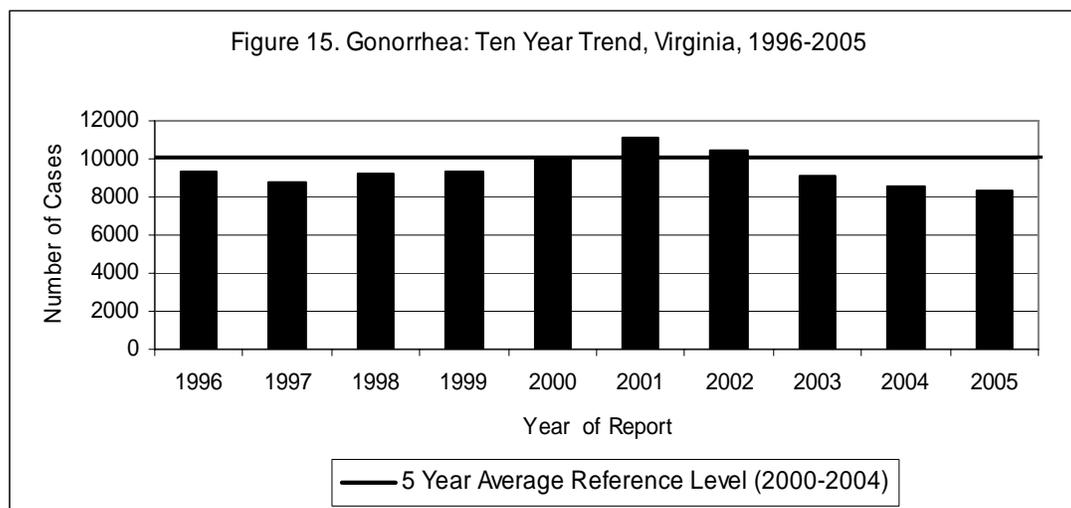
**Men:** Discharge from the urethra.

**Women:** Usually asymptomatic, although it may cause vaginal discharge or bleeding after intercourse.

Prevention: Safe sexual practices and ensuring that infected sexual contacts are treated.

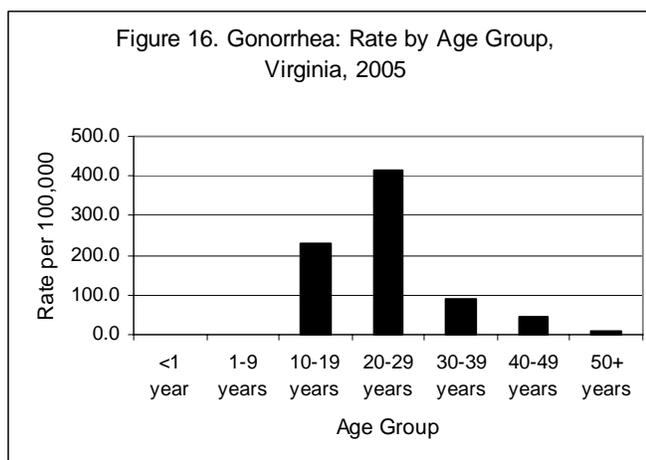
Other Important Information: In 2004, the CDC stopped recommending fluoroquinolones as a first-line treatment of gonorrhea in men who have sex with men (MSM) because of an increase in fluoroquinolone resistance. For more information see: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5316a1.htm>

During 2005, 8,346 cases of gonorrhea were reported in Virginia, a slight (2%) decrease from the 8,565 cases reported in 2004, which marks the fourth year in a row of decreasing numbers of cases (Figure 15). According to the CDC, gonorrhea is substantially under diagnosed and under reported, and approximately twice as many new infections are estimated to occur each year as are reported.



The highest incidence rate was in the 20-29 year age group (414.0 per 100,000), followed by the 10-19 year age group (230.6 per 100,000) (Figure 16). Within these age groups, incidence rates were highest among those age 15-24 years. Seventy-seven percent of reported cases were in the black population (incidence rate of 430.6 per 100,000). The large difference by race can also be seen at the national level; in 2004, the black population had a rate 20 times the rate in the white population in the United States.

The rate in the female population was slightly higher than the rate in the male population (116.2 versus 107.3 per 100,000, respectively). The eastern region had the highest rate of infection in 2005 (200.1 per 100,000), followed by the central region (195.0 per 100,000). The other regions had rates between 33.6 and 83.1 per 100,000. No seasonal trend was observed.



## **Granuloma Inguinale**

Agent: *Calymmatobacterium granulomatis* (bacteria)

Mode of Transmission: Direct contact with lesions, usually during sexual activity. Young children can be infected by contact with infectious secretions.

Signs/Symptoms: Skin lesions that eventually form fibrous tissue. This is a chronic condition that can lead to destruction of genital organs and spread to other parts of the body through autoinoculation.

Prevention: Sexual partners should be examined, counseled to practice safe sex, and offered antimicrobial therapy when needed.

No cases of granuloma inguinale were reported in Virginia during 2005. The last reported case occurred in 2001.

## **Haemophilus influenzae Infection, Invasive**

Agent: *Haemophilus influenzae* (bacteria)

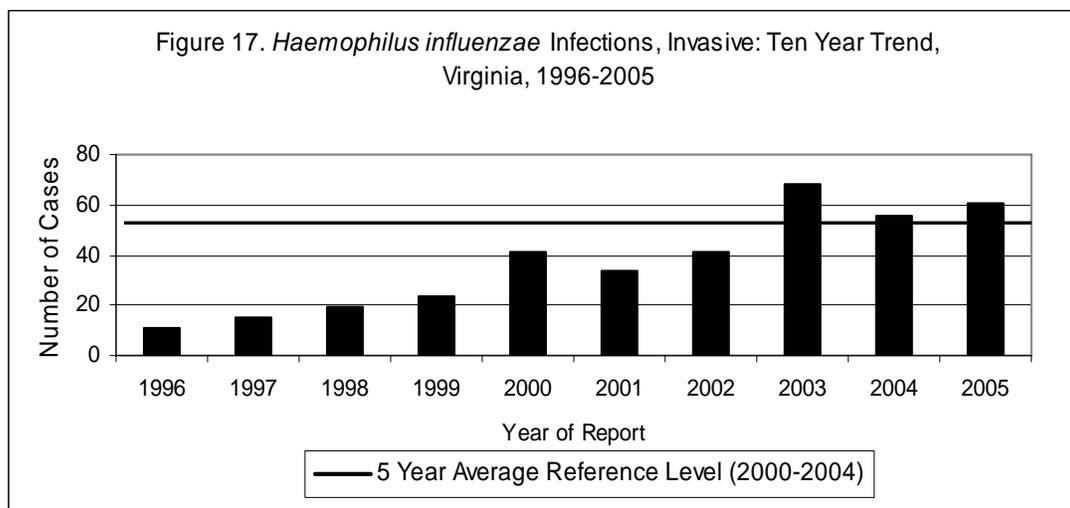
Mode of Transmission: Person to person by inhalation of respiratory droplets or direct contact with nose and throat discharge during the infectious period.

Signs/Symptoms: Inflammation of the lining of the brain and spinal cord, inflammation of the epiglottis (may lead to blockage of upper airway and death), pneumonia, skin infection, arthritis, or blood stream infection.

Prevention: Vaccination with *Haemophilus influenzae* type b (Hib) conjugate vaccine beginning at 2 months of age.

Other Important Information: Since the licensure of conjugate Hib vaccine in the late 1980s, the incidence of invasive Hib disease has declined by >99% compared with the pre-vaccine era.

Sixty-one cases of invasive *H. influenzae* infection were reported in Virginia during 2005. This is a 9% increase from the 56 cases reported in 2004, and a 27% increase from the five year average of 48 cases per year (Figure 17).



Infants had the highest incidence rate (7.0 per 100,000), followed by the 50 year and older age group (1.5 per 100,000). The other age groups had rates between 0.2 and 0.5 per 100,000. Eighteen percent of cases had no race reported, but among those with a reported race, the black and white populations had similar rates of infection (0.9 and 0.6 per 100,000, respectively). Both females and males had incidence rates of 0.8 per 100,000. The northwest region had the greatest number of cases (17) and highest incidence rate (1.5 per 100,000). The other regions had rates between 0.3 and 1.1 per 100,000. Cases occurred throughout the year with the highest percentage (33%) occurring in the first quarter. Three deaths due to *H. influenzae* infection were reported during 2005.

## **Hantavirus Pulmonary Syndrome**

Agent: Hantavirus family

Mode of Transmission: Several different types of hantaviruses have been identified and each is associated with a different rodent species. Rodents infected with hantavirus do not become ill but they can transmit the virus to humans when their urine and feces are aerosolized and inhaled.

Signs/Symptoms: Fever, muscle pain, and gastrointestinal complaints followed by an abrupt onset of respiratory distress and decreased blood pressure. Respiratory failure and shock follow quickly.

Prevention: Exclude rodents from houses and other buildings. Disinfect rodent-contaminated areas with a spray disinfectant solution prior to cleaning. Contaminated areas should be cleaned with a wet mop and not be vacuumed or swept. Use approved respirators to avoid inhalation of dust when cleaning previously unoccupied areas.

Other Important Information: Although most common in the southwestern part of the country, hantavirus infections can occur anywhere.

Since May of 1993, when the syndrome was first recognized, there have been 379 cases of hantavirus pulmonary syndrome (HPS) in the United States resulting in 136 deaths (36%). No cases of this disease were reported in Virginia during 2005. The only hantavirus case reported in Virginia occurred in 1993. In 2004, a resident of southwest Virginia died due to HPS following an exposure that occurred in West Virginia. For surveillance purposes, that case is attributed to West Virginia.

## **Hemolytic Uremic Syndrome**

Agent: Serious sequelae associated with infection with the Shiga toxin-producing bacteria, such as *Escherichia coli* or *Shigella*.

Mode of Transmission: See section on *E. coli* Infection, Shiga Toxin-Producing or Shigellosis.

Signs/Symptoms: Kidney failure (often requiring dialysis) as well as neurological impairment (e.g., stroke or seizures). Eight percent of persons with diarrhea due to *E. coli* O157:H7 develop this syndrome, which occurs during the first two weeks after onset of diarrhea.

Prevention: See section on *E. coli* Infection, Shiga Toxin-Producing or Shigellosis.

One case of hemolytic uremic syndrome (HUS) was reported in 2005 in a female child (<10 years old) from the northwest region. Only one case was reported in 2004 as well. This represents a steady decrease in HUS from the eight cases reported in 2002.

## **Hepatitis A**

Agent: Hepatitis A virus (Picornaviridae family)

Mode of Transmission: Person to person by direct contact with fecal material from infected animals or people. Important vehicles for transmission include food or water contaminated by infected animals or people.

Signs/Symptoms: Fever, malaise, nausea, abdominal discomfort, and jaundice. In older children and adults, symptoms usually occur for several weeks, though prolonged or relapsing disease can last up to six months. Younger children often exhibit no symptoms.

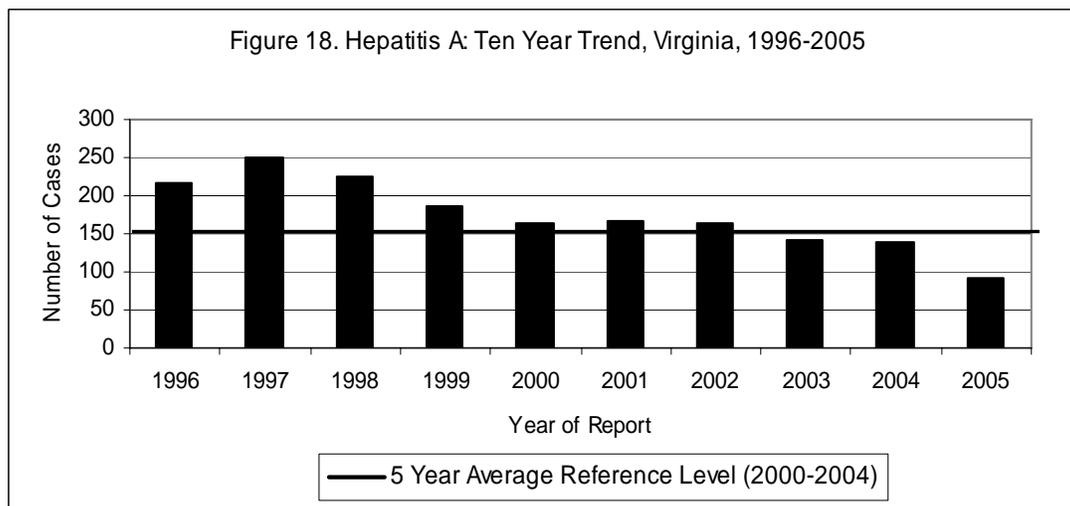
Prevention: Safe food preparation, good personal hygiene (e.g., washing hands with soap after diaper changes in child care settings), and immunization. Administering Immune Globulin (IG) after exposure to hepatitis A can protect against symptomatic infection.

Other Important Information: This is an acute illness only, chronic infection does not occur.

During 2005, 93 cases of hepatitis A infection were reported in Virginia, a 34% decrease from the 140 cases reported in 2004 and a 40% decrease from the five year average of 155 per year (Figure 18). This continues a downward trend that began in the late 1990s. A decreasing trend can also be seen at the national level. There were 31,032 hepatitis A cases reported in 1996 in the U.S., while only 5,683 were reported in 2004.

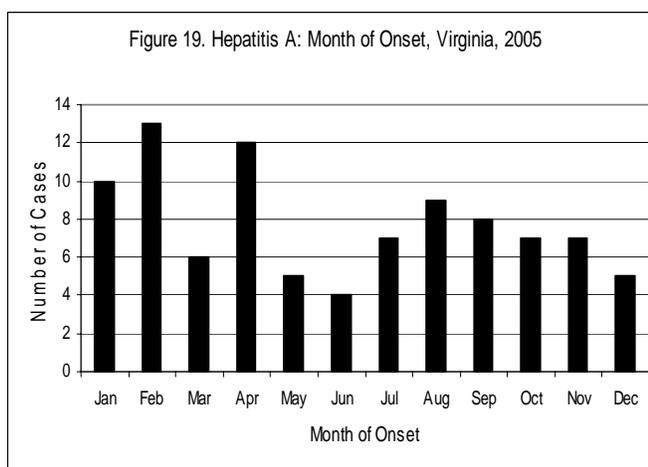
The highest incidence rate occurred in the 1-9 year age group (2.0 per 100,000). Two cases in this age group were involved in person-to-person transmission of hepatitis A in an elementary school kindergarten class. The rate in the 1-9 year age group was followed by 10-19 year olds

(1.5 per 100,000). The other age groups had incidence rates between 0 (infants) and 1.3 per 100,000.



Twenty-two percent of reports had missing race data. Among cases with a race reported, the black and white populations had similar incidence rates (1.1 and 1.0 per 100,000, respectively).

Females and males had similar rates of infection (1.1 and 1.3 per 100,000, respectively). By region, the northern region had the highest incidence rate (2.3 per 100,000). The other regions had rates between 0.6 and 1.2 per 100,000. Cases occurred throughout the year, with onset of one-third of cases during the first quarter (Figure 19).



## **Hepatitis B, Acute**

**Agent:** Hepatitis B virus (Hepadnavirus)

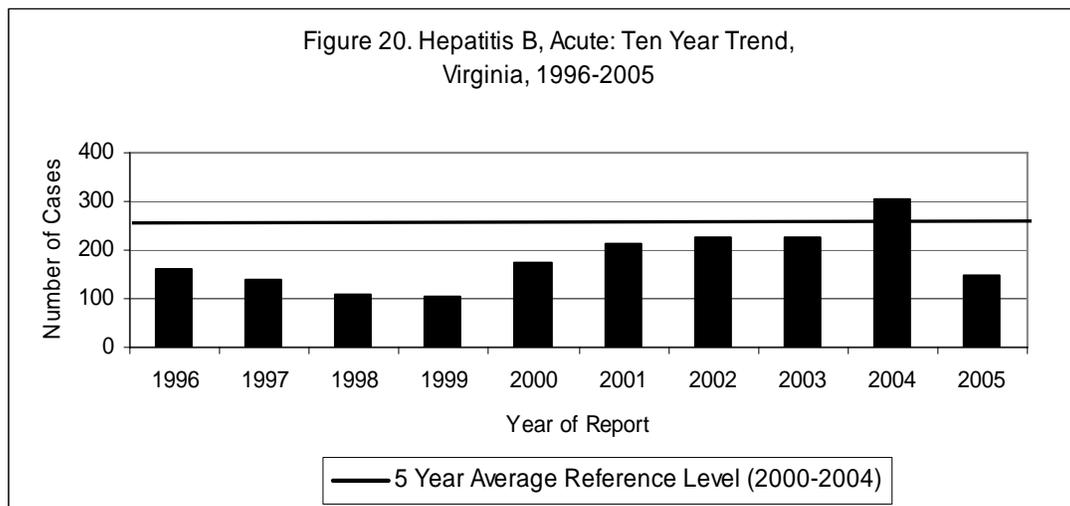
**Mode of Transmission:** Person to person by blood or body fluid exposure (e.g., sexual, perinatal, or through the skin, such as during injection drug use).

**Signs/Symptoms:** Fever, general feeling of illness, nausea, abdominal pain, and jaundice. Infection can be asymptomatic, and the likelihood of developing symptoms is age dependent.

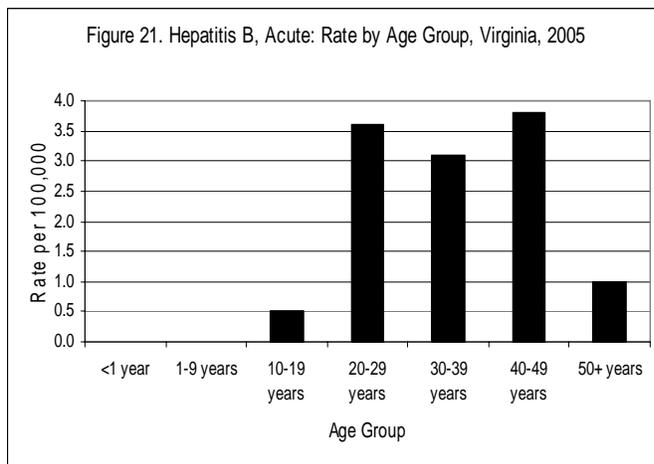
**Prevention:** Strategies include: 1) immunization of people at increased risk of infection; 2) screening of all pregnant women and treatment of children born to positive women; 3) routine immunization of infants; 4) routine immunization of adolescents who have not been previously immunized; and 5) screening of donated blood and organs.

**Other Important Information:** Infection with hepatitis B virus may lead to chronic (long-term) infection. Death from liver disease occurs in 15%-25% of those with chronic infection.

During 2005, 146 cases of acute hepatitis B infection were reported in Virginia. This represents a 52% decrease from the 303 reports in 2004 and a 36% decrease from the five year average of 228.2 cases per year (Figure 20).



The highest incidence rates were in adults between the ages of 20-49 years (3.6 to 3.8 per 100,000) (Figure 21). Thirty-six percent of reports were missing race. Among cases with a race reported, the rate in the black population was twice the rate in the white population (2.2 and 1.1 per 100,000, respectively). A slightly higher incidence rate was reported in the male population (2.1 per 100,000) than in the female population (1.8 per 100,000). The southwest region had the highest rate of acute hepatitis B cases (3.1 per 100,000), followed by the central region (2.7 per 100,000). An outbreak of hepatitis B (2 cases) was reported in an assisted living facility in July. One death due to hepatitis B was reported during 2005.



## **Hepatitis C, Acute**

Agent: Hepatitis C virus (HCV) (Flaviviridae family)

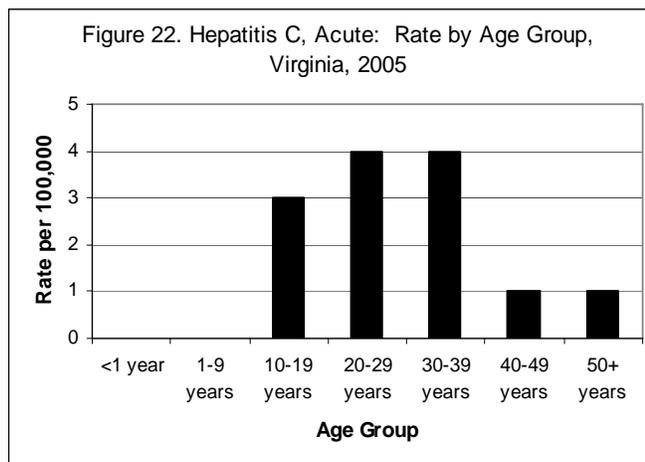
Mode of Transmission: Person to person through perinatal transmission; through the skin, such as during injection drug use; or (rarely) through sexual exposure to blood or body fluids.

Signs/Symptoms: Loss of appetite, nausea, abdominal discomfort, or jaundice.

Prevention: Avoid injection drug use and unprotected intercourse.

Other Important Information: Only 10% of new infections cause symptoms, but 80% of new infections become chronic, resulting in carriers capable of spreading infection. As people with chronic HCV infection age, they are at higher risk for developing chronic liver disease, cirrhosis, and liver cancer.

Thirteen cases of acute hepatitis C infection were reported in Virginia during 2005. This is slightly less than the 15 cases reported during the preceding three years. Incidence rates were highest in the 20-29 and 30-39 year age groups (0.4 per 100,000 each), followed by the 10-19 year age group (0.3 per 100,000). No cases were reported among children less than age nine years (Figure 22). Similar rates of acute disease were reported for the black and white populations (0.1 and 0.2 per 100,000, respectively) and females and males had the same rate (0.2 per 100,000, each). The largest proportion of cases occurred in the southwest region (6 cases, 0.5 per 100,000). The other regions reported rates between 0.1 and 0.3 per 100,000. The largest proportion of cases (69.3%) had onset during the first two quarters of the year.



## **Human Immunodeficiency Virus (HIV) Infection and Acquired Immunodeficiency Syndrome (AIDS)**

Agent: Human Immunodeficiency Virus (retrovirus)

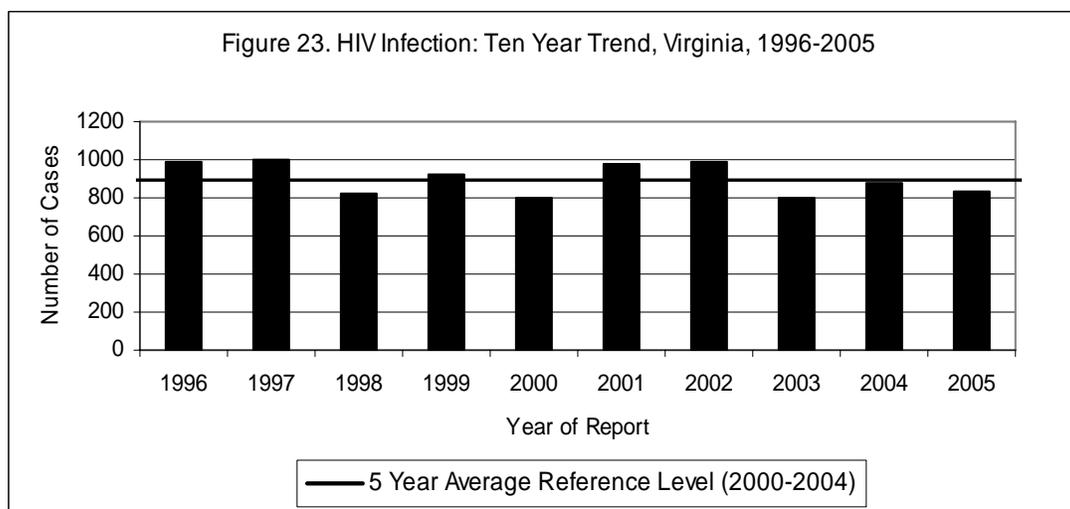
Mode of Transmission: Person to person via unprotected intercourse, contact of cut or abraded skin with body secretions carrying the virus, use of contaminated needles, blood transfusions and transplants with organs from infected donors, or from mother to child before or during birth and through breastfeeding.

Signs/Symptoms: Initial infection with HIV can cause an acute illness of fever, muscle pain, and sore throat, after which the person can be asymptomatic for several years. Eventually the immune system is affected, causing AIDS.

Prevention: Safe sexual practices; screening of blood and plasma; and among infected mothers, antiretroviral prophylaxis, cesarean delivery before labor, and avoidance of breastfeeding.

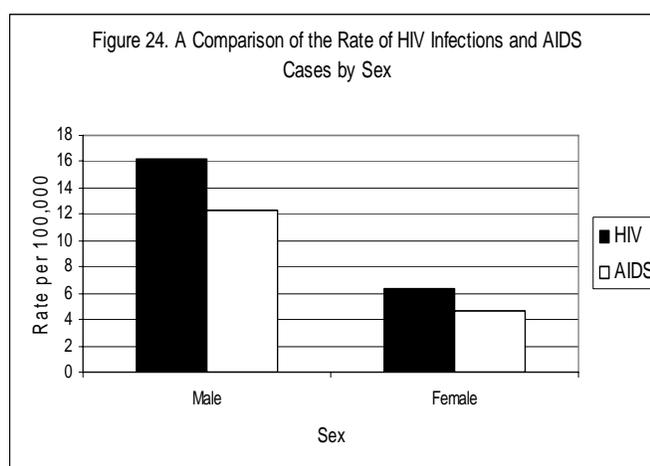
**Other Important Information:** Rapid tests (which provide results within 30 minutes) are becoming more widely available and are used at some testing sites in Virginia. For more information, see: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5524a2.htm> or call your local health department.

During 2005, 833 cases of HIV infection were reported in Virginia. This is a 5% decrease from the number of cases reported in 2004 and a 6% decrease from the five year average of 889 cases per year (Figure 23).



Similar rates of infection were reported in the 20-29 and 30-39 year age groups (23.2 and 23.7 per 100,000, respectively). The 40-49 year old population followed, with an incidence rate of 16.5 per 100,000. The other age groups had rates between 0 per 100,000 (infants) and 5.1 per 100,000 (50 year and older group). The rate in the black population (34.3 per 100,000) was more than 8 times that of the white population (4.2 per 100,000). Incidence in the other race group was 1.9 per 100,000. There was also a difference by sex; the

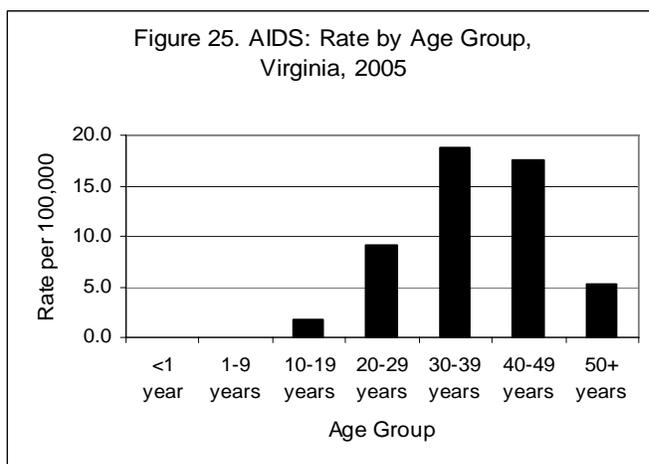
rate in males was more than twice that in females (16.2 versus 6.3 per 100,000) (Figure 24). The central and eastern regions reported the highest incidence rates (16.7 and 14.8 per 100,000, respectively), followed by the northern region with a rate of 11.6 per 100,000.



## AIDS

Prior to 1996, it was estimated that about 50% of people infected with HIV would develop AIDS within 10 years; however, this interval increased with the introduction of anti-viral medications.

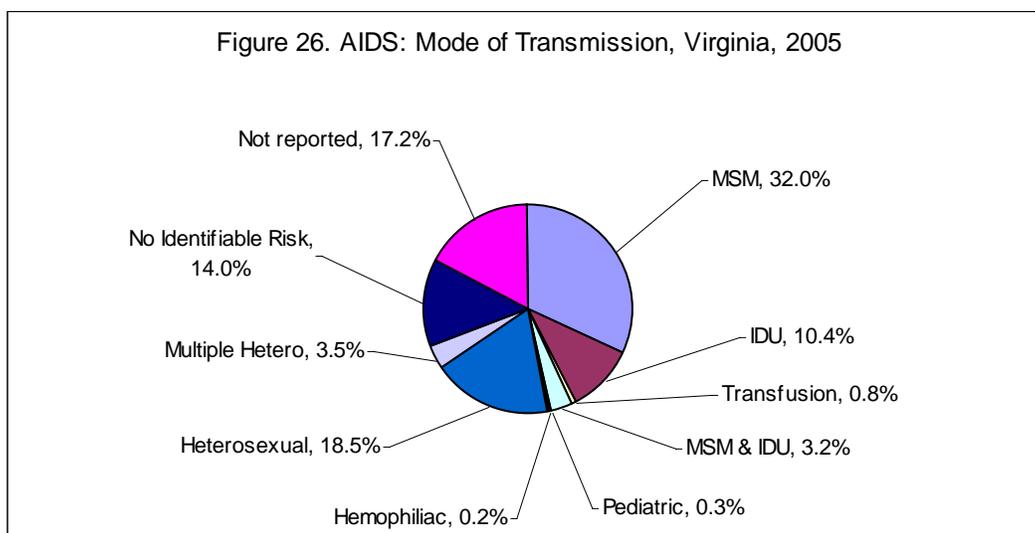
The annual number of new AIDS cases reported in Virginia decreased for the fourth consecutive year (from 970 cases reported in 2001 to 626 reported in 2005). The highest incidence rate was



reported in the 30-39 year old age group (18.8 cases per 100,000 population), followed by the 40-49 year age group (17.6 cases per 100,000 population) (Figure 25.) Similar to HIV, the AIDS incidence rate in the black population was more than 8 times that in the white population (26.2 versus 3.0 per 100,000, respectively). Likewise, the male population had a much higher rate (12.3 per 100,000) than the female population (4.6 per 100,000) (Figure 24). The eastern and central regions reported similar rates of AIDS (10.4 and 10.9 per 100,000,

respectively), followed by the northern region (9.7 cases per 100,000 population).

The most common modes of transmission among those diagnosed with AIDS in 2005 were men having sex with men (MSM) (32%), followed by heterosexual contact (18%), no identifiable risk (14%) and intravenous drug use (IDU) (10%) (Figure 26).



## Influenza

Agent: The influenza virus; types A, B and (rarely) C cause human disease.

Mode of Transmission: Person to person primarily through infected persons coughing or sneezing.

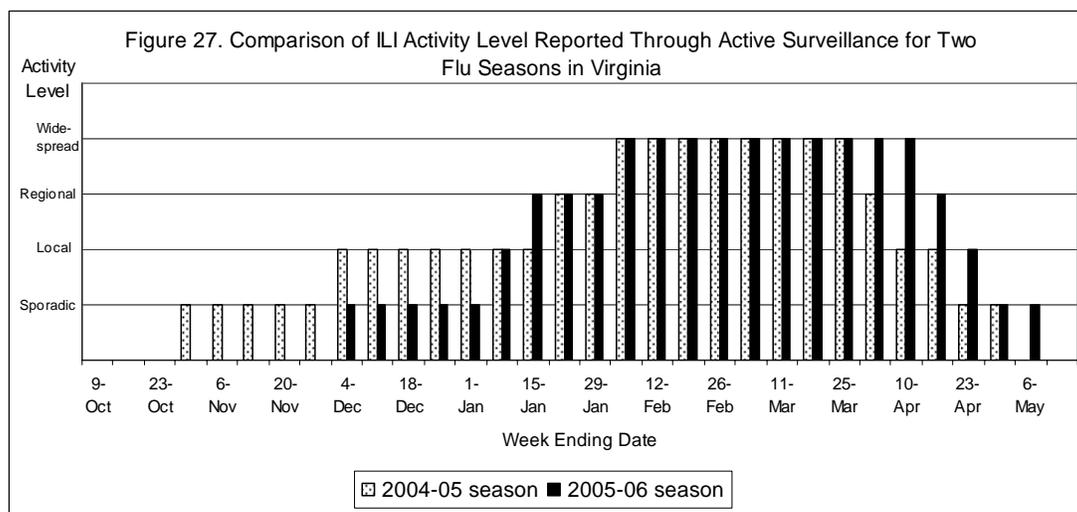
Signs/Symptoms: Fever, headache, muscle pain, exhaustion, sore throat and cough; influenza can also lead to pneumonia and can complicate existing health conditions (e.g., lung or heart disease).

Prevention: Annual vaccination is the primary prevention strategy; antiviral medications are sometimes used with high-risk populations (e.g., nursing home residents) to prevent illness. Transmission may be reduced by frequent hand washing; avoidance of touching the eyes, nose, and mouth with contaminated hands; and covering the nose and mouth with a tissue when coughing or sneezing.

Other Important Information: The influenza virus changes slightly from year to year (antigenic drift), making it necessary to prepare a new vaccine each year. Periodically, the virus will change to form a completely new subtype (antigenic shift) which can lead to pandemics.

In Virginia, influenza generally begins to increase in November and starts to decrease in March or April. During that time, the Virginia Department of Health conducts active surveillance with sentinel physicians around the state who report the weekly number of cases of influenza-like illness (ILI) seen at their office. An ILI case is defined as any person with a fever greater than or equal to 100° F and a cough and/or sore throat in the absence of another known cause. Six weeks of baseline data are collected and a threshold level is determined. The influenza activity level for the state is assigned based on the number of regions above threshold level. Levels, in order of progressing severity, include: sporadic, local, regional, and widespread.

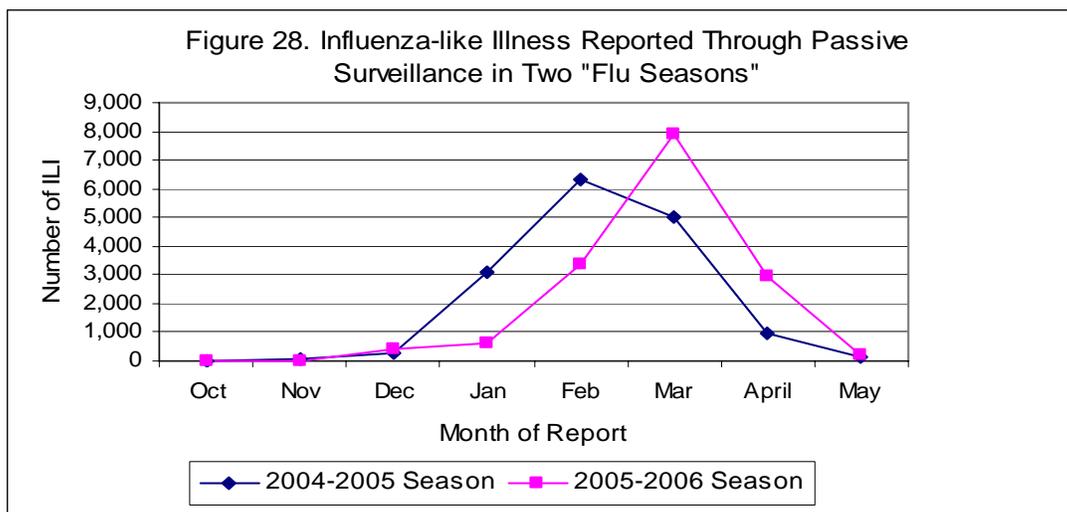
Virginia began collecting baseline data for the 2004-2005 influenza season in October, and active data collection continued through April (Figure 27).



Of the 388 specimens tested by the Division of Consolidated Laboratories (DCLS), 130 were influenza A and 17 were influenza B. Subtyping showed 80 of the positive influenza A were type A (H3). Seventeen influenza A (H3) virus isolates were further subtyped at the Centers for Disease Control and Prevention (CDC) with the following results: 8 influenza A/California/07/2004 (H3N2), 5 influenza A/Korea/770/2002 (H3N2), and 4 influenza A/Wyoming/03/2003 (H3N2).

For the 2005-2006 season, baseline ILI numbers were collected beginning in October and peak activity occurred in early March. There were 92 positive influenza specimens confirmed at DCLS by direct immunofluorescence (DFA), culture, or both. Eighty-four (91%) were influenza A and 6 (7%) were influenza B.

Influenza is also reported through a passive surveillance system throughout the calendar year. Overall, more cases of influenza-like illness and laboratory confirmed influenza were reported in the 2005-2006 season than the 2004-2005 season (Figure 28).



Peak activity occurred between early February and late March during the 2004-2005 season. During 2005 forty-one outbreaks of influenza were reported to VDH from various facilities, including nursing homes/assisted living centers (34), training center (1), residential facility (2), treatment center (1), rehabilitation center (1), correctional facility (1), and school (1). (See Tables 9 and 10 on pages 52-59). Two pediatric deaths due to influenza were reported in 2005. One occurred in a pre-school aged child (0-4 years) and one occurred in a young school age child (5-12 years).

## **Kawasaki Syndrome**

**Agent:** Unknown – toxin or infectious agent suspected.

**Mode of Transmission:** Unknown.

**Signs/Symptoms:** High fever, rash, swelling of the hands and feet, irritability, conjunctivitis, swollen lymph nodes, inflammation of mouth/lips/throat.

Prevention: Unknown.

Other Important Information: Children less than five years of age make up approximately 80% of cases worldwide.

Nineteen cases of Kawasaki syndrome were reported in Virginia during 2005. This is an increase of 19% from the 16 cases reported in 2004, but no change from the five year average of 19 cases per year. All cases were reported in children less than 10 years of age. The black population had a slightly higher rate (0.3 per 100,000) than the white population (0.2 per 100,000). A slightly higher incidence rate was reported in the female population (0.3 per 100,000) than in the male population (0.2 per 100,000). The eastern region reported the highest incidence rate with 0.5 cases per 100,000 population followed by the southwest region (0.4 per 100,000). The lowest rate (0.0 per 100,000) occurred in the northwest region. Cases had onset throughout the year.

## **Lead - Elevated Blood Levels in Children**

Agent: Lead (metal)

Mode of Transmission: Chewing objects painted with lead paint; ingesting contaminated dust, soil or water; or using glassware, healthcare products or folk remedies containing lead.

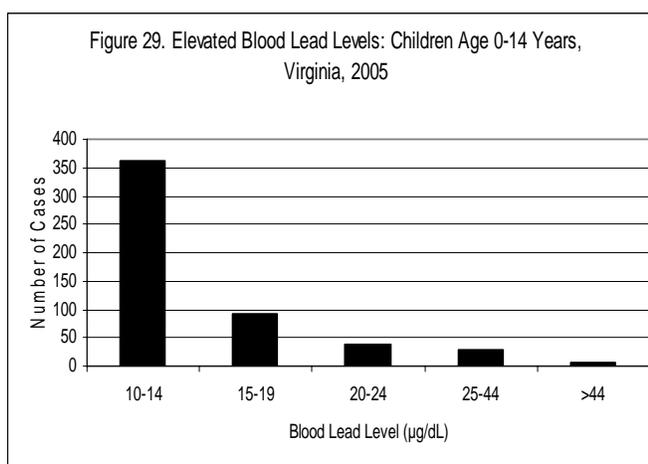
Signs/Symptoms: Even at low levels, lead in children can cause nervous system damage, learning disabilities, behavior problems, muscle weakness, decreased growth, hearing damage, or anemia.

Prevention: Avoid ingestion of lead-contaminated materials or use of lead-containing objects. Education of healthcare professionals and parents is important in reducing and detecting lead exposure.

Other Important Information: The primary source of lead for children is exposure to deteriorated paint in housing built before 1978. There is an increased awareness of new sources of lead exposures, including candies popular among some ethnic groups; traditional Hispanic, Indian, and Middle Eastern folk remedies; and ceramics from foreign countries.

Virginia law requires reporting of elevated blood lead levels ( $>9 \mu\text{g/dL}$ ). There were 529 cases of elevated blood levels reported in children less than 15 years old during 2005. This is a significant decrease (25%) from the five-year average of 707.6 cases per year. Blood lead levels (BLL) in the 10-14  $\mu\text{g/dL}$  range are above normal but require no treatment. BLL in the 15-19  $\mu\text{g/dL}$  range require nutritional education and more frequent screening, while a finding in the range of 20-24  $\mu\text{g/dL}$  requires medical and environmental

evaluation and environmental remediation. Levels of greater than 24  $\mu\text{g/dL}$  require medical and environmental interventions. Among children with elevated blood lead levels, 363 cases (69%) fell in the 10-14  $\mu\text{g/dL}$  range, 91 cases (17%) fell in the 15-19  $\mu\text{g/dL}$  range, 38 cases (7%) fell in



the 20-24  $\mu\text{g/dL}$  range, and 30 cases (6%) fell in the 25-44  $\mu\text{g/dL}$  range. Seven children (1%) had lead levels greater than 44  $\mu\text{g/dL}$  (Figure 29).

The majority of elevated blood lead levels and the highest rates were reported in 1-9 year olds (482 cases, 54.8 per 100,000). This was followed by infants (29.9 cases per 100,000 population) and 10-15 year olds (3.3 cases per 100,000 population). Twenty-seven percent of reports were missing race data, including twenty reports (4%) that reported Hispanic as a race. Among reports with a race, the black population had an incidence rate more than four times that of the white population (63.3 versus 13.5 per 100,000, respectively). The other race category had an incidence rate of 2.3 per 100,000. The male population had a higher incidence rate (38.7 per 100,000) than the female population (31.8 per 100,000). The central region had the highest incidence rate of elevated lead blood levels in children, with 68.0 cases per 100,000 population. This was followed by the southwest region with 46.2 cases per 100,000 population. The other regions had rates between 12.2 and 37.7 per 100,000.

## **Legionellosis**

**Agent:** *Legionella* species (bacteria); most infections in United States are caused by *Legionella pneumophila*.

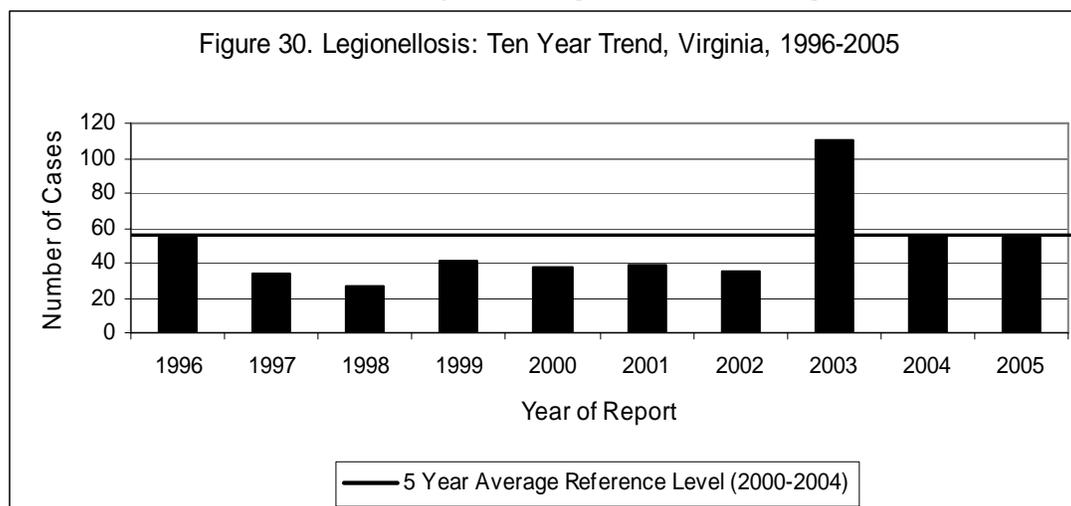
**Mode of Transmission:** Inhalation of contaminated aerosols (e.g., water sprays, mists).

**Signs/Symptoms:** Infection with *L. pneumophila* causes two distinct illnesses: Legionnaires' disease, characterized by fever, muscle aches, headaches, malaise, cough, and pneumonia; and Pontiac fever, a mild influenza-like illness without pneumonia. Pontiac Fever and Legionnaires' disease are referred to as "Legionellosis", separately or together.

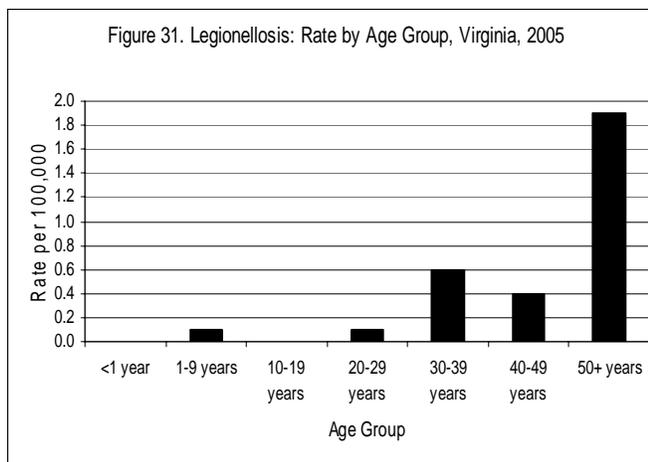
**Prevention:** For outbreaks, disinfection of contaminated water sources by chlorination or superheating of water to 160°F- 170°F, and appropriate mechanical cleaning.

**Other Important Information:** Legionellosis is more common among people who smoke or have chronic medical conditions.

During 2005, 55 cases of legionellosis were reported in Virginia. This is similar to the number reported in 2004 (56 cases) and the five year average (55.4 cases) (Figure 30).



The highest incidence rates are among adults age 50 and over (1.9 per 100,000) (Figure 31). The black population had a higher incidence rate than the white population (1.3 and 0.6 per 100,000, respectively). Males had a slightly higher incidence rate than females (0.8 and 0.6 per 100,000). The southwest and eastern regions had the highest incidence rates (1.0 per 100,000), followed by the northwest region (0.8 per 100,000). The central and northern regions had rates of 0.6 and 0.5 per 100,000, respectively. In 2005, the first quarter of year had the lowest number of cases (15%), but this disease is not known to have a seasonal pattern. In May, two outbreaks were reported, one from a U.S. postal office and one from a hot tub (see Table 11 on page 59). Four deaths due to legionellosis were reported during 2005.



## **Leprosy (Hansen's Disease)**

Agent: *Mycobacterium leprae* (bacteria)

Mode of Transmission: Person to person, probably through nasal secretions from persons with untreated lepromatous disease (those with discolored spots on the skin).

Signs/Symptoms: A chronic disease with varying symptoms, including skin lesions (tuberculoid leprosy); discolored, flat spots on the skin (lepromatous leprosy); nasal congestion; nosebleeds; and nerve damage.

Prevention: Early diagnosis and treatment is important. Hand washing when in contact with patients with lepromatous leprosy and disinfection of surfaces contaminated with infectious nasal secretions should be performed until treatment is established.

No cases of leprosy were reported in Virginia during 2005. The last reported case occurred in 2001.

## **Listeriosis**

Agent: *Listeria monocytogenes* (bacteria)

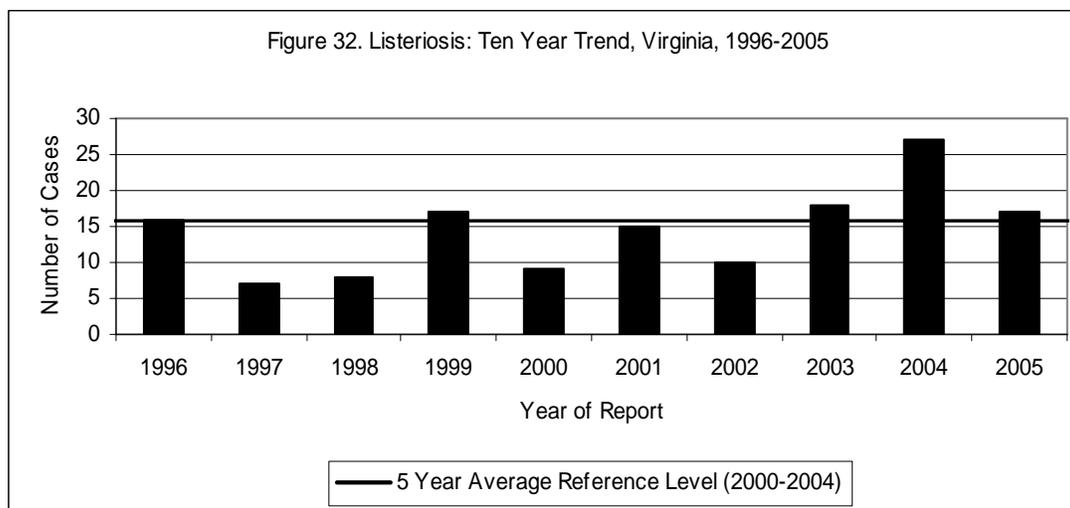
Mode of Transmission: Ingestion of contaminated foods or beverages.

Signs/Symptoms: Typically, fever, headache, nausea, and vomiting. Infection can lead to serious disease, including shock and inflammation of the brain and the fluid surrounding the brain and spinal cord. Miscarriage may occur.

Prevention: Safe food preparation (e.g., thoroughly cooking raw food from animals and wash vegetables) and avoidance of high risk foods (e.g., unpasteurized dairy products).

Other Important Information: Persons at higher risk include pregnant women and persons with weakened immune systems.

The 17 cases of listeriosis reported in Virginia during 2005 were a 37% decrease from the 27 cases reported in 2004, but an 8% increase from the five year average of 15.8 cases per year (Figure 32).



Four cases occurred in the less than 1 year population (4.0 per 100,000). The other age groups had incidence rates between 0 and 0.5 per 100,000. The black and white populations had similar incidence rates (0.1 and 0.2 per 100,000, respectively). The incidence rate in females and males was the same (0.2 per 100,000). By region, the highest rate was reported from the northwest region (0.4 per 100,000). The other regions reported rates between 0.2 and 0.3 per 100,000. Cases occurred throughout the year, with the largest proportion (41.2%) occurring during the third quarter. Three deaths due to listeriosis were reported during 2005.

## **Lyme Disease**

**Agent:** *Borrelia burgdorferi* (spirochete bacteria)

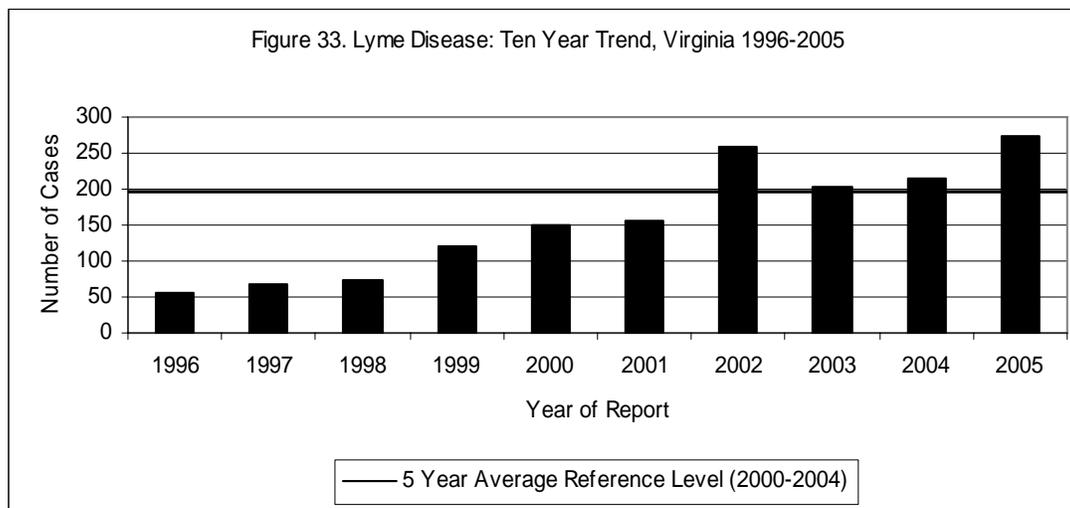
**Mode of Transmission:** Transmitted to humans from the bite of infected nymphal or adult deer ticks. Infected ticks must bite a human and remain attached (feeding) for a minimum of 24 hours to be able to transmit the Lyme disease pathogen.

**Signs/Symptoms:** Initial symptoms include fever, headache, fatigue, and a characteristic skin rash called erythema migrans. If untreated, infection can spread to joints, the heart, and the nervous system.

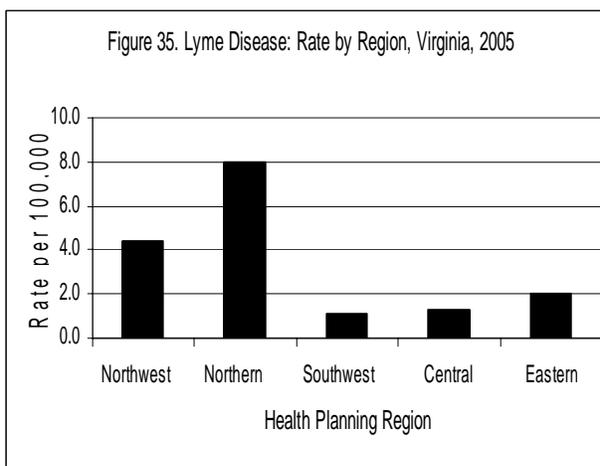
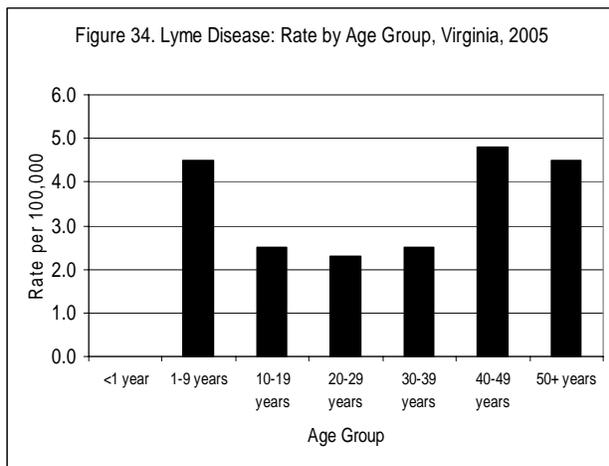
**Prevention:** Avoid being bitten by ticks. Avoid tick prone habitats such as humid forest environments with dense undergrowth and/or heavy leaf litter; tall weeds along forest margins, tree lines, forest trails and forest clearings. When in tick prone habitats, wear light colored clothing with pants legs tucked into socks. Apply permethrin based repellents to clothing (shoes, pants, and socks). Apply DEET, Picaridin, or Oil of Lemon Eucalyptus based repellents to exposed areas of skin (legs and arms). Thoroughly check your body for ticks after visiting tick prone habitats and remove attached ticks as soon as possible.

**Other Important Information:** Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of prolonged exposure to an infected deer tick.

During 2005, 274 cases of Lyme disease were reported in Virginia. This is a 27% increase from the 216 cases reported in 2004, and a 40% increase from the five year average of 196.4 cases per year (Figure 33). There has been an increasing trend of reported cases of Lyme disease in Virginia since 1995.



The highest incidence rate was reported in the 40-49 year old age group (4.8 per 100,000), followed closely by the 1-9 and 50 year and older age groups (4.5 per 100,000, each) (Figure 34). Race data was missing for 32% of reports, but those reports with information on race suggest that the rate among the white population (3.2 per 100,000) was more than ten times the rate among the black population (0.3 per 100,000). The other race category had a rate of 0.1 per 100,000. Males had a slightly higher rate than females (3.8 versus 3.5 per 100,000, respectively). The northern region reported the highest incidence rate (8.0 per 100,000), followed by the northwest region (4.4 per 100,000) (Figure 35). Loudoun and Prince William Counties, located in the northern region, reported the highest number of cases (106 and 26, respectively).



Fauquier County, a county that borders Prince William, reported over half of the cases (25/49) in the northwest region. The high numbers in these counties may be because the number of deer ticks is higher in the northern region than other areas of the state. The other regions reported rates between 1.1 and 2.0 per 100,000. Most cases (68%) occurred from April to September.

### **Lymphogranuloma Venereum**

Agent: Specific immunotypes of the bacteria, *Chlamydia trachomatis*

Mode of Transmission: Sexually transmitted through contact with the lesions of an infected person.

Signs/Symptoms: Small, painless lesions on the penis or vulva, which usually go unnoticed. Fever, chills, headache, anorexia, and joint pain may also be present.

Prevention: Safe sexual practices.

Other Important Information: This disease rarely occurs in most developing countries, but as of September 2004, the Netherlands reported as many as 92 cases among men who have sex with men.

Two cases, one in a black male and another in a white male, were reported in 2005. One case of lymphogranuloma venereum was reported in a Hispanic male in 2004. Prior to 2004, the last reported case of this disease in Virginia occurred in 2000.

### **Malaria**

Agent(s): Four different species of protozoan parasites: *Plasmodium falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*.

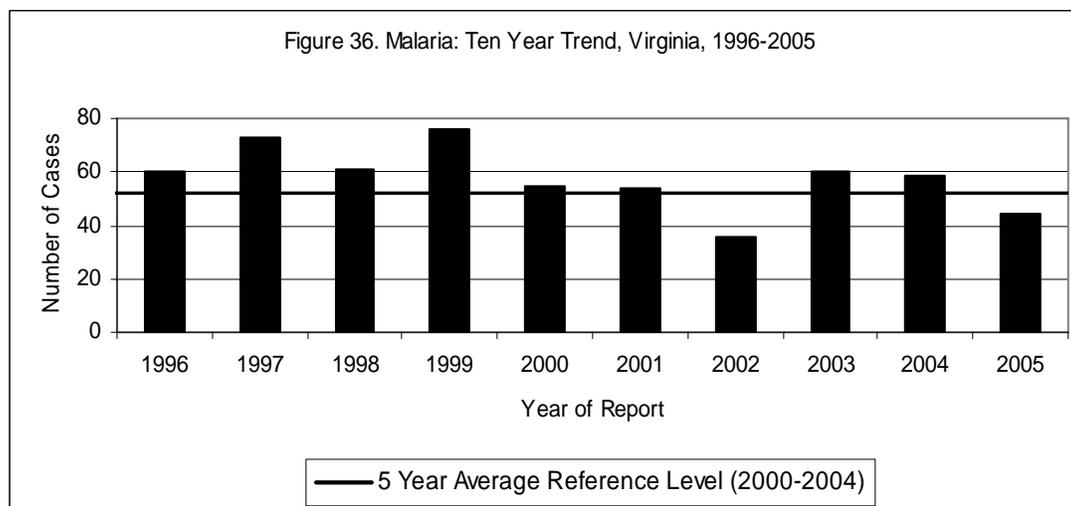
Mode of Transmission: In Virginia, malaria could be transmitted to humans by infected Anopheline mosquitoes of the species *Anopheles quadrimaculatus* or by *An. punctipennis*. Malaria may also be transmitted by blood transfusion or transplanted organs from infected donors.

Signs/Symptoms: Typically, high fevers, shaking, chills, sweats, severe headache, muscle and joint pain, anorexia, nausea, flu-like illness, anemia and an enlarged spleen. *P. falciparum* infections may progress to severe malaria if not treated promptly; symptoms include acute alteration of brain structure and function, severe anemia, jaundice, renal failure and coma.

Prevention: Take an appropriate medication for malaria prophylaxis when traveling in malaria endemic countries. Anopheline mosquitoes bite only at dusk, dawn or during night time hours and tend to enter buildings. Avoid mosquito bites at these times by staying in structures with adequate screening and/or equipped with bed nets, and when outdoors, by wearing long sleeved, loose fitting, light colored clothing and mosquito repellents.

Other Important Information: Humans and certain *Anopheles* mosquito species are the only natural reservoirs for malaria. Although no form of malaria is currently endemic to Virginia, it may be brought to this region by travelers or immigrants with dormant or inapparent infections. Various forms of malaria might also arrive in Virginia carried by infected mosquitoes transported in aircraft arriving from foreign destinations. Almost all infections reported in Virginia occur in individuals who were infected in other countries.

In 2005, 44 cases of malaria were reported in Virginia. This is a 25% decrease from the 59 cases reported in 2004, and a 17% decrease from the five year average of 52.8 cases per year (Figure 36).



The 40-49 year age group had the highest incidence rate (1.3 per 100,000), followed by the less than one year age group (1 per 100,000). The black population had a higher incidence rate than the white population (1.8 and 0.1 per 100,000, respectively). Females had a similar rate to males (0.5 versus 0.7 per 100,000, respectively). The northern and southwest regions reported the same rate (0.9 per 100,000). The other regions reported rates between 0.2 and 0.6 per 100,000. Cases occurred less often in the second quarter of the year than in the other quarters (7%). One death due to malaria was reported in 2005.

All cases reported a history of travel outside of the United States within the four years prior to disease onset. Information on malaria prophylaxis usage was obtained for 36 cases (82%). Of these, 17 (47%) reported receiving prophylaxis for malaria, although 5 of these cases reported missing at least one dose.

## **Measles**

Agent: Measles virus

Mode of Transmission: Person to person by inhalation of respiratory droplets or direct contact with nasal or throat secretions of infected people.

Signs/Symptoms: Fever, conjunctivitis, nose secretions, cough, and a typical rash on the third to seventh day after onset of symptoms.

Prevention: Measles vaccine should be given as part of the measles, mumps, and rubella (MMR) series beginning at 12-15 months of age followed by a second dose at age 4-6 years.

Other Important Information: Measles is highly communicable, with >90% secondary attack rates among susceptible people.

No cases of measles were reported in Virginia during 2005. Virginia's last reported case occurred in 2001.

## **Meningococcal Infection**

Agent: *Neisseria meningitidis* (bacteria)

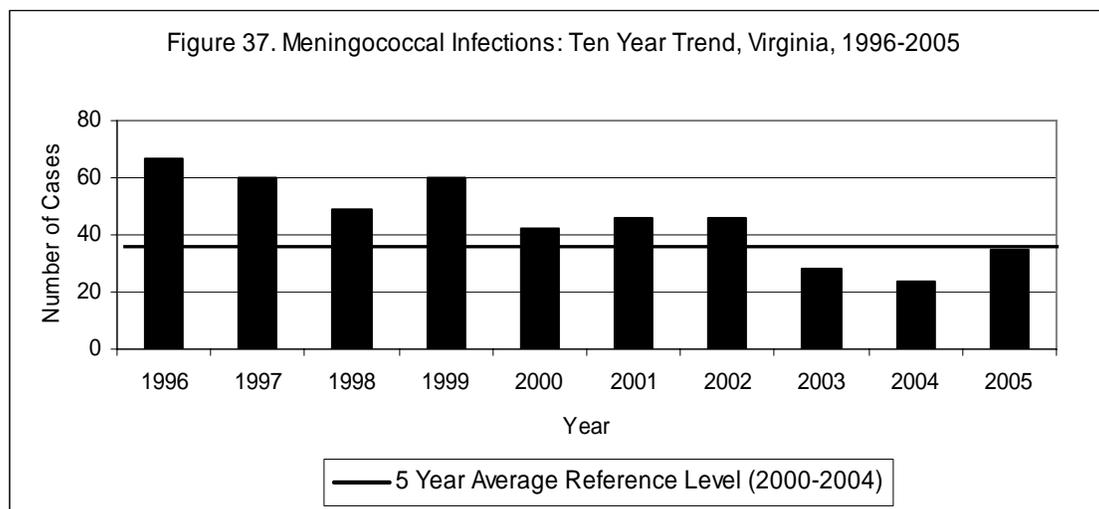
Mode of Transmission: Transmission occurs through contact with respiratory droplets from the nose or throat of infected people (e.g., through coughing or kissing).

Signs/Symptoms: Sudden onset of fever, headache, stiff neck, vomiting, and photophobia (fear of light). A rash may also be present.

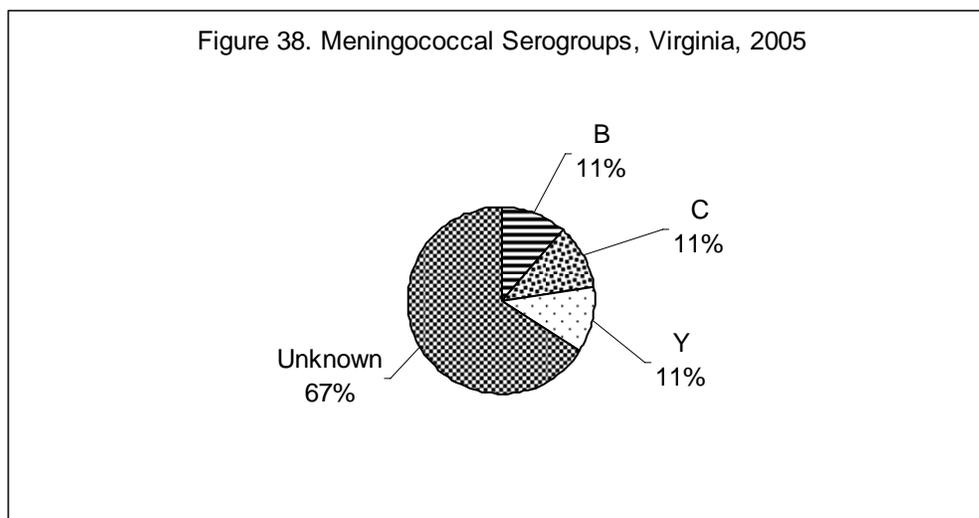
Prevention: Vaccination protects against two of the three types of infection that are common in the United States.

Other Important Information: Crowding, exposure to tobacco smoke, and coexisting respiratory tract infections increase the risk of disease. Five percent to 10% of people carry *N. meningitidis* in their nose without having any symptoms of disease; those who develop disease are usually infected by a carrier who does not have symptoms.

During 2005, 35 cases of meningococcal infection were reported in Virginia. This is a 46% increase from the 24 cases reported in 2004, but a 6% decrease from the five year average of 37.2 cases per year (Figure 37).



The highest rate of infection occurred in the infant population (1.0 per 100,000), followed by the 10-19 and 20-29 year age groups (0.7 per 100,000, each). The black and white populations had similar incidence rates (0.5 and 0.4 per 100,000, respectively). Similar rates were reported for females and males (0.4 and 0.5 per 100,000, respectively). Among the 33% of cases for which a serogroup was identified, 4 were group Y, 4 were group B, and 4 were group C (Figure 38).



The eastern region reported the highest rate, 0.8 cases per 100,000 population, and the central region reported the lowest rate, 0.2 cases per 100,000 population. Onset occurred less often in the third quarter of the year (17% of cases) than in the other quarters. Three deaths due to meningococcal infection were reported during 2005.

## **Monkeypox**

Agent: Monkeypox virus (genus *Orthopoxvirus*)

Mode of Transmission: From the bite of or direct contact with lesions or body fluids of an infected animal. Though less common, infection can be transmitted from person to person by respiratory droplets or by direct contact with body fluids of an infected person, or with virus-contaminated objects such as bedding.

Signs/Symptoms: Similar to smallpox, though more mild. Initial symptoms include fever, headache, backache, sore throat, cough and swollen lymph nodes. Three days after fever onset, a rash develops.

Prevention: Avoid contact with exotic or wild mammals that originate from areas where monkeypox has occurred.

Other Important Information: In 2003, a monkeypox outbreak was reported in the United States among persons exposed to native prairie dogs that had contact with imported African rodents.

Monkeypox became a reportable disease in Virginia in 2004. No cases of monkeypox have ever been reported in Virginia.

## **Mumps**

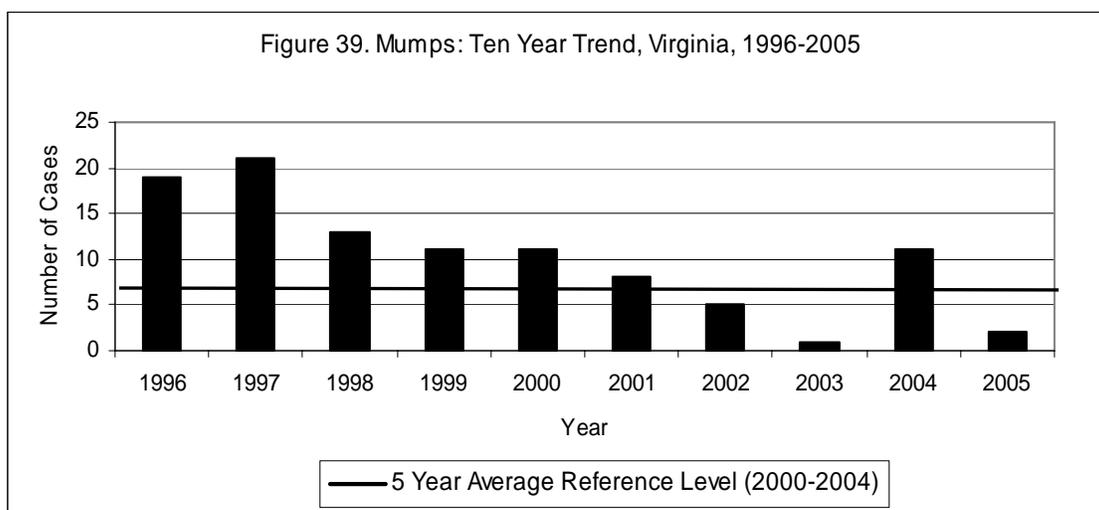
Agent: Mumps (virus)

Mode of Transmission: Person to person through respiratory droplets, as well as through direct contact with saliva of an infected person.

**Signs/Symptoms:** Fever, swelling and tenderness of one or more salivary glands. In children under five, 40%-50% of cases are associated with respiratory symptoms.

**Prevention:** Vaccination, preferably administered as MMR, beginning at age 12 months. Two doses of mumps-containing vaccine are recommended for school aged children, health care workers, international travelers, and college students.

Two cases of mumps were reported in Virginia during 2005, a decrease from the 11 cases reported in 2004 and a 72% decrease from the five year average of 7.2 cases per year (Figure 39).



One case was in the age 20-29 year group and the other in the 50 year and older age group. Both cases were male; one was white and the other was in the other race category. One was reported from the northern region; the other was from the central region.

## **Ophthalmia Neonatorum**

**Agent:** *Chlamydia trachomatis* or *Neisseria gonorrhoea* (bacteria), though *C. trachomatis* is most common.

**Mode of Transmission:** Infants are exposed to the organism in the birth canal during childbirth.

**Signs/Symptoms:** Redness or swelling of one or both eyes beginning five to fourteen days after birth.

**Prevention:** Screen all pregnant women for chlamydia and gonorrhea infection and follow with appropriate treatment for infected women and their partner(s).

Eighteen infants were reported with ophthalmia neonatorum caused by *C. trachomatis*. Nine of the cases were in the black population, two were in the white population, and seven were of unknown race. Most (12) of the cases were male. The eastern region reported 11 cases, the central region reported four, the northwest region two, and the northern region one. No cases were reported from the southwest region.

### **Outbreak, Foodborne**

Thirteen foodborne outbreaks were reported in Virginia during 2005 (see Table 8 on the following page). The number of ill persons per outbreak ranged from three Virginia residents who were part of a multi-state outbreak to 59 ill in an outbreak of *Staphylococcus aureus* at a middle school. The etiologic agent was confirmed to be viral for 5 outbreaks (all norovirus) and bacterial for seven. Of the bacterial outbreaks, four were attributed to *Salmonella* (ser. Enteritidis, Hartford, and Typhimurium), and three were due to *Staphylococcus aureus*. One outbreak had an unknown etiologic agent. Factors contributing to the outbreaks included improper food handling (i.e., not keeping the food at the correct temperature or not cooking it for the correct amount of time) and infected food handlers.

### **Outbreak, Nosocomial**

A nosocomial outbreak is defined as a group of illnesses with a common etiology among patients in a medical care facility (hospital or nursing home), where those patients acquired the illness while confined to that facility. There were 90 nosocomial outbreaks reported in Virginia during 2005, compared to 46 in 2004 (see Table 9 on the following page). Outbreaks included one thought to be scabies, one unknown gastrointestinal illness, and 29 confirmed or suspected influenza outbreaks. All other outbreaks were confirmed or suspected to be norovirus. For norovirus or respiratory outbreaks in nursing homes, control measures include, but are not limited to, the following: hand washing education, cohorting of ill patients, keeping ill staff at home until three days after their symptoms subside, and cleaning contaminated surfaces with disinfectant.

### **Outbreak, Other**

One hundred thirty-six other outbreaks were reported in Virginia during 2005 (see Table 10 on page 55). The etiologic agent in most outbreaks (110, 81%) was confirmed or suspected to be a virus, including norovirus, chickenpox, hepatitis A and B, influenza, and enterovirus. Five methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks were reported from a correctional facility, military school, regional jail, drug rehabilitation center, and fire station. There was one outbreak of *Salmonella* infection in a daycare with an unknown mode of transmission and several outbreaks of *Bordetella pertussis* (involving several schools, a community and a daycare)

### **Outbreak, Waterborne**

Two *Legionella pneumophila* outbreaks were reported during 2005 involving a U.S. Post Office and a hot tub. The primary reservoir of this organism is water and these outbreaks were classified as waterborne because transmission most likely occurred through inhalation of water mists or sprays (See Table 11 on page 59).

**Table 8. Foodborne Outbreaks Reported in Virginia, 2005**

| Onset Date | Health District    | Number of Cases | Etiologic Agent               | Vehicle                 | Place Where Outbreak Occurred |
|------------|--------------------|-----------------|-------------------------------|-------------------------|-------------------------------|
| February   | Roanoke City       | 5               | Gastrointestinal Illness      | Sandwiches Suspected    | Restaurant                    |
| 3/1/2005   | Cumberland Plateau | 30              | Norovirus                     | Unknown                 | Private Club                  |
| 3/21/2005  | Crater             | 27              | <i>Salmonella enteritidis</i> | Eggs Suspected          | Correctional Facility         |
| 4/1/2005   | Piedmont           | 6               | Norovirus                     | Salad Suspected         | Restaurant                    |
| 4/5/2005   | Lenowisco          | 28              | Norovirus                     | Unknown                 | Restaurant                    |
| 4/21/2005  | Crater             | 9               | Norovirus                     | Chicken Salad Suspected | Restaurant                    |
| 4/28/2005  | Thomas Jefferson   | 20              | Norovirus                     | Unknown                 | Restaurant                    |
| June       | Multi-state        | 3 in VA         | <i>Salmonella typhimurium</i> | Ice Cream               | Ice Cream Restaurant          |
| July       | Fairfax            | 7-9             | <i>Salmonella hartford</i>    | Salad Suspected         | Restaurant                    |
| 7/17/2005  | Fairfax            | 36              | <i>Salmonella typhimurium</i> | Chicken Dish Suspected  | Catered Event                 |
| 9/2/2005   | Prince William     | 59              | <i>Staphylococcus aureus</i>  | Pasta Salad/BBQ Chicken | Middle School                 |
| 11/17/2005 | Fairfax            | 6               | <i>Staphylococcus aureus</i>  | Chicken Salad           | Workplace                     |
| 12/13/2005 | Henrico            | 21              | <i>Staphylococcus aureus</i>  | Roast Pork Suspected    | Catered Event                 |

**Table 9. Nosocomial Outbreaks Reported in Virginia, 2005**

| Onset Date | Health District    | Number of Cases | Etiologic Agent     | Vehicle          | Place Where Outbreak Occurred |
|------------|--------------------|-----------------|---------------------|------------------|-------------------------------|
| Unknown    | Fairfax            | 13              | Norovirus           | Unknown          | Nursing Home                  |
| Unknown    | Richmond City      | Unk             | Norovirus Suspected | Person to person | Nursing Home                  |
| 12/28/2004 | Lord Fairfax       | 17              | Norovirus           | Person to person | Nursing Home                  |
| January    | Three Rivers       | 18              | Norovirus           | Unknown          | Convalescent Center           |
| January    | Fairfax            | 30              | Norovirus           | Person to person | Nursing Home                  |
| 1/2/2005   | Fairfax            | 24              | Norovirus           | Person to person | Long Term Care Facility       |
| 1/3/2005   | Peninsula          | 17              | Influenza Suspected | Person to person | Nursing Home                  |
| 1/4/2005   | Henrico            | 43              | Norovirus           | Person to person | Nursing Home                  |
| 1/4/2005   | Lord Fairfax       | 10              | Norovirus Suspected | Person to person | Nursing Home                  |
| 1/4/2005   | Western Tidewater  | 8               | Influenza A         | Person to person | Nursing Home                  |
| 1/7/2005   | Fairfax            | Unk             | Norovirus           | Person to person | Long Term Care Facility       |
| 1/8/2005   | Norfolk            | 32              | Norovirus           | Person to person | Nursing Home                  |
| 1/10/2005  | Central Shenandoah | 12              | Norovirus Suspected | Person to person | Nursing Home                  |
| 1/10/2005  | Thomas Jefferson   | 8               | Norovirus Suspected | Person to person | Nursing Home                  |

**Table 9. Nosocomial Outbreaks Reported in Virginia, 2005 (continued)**

| <b>Onset Date</b> | <b>Health District</b> | <b>Number of Cases</b> | <b>Etiologic Agent</b> | <b>Vehicle</b>   | <b>Place Where Outbreak Occurred</b> |
|-------------------|------------------------|------------------------|------------------------|------------------|--------------------------------------|
| 1/11/2005         | Henrico                | 8                      | Norovirus              | Person to person | Nursing Home                         |
| 1/11/2005         | Three Rivers           | 46                     | Norovirus              | Person to person | Nursing Home                         |
| 1/13/2005         | Lord Fairfax           | 16                     | Norovirus Suspected    | Person to person | Nursing Home                         |
| 1/14/2005         | Thomas Jefferson       | 38                     | Norovirus              | Person to person | Nursing Home                         |
| 1/15/2005         | Peninsula              | 49                     | Norovirus Suspected    | Person to person | Nursing Home                         |
| 1/17/2005         | Central Virginia       | 78                     | Norovirus              | Person to person | Nursing Home                         |
| 1/19/2005         | Three Rivers           | 20                     | Influenza Suspected    | Person to person | Nursing Home/Assisted Living         |
| 1/20/2005         | Central Shenandoah     | 6                      | Norovirus              | Person to person | Hospital                             |
| 1/20/2005         | Lord Fairfax           | 17                     | Influenza A            | Person to person | Nursing Home                         |
| 1/21/2005         | Thomas Jefferson       | 10                     | Norovirus              | Person to person | Nursing Home                         |
| 1/22/2005         | Henrico                | 5                      | Norovirus              | Person to person | Long Term Care Facility              |
| 1/23/2005         | Henrico                | 38                     | Influenza A            | Person to person | Nursing Home                         |
| 1/25/2005         | Lord Fairfax           | 30                     | Norovirus              | Person to person | Nursing Home                         |
| 1/30/2005         | Three Rivers           | 57                     | Norovirus              | Person to person | Nursing Home                         |
| 1/31/2005         | Hanover                | 53                     | Norovirus              | Person to person | Nursing Home                         |
| 1/31/2005         | Peninsula              | 20                     | Influenza              | Person to person | Nursing Home                         |
| 1/31/2005         | Peninsula              | 64                     | Influenza A            | Person to person | Nursing Home                         |
| 2/1/2005          | Virginia Beach         | Unk                    | Norovirus              | Person to person | Nursing Home                         |
| 2/1/2005          | Peninsula              | 7                      | Norovirus Suspected    | Person to person | Nursing Home                         |
| 2/1/2005          | Rappahannock           | 15                     | Norovirus              | Person to person | Nursing Home/Assisted Living         |
| 2/2/2005          | Central Virginia       | 57                     | Norovirus              | Person to person | Nursing Home                         |
| 2/3/2005          | Cumberland Plateau     | 11                     | Norovirus              | Person to person | Nursing Home                         |
| 2/3/2005          | Henrico                | 22                     | Influenza Suspected    | Person to person | Nursing Home                         |
| 2/3/2005          | Crater                 | 15                     | Influenza Suspected    | Person to person | Nursing Home                         |
| 2/4/2005          | Roanoke City           | 25                     | Norovirus Suspected    | Person to person | Nursing Home                         |
| 2/4/2005          | Chesapeake             | 21                     | Norovirus              | Person to person | Nursing Home                         |
| 2/7/2005          | Peninsula              | 82                     | Norovirus Suspected    | Person to person | Nursing Home                         |
| 2/7/2005          | Thomas Jefferson       | 63                     | Norovirus Suspected    | Person to person | Nursing Home/Assisted Living         |
| 2/8/2005          | Western Tidewater      | 52                     | Norovirus Suspected    | Person to person | Nursing Home                         |
| 2/8/2005          | Lord Fairfax           | 22                     | Influenza A            | Person to person | Nursing Home                         |
| 2/9/2005          | Western Tidewater      | 22                     | Norovirus              | Person to person | Nursing Home                         |
| 2/9/2005          | Richmond City          | Unk                    | Influenza A            | Person to person | Nursing Home                         |
| 2/10/2005         | Cumberland Plateau     | 43                     | Norovirus              | Person to person | Nursing Home                         |
| 2/10/2005         | Henrico                | 4                      | Norovirus Suspected    | Person to person | Nursing Home/Assisted Living         |
| 2/10/2005         | Western Tidewater      | 17                     | Norovirus              | Person to person | Nursing Home/Assisted Living         |
| 2/10/2005         | Henrico                | 20                     | Influenza A            | Person to person | Nursing Home                         |
| 2/10/2005         | New River              | 31                     | Influenza Suspected    | Person to person | Nursing Home                         |
| 2/11/2005         | Virginia Beach         | 37                     | Norovirus Suspected    | Person to person | Nursing Home                         |

**Table 9. Nosocomial Outbreaks Reported in Virginia, 2005 (continued)**

| <b>Onset Date</b> | <b>Health District</b> | <b>Number of Cases</b> | <b>Etiologic Agent</b>   | <b>Vehicle</b>   | <b>Place Where Outbreak Occurred</b> |
|-------------------|------------------------|------------------------|--------------------------|------------------|--------------------------------------|
| 2/11/2005         | Lord Fairfax           | 39                     | Influenza A              | Person to person | Nursing Home                         |
| 2/13/2005         | Henrico                | 8                      | Influenza A              | Person to person | Nursing Home                         |
| 2/14/2005         | Piedmont               | 26                     | Norovirus                | Person to person | Nursing Home                         |
| 2/14/2005         | Hampton                | 35                     | Influenza Suspected      | Person to person | Nursing Home                         |
| 2/15/2005         | Thomas Jefferson       | 23                     | Norovirus Suspected      | Person to person | Nursing Home                         |
| 2/16/2005         | Hampton                | 16                     | Influenza Suspected      | Person to person | Nursing Home                         |
| 2/18/2005         | Henrico                | 10                     | Influenza Suspected      | Person to person | Nursing Home                         |
| 2/21/2005         | Alexandria             | 8                      | Influenza A              | Person to person | Nursing Home                         |
| 2/22/2005         | Chesapeake             | Unk                    | Norovirus Suspected      | Person to person | Nursing Home                         |
| 2/22/2005         | Peninsula              | 153                    | Norovirus                | Person to person | Nursing Home                         |
| 2/23/2005         | Virginia Beach         | 15                     | Influenza Suspected      | Person to person | Nursing Home/Assisted Living         |
| 2/24/2005         | Piedmont               | Unk                    | Norovirus Suspected      | Person to person | Nursing Home                         |
| 2/24/2005         | Arlington              | 54                     | Norovirus                | Person to person | Nursing Home                         |
| 2/25/2005         | Richmond City          | 20                     | Norovirus                | Person to person | Nursing Home                         |
| 2/25/2005         | Eastern Shore          | 9                      | Norovirus                | Person to person | Nursing Home                         |
| 2/26/2005         | West Piedmont          | 14                     | Influenza                | Person to person | Skilled/Assisted Care                |
| 2/26/2005         | Piedmont               | Unk                    | Influenza A              | Person to person | Nursing Home                         |
| 2/27/2005         | Thomas Jefferson       | 11                     | Influenza Suspected      | Person to person | Nursing Home                         |
| 2/27/2005         | Henrico                | Unk                    | Influenza Suspected      | Person to person | Nursing Home                         |
| 3/1/2005          | Henrico                | 27                     | Influenza Suspected      | Person to person | Nursing Home                         |
| 3/1/2005          | Three Rivers           | Unk                    | Influenza A              | Person to person | Nursing Home                         |
| 3/2/2005          | Eastern Shore          | 9                      | Influenza A              | Person to person | Nursing Home                         |
| 3/2/2005          | Three Rivers           | Unk                    | Influenza Suspected      | Person to person | Nursing Home                         |
| 3/2/2005          | Cumberland Plateau     | Unk                    | Influenza A              | Person to person | Nursing Home                         |
| 3/3/2005          | Arlington              | Unk                    | Norovirus                | Person to person | Nursing Home                         |
| 3/8/2005          | Eastern Shore          | 17                     | Norovirus                | Person to person | Nursing Home                         |
| 3/8/2005          | Thomas Jefferson       | Unk                    | Norovirus                | Person to person | Hospital                             |
| 3/14/2005         | Central Virginia       | 58                     | Norovirus                | Person to person | Nursing Home                         |
| 3/17/2005         | Virginia Beach         | Unk                    | Norovirus                | Person to person | Nursing Home                         |
| 3/23/2005         | Richmond City          | 25                     | Norovirus                | Person to person | Nursing Home                         |
| 3/26/2005         | Central Virginia       | 36                     | Norovirus                | Person to person | Nursing Home                         |
| 3/26/2005         | West Piedmont          | 14                     | Influenza A              | Person to person | Assisted Living and Skilled Care     |
| 4/28/2005         | Fairfax                | Unk                    | Norovirus                | Person to person | Nursing Home                         |
| September         | Arlington              | 18                     | Rash/Suspected Scabies   | Person to person | Hospital                             |
| 12/2/2005         | Three Rivers           | 9                      | Norovirus Suspected      | Person to person | Nursing Home                         |
| 12/14/2005        | Fairfax                | 21                     | Norovirus                | Person to person | Nursing Home                         |
| 12/15/2005        | Peninsula              | 34                     | Norovirus                | Person to person | Hospital                             |
| 12/16/2005        | Prince William         | 9                      | Gastrointestinal Illness | Person to person | Hospital Psychiatric Ward            |
| 12/25/2005        | Henrico                | 35                     | Norovirus                | Person to person | Nursing Home                         |
| 12/28/2005        | Henrico                | 17                     | Influenza A              | Person to person | Nursing Home/Special Care            |

**Table 10. Other Outbreaks Reported in Virginia, 2005**

| Onset Date | Health District      | Number of Cases | Etiologic Agent  | Vehicle          | Place Where Outbreak Occurred |
|------------|----------------------|-----------------|--|------------------|-------------------------------|
| Unknown    | Rappahannock         | 2               | <i>Salmonella</i>  | Unknown          | Daycare                       |
| Unknown    | Fairfax              | 4               | Norovirus Suspected  | Unknown          | Restaurant                    |
| Unknown    | Chesterfield         | Unk             | Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) Suspected          | Unknown          | Correctional Facility         |
| Unknown    | Central Shenandoah   | 1-20            | Community-acquired Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) | Unknown          | Military School               |
| Unknown    | Mount Rogers         | Unk             | Gastrointestinal Illness   | Unknown          | Elementary School             |
| 12/27/2004 | Fairfax              | 4               | Norovirus  | Unknown          | Possibly a Restaurant         |
| 12/28/2004 | Lord Fairfax         | 8               | Norovirus Suspected  | Person to person | Assisted Living               |
| January    | Fairfax              | 4               | Norovirus  | Unknown          | Restaurant Suspected          |
| January    | Henrico              | 9               | Influenza  | Person to person | School                        |
| January    | Lord Fairfax         | Unk             | Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)                    | Unknown          | Jail                          |
| 1/1/2005   | Peninsula            | 12              | Influenza  | Person to person | Assisted Living               |
| 1/3/2005   | Alexandria           | 14              | Norovirus Suspected  | Unknown          | School                        |
| 1/3/2005   | Portsmouth           | Unk             | Norovirus  | Person to person | Assisted Living               |
| 1/3/2005   | Virginia Beach       | 5               | Varicella (Chickenpox)   | Person to person | Middle School                 |
| 1/4/2005   | Fairfax              | 2               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 1/6/2005   | Central Shenandoah   | 21              | Varicella (Chickenpox)   | Person to person | Multiple Schools              |
| 1/8/2005   | Rappahannock-Rapidan | 16              | Norovirus  | Person to person | Rehabilitation Facility       |
| 1/8/2005   | Central Shenandoah   | 6               | Gastrointestinal Illness   | Unknown          | Restaurant                    |
| 1/15/2005  | Peninsula            | 49              | Norovirus Suspected  | Person to person | Assisted Living               |
| 1/18/2005  | Three Rivers         | 13              | <i>Bordetella pertussis</i>  | Person to person | Multiple Schools              |
| 1/20/2005  | Central Virginia     | 6               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 1/21/2005  | Crater               | 16              | Influenza A  | Person to person | Assisted Living               |
| 1/22/2005  | Thomas Jefferson     | 15              | Norovirus  | Person to person | Assisted Living               |
| 1/25/2005  | Fairfax              | 4               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 1/25/2005  | Western Tidewater    | 42              | Norovirus  | Person to person | Assisted Living               |
| 1/26/2005  | Fairfax              | 27              | Norovirus  | Person to person | Daycare                       |
| 1/31/2005  | Chesapeake           | 10              | Influenza A  | Person to person | Training Center               |
| 1/31/2005  | Peninsula            | 3               | Norovirus Suspected  | Person to person | Independent Living            |

**Table 10. Other Outbreaks Reported in Virginia (continued)**

| <b>Onset Date</b> | <b>Health District</b> | <b>Number of Cases</b> | <b>Etiologic Agent</b>      | <b>Vehicle</b>   | <b>Place Where Outbreak Occurred</b> |
|-------------------|------------------------|------------------------|-----------------------------|------------------|--------------------------------------|
| 2/2/2005          | Fairfax                | 6                      | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 2/3/2005          | Central Virginia       | 5                      | Influenza A                 | Person to person | Training Center                      |
| 2/3/2005          | Lord Fairfax           | 24                     | <i>Bordetella pertussis</i> | Person to person | Community                            |
| 2/4/2005          | Western Tidewater      | 63                     | Norovirus                   | Person to person | Rehabilitation Center                |
| 2/5/2005          | Chesterfield           | 44                     | Norovirus                   | Person to person | Assisted Living                      |
| 2/6/2005          | Virginia Beach         | 58                     | Norovirus                   | Person to person | Assisted Living                      |
| 2/6/2005          | Central Shenandoah     | 409                    | Varicella (Chickenpox)      | Person to person | Multiple Schools                     |
| 2/8/2005          | Hanover                | 43                     | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 2/14/2005         | Rappahannock-Rapidan   | 2                      | Influenza                   | Person to person | Residential Facility                 |
| 2/14/2005         | Central Virginia       | 37                     | Influenza A                 | Person to person | Treatment Center                     |
| 2/15/2005         | Lenowisco              | 209                    | Norovirus                   | Person to person | Combined School                      |
| 2/16/2005         | Fairfax                | 18                     | Norovirus                   | Person to person | Assisted Living                      |
| 2/17/2005         | Fairfax                | 9                      | Norovirus Suspected         | Person to person | Mental Health Institute              |
| 2/18/2005         | Lord Fairfax           | 14                     | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 2/19/2005         | Virginia Beach         | 15                     | Norovirus                   | Person to person | Rehabilitation Center                |
| 2/22/2005         | Three Rivers           | 11                     | Influenza A                 | Person to person | Rehabilitation Center                |
| 2/23/2005         | Hanover                | 23                     | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 2/25/2005         | Henrico                | 7                      | Norovirus Suspected         | Person to person | Assisted Living                      |
| 2/25/2005         | Henrico                | 13                     | Influenza A                 | Person to person | Assisted Living                      |
| 3/1/2005          | Henrico                | Unk                    | Norovirus                   | Person to person | Assisted Living                      |
| 3/1/2005          | Henrico                | 14                     | Influenza A                 | Person to person | Assisted Living                      |
| 3/1/2005          | Thomas Jefferson       | 27                     | Influenza A                 | Person to person | Correctional Facility                |
| 3/13/2005         | Chesterfield           | 17                     | Norovirus                   | Person to person | Adult Care Facility                  |
| 3/14/2005         | Rappahannock           | 5                      | <i>Bordetella pertussis</i> | Person to person | Elementary School                    |
| 3/14/2005         | Norfolk                | 9                      | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 3/16/2005         | Central Virginia       | 24                     | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 3/17/2005         | Virginia Beach         | 6                      | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 3/20/2005         | Alexandria             | 8                      | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 3/22/2005         | Central Shenandoah     | 15                     | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 3/24/2005         | Norfolk                | 9                      | Varicella (Chickenpox)      | Person to person | Elementary School                    |
| 3/31/2005         | Chesterfield           | 36                     | Norovirus                   | Person to person | Assisted Living                      |

**Table 10. Other Outbreaks Reported in Virginia, 2005 (continued)**

| Onset Date | Health District    | Number of Cases | Etiologic Agent  | Vehicle          | Place Where Outbreak Occurred |
|------------|--------------------|-----------------|--|------------------|-------------------------------|
| April      | Arlington          | 2-5             | Community-acquired Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) | Unknown          | Fire Station                  |
| 4/3/2005   | Central Virginia   | 2               | Meningococcal Infection Suspected  | Unknown          | Household                     |
| 4/4/2005   | Fairfax            | 6               | Norovirus  | Person to person | Possibly a Restaurant         |
| 4/5/2005   | Fairfax            | 5               | Norovirus  | Person to person | Possibly a Restaurant         |
| 4/5/2005   | Fairfax            | 20              | Norovirus  | Person to person | Assisted Living               |
| 4/5/2005   | West Piedmont      | 28              | Varicella (Chickenpox)   | Person to person | Middle School                 |
| 4/6/2005   | Hanover            | 25              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 4/7/2005   | Central Virginia   | 12              | Varicella (Chickenpox)   | Person to person | Middle School                 |
| 4/10/2005  | Thomas Jefferson   | 59              | <i>Bordetella pertussis</i>  | Person to person | Multiple Schools              |
| 4/13/2005  | Peninsula          | 9               | Norovirus  | Person to person | College                       |
| 4/13/2005  | Norfolk            | 30              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 4/19/2005  | Cumberland Plateau | 9               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 4/25/2005  | Virginia Beach     | 12              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 4/28/2005  | Lord Fairfax       | 5               | Norovirus Suspected  | Unknown          | Conference                    |
| 4/28/2005  | Alexandria         | 10              | Varicella (Chickenpox)   | Person to person | Day School                    |
| May        | Arlington          | Unk             | Gastrointestinal Illness   | Unknown          | High School                   |
| May        | Fairfax            | 12              | Norovirus  | Person to person | Homeless Shelter              |
| 5/3/2005   | Lord Fairfax       | Unk             | Norovirus Suspected  | Unknown          | Festival                      |
| 5/4/2005   | Arlington          | 11              | Norovirus Suspected  | Unknown          | Training Program              |
| 5/4/2005   | Fairfax            | 13              | Norovirus  | Person to person | Elementary School             |
| 5/5/2005   | Lord Fairfax       | 12              | Varicella (Chickenpox)   | Person to person | Apartment Building            |
| 5/13/2005  | Thomas Jefferson   | 23              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 5/24/2005  | Norfolk            | 7               | Varicella (Chickenpox)   | Person to person | Middle School                 |
| 6/14/2005  | Fairfax            | 5               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 6/28/2005  | Lord Fairfax       | 5               | Varicella (Chickenpox)   | Person to person | Chicken Processing Company    |
| July       | Prince William     | 1-4             | Enterovirus  | Unknown          | Training Facility             |
| 7/28/2005  | Fairfax            | 5               | Gastrointestinal Illness   | Person to person | Possibly a Restaurant         |
| August     | Richmond City      | 4               | Hepatitis B  | Fomite Suspected | Assisted Living               |
| August     | Richmond City      | 7               | Hepatitis B  | Fomite Suspected | Assisted Living               |

**Table 10. Other Outbreaks Reported in Virginia, 2005 (continued)**

| Onset Date | Health District  | Number of Cases | Etiologic Agent   | Vehicle          | Place Where Outbreak Occurred |
|------------|------------------|-----------------|---|------------------|-------------------------------|
| 8/8/2005   | Thomas Jefferson | 2               | Respiratory Illness                                       | Person to person | Hotel                         |
| 8/12/2005  | Fairfax          | 8               | <i>Bordetella pertussis</i>                               | Person to person | Physician's Office            |
| September  | Lord Fairfax     | 15+             | Respiratory/Pneumonia Illness                             | Unknown          | Migrant Farm Worker Community |
| September  | Lord Fairfax     | Unk             | Cryptosporidiosis   | Unknown          | Day Care                      |
| September  | Lord Fairfax     | 3               | Varicella/Shingles  | Person to person | Jail                          |
| 9/16/2005  | Lenowisco        | 22              | Varicella (Chickenpox)                                    | Person to person | Middle School                 |
| 9/19/2005  | Central Virginia | 6               | Varicella (Chickenpox)                                    | Person to person | Middle School                 |
| 9/20/2005  | Fairfax          | 13-14           | Norovirus   | Person to person | Child Care Center             |
| 9/22/2005  | Virginia Beach   | 7               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 9/29/2005  | Crater           | 6               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 10/3/2005  | Prince William   | 9               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 10/3/2005  | Virginia Beach   | 7               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 10/3/2005  | Peninsula        | 4               | Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) | Person to person | Drug Rehab Center             |
| 10/6/2005  | Virginia Beach   | 25              | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 10/10/2005 | Arlington        | 7               | Varicella (Chickenpox)                                    | Person to person | Middle School                 |
| 10/13/2005 | Central Virginia | 5               | Varicella (Chickenpox)                                    | Person to person | High School                   |
| 10/14/2005 | Virginia Beach   | 2               | <i>Bordetella pertussis</i>                               | Person to person | Middle School                 |
| 10/15/2005 | Chesapeake       | 15              | Varicella (Chickenpox)                                    | Person to person | Middle School                 |
| 10/18/2005 | Rappahannock     | Unk             | <i>Salmonella</i>   | Unknown          | Wedding                       |
| 10/19/2005 | Lord Fairfax     | 7               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 10/20/2005 | Central Virginia | 4               | Gastrointestinal Illness and Fever                        | Person to person | Training Center               |
| 10/21/2005 | Hanover          | 54              | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 10/28/2005 | Richmond City    | 51              | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| November   | Thomas Jefferson | 3               | <i>Bordetella pertussis</i> suspected                     | Person to person | Daycare                       |
| 11/1/2005  | Prince William   | 23              | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 11/1/2005  | Alexandria       | 9               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |
| 11/3/2005  | Fairfax          | 5               | Varicella (Chickenpox)                                    | Person to person | Elementary School             |

**Table 10. Other Outbreaks Reported in Virginia, 2005 (continued)**

| Onset Date | Health District  | Number of Cases | Etiologic Agent          | Vehicle          | Place Where Outbreak Occurred |
|------------|------------------|-----------------|--------------------------|------------------|-------------------------------|
| 11/4/2005  | Fairfax          | 2               | Hepatitis A              | Person to person | Elementary School             |
| 11/8/2005  | Chesapeake       | 5               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 11/10/2005 | Lenowisco        | 1               | Varicella (Chickenpox)   | Person to person | Elementary/Middle School      |
| 11/11/2005 | Central Virginia | 16              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 11/11/2005 | Fairfax          | 9               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 11/15/2005 | Prince William   | 7               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 11/15/2005 | Norfolk          | 12              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 11/17/2005 | Chesapeake       | 6               | Varicella (Chickenpox)   | Person to person | Intermediate School           |
| 11/22/2005 | Norfolk          | 10              | Varicella (Chickenpox)   | Person to person | School                        |
| 11/23/2005 | Norfolk          | 10              | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 11/24/2005 | Fairfax          | 111             | Norovirus Suspected      | Person to person | Daycare                       |
| 11/29/2005 | Chesterfield     | 4               | Gastrointestinal Illness | Unknown          | High School                   |
| 11/30/2005 | Alexandria       | 6               | Varicella (Chickenpox)   | Unknown          | Elementary School             |
| December   | Virginia Beach   | 17              | Gastrointestinal Illness | Person to person | Pre-School                    |
| 12/2/2005  | Thomas Jefferson | 9               | Varicella (Chickenpox)   | Person to person | Middle School                 |
| 12/8/2005  | Fairfax          | 9               | Varicella (Chickenpox)   | Person to person | Elementary School             |
| 12/12/2005 | Norfolk          | 8               | Varicella (Chickenpox)   | Person to person | Elementary/Middle School      |
| 12/20/2005 | Peninsula        | 34              | Gastrointestinal Illness | Person to person | Mental Health Facility        |
| 12/22/2005 | Crater           | 7               | Norovirus                | Person to person | Assisted Living               |
| 12/26/2005 | Peninsula        | 12              | Influenza A              | Person to person | Assisted Living               |
| 12/28/2005 | Loudoun          | 1               | Varicella (Chickenpox)   | Person to person | Middle School                 |

**Table 11. Waterborne Outbreaks Reported in Virginia, 2005**

| Onset Date | Health District | Number of Cases | Etiologic Agent               | Vehicle     | Place Where Outbreak Occurred |
|------------|-----------------|-----------------|-------------------------------|-------------|-------------------------------|
| May        | Piedmont        | Unk             | <i>Legionella pneumophila</i> | Water vapor | Hot Tub                       |
| May        | Norfolk         | 2               | <i>Legionella pneumophila</i> | Water vapor | U.S. Post Office              |

## **Parasites, Other Intestinal**

Agent: Various (e.g., *Necator americanus*, *Strongyloides* spp., *Trichuris trichiura*)

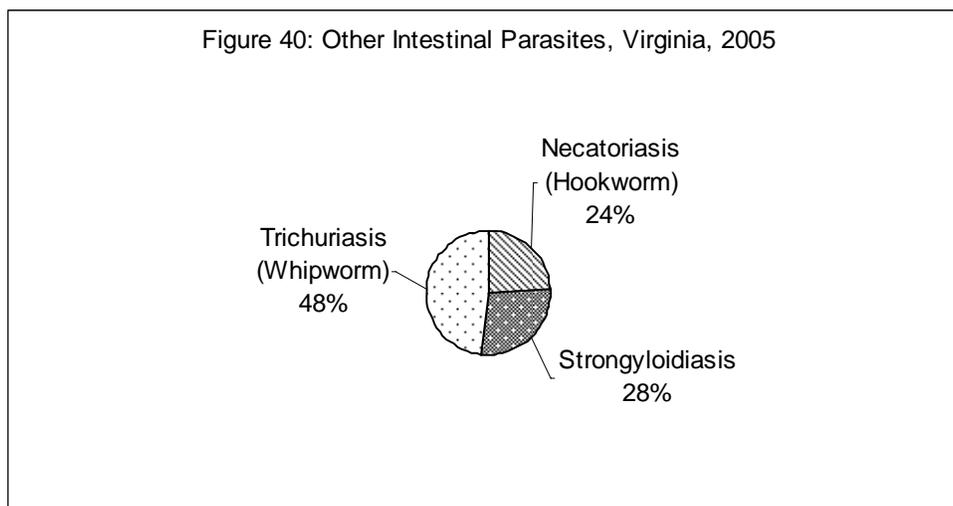
Mode of Transmission: Depends on parasite; transmission can be through the skin or by ingestion of contaminated foods, beverages, or soil.

Signs/Symptoms: Depends on parasite. Symptoms of intestinal parasite infection may range from asymptomatic to diarrhea, abdominal pain, and weight loss.

Prevention: Practicing good personal hygiene (e.g., washing hands with soap), safe food preparation, de-worming dogs and cats, and use of footwear outside.

Other Important Information: Regulations do not require reporting of these parasitic infections. Usually, cases reported in Virginia occur in people who have traveled to other countries.

In Virginia during 2005, laboratory confirmed cases of other intestinal parasites included: six cases of necatoriasis (hookworm), seven cases of strongyloidiasis, and twelve cases of trichuriasis (whipworm) (Figure 40).



Cases were reported from all age groups except infants. The highest rate, 0.6 per 100,000, was seen in the 1-9 year age group. Six cases were reported among the black population (0.4 cases per 100,000 population) and five from both the white and other race category (0.1 case per 100,000 population, each). Race was unknown for nine cases (36%). There were 11 females (44%) and 14 males (56%). The northwest region reported the highest incidence rate (1.0 per 100,000). Rates in the other regions ranged from 0.1 to 0.5 per 100,000.

## **Pertussis**

Agent: *Bordetella pertussis* (bacteria)

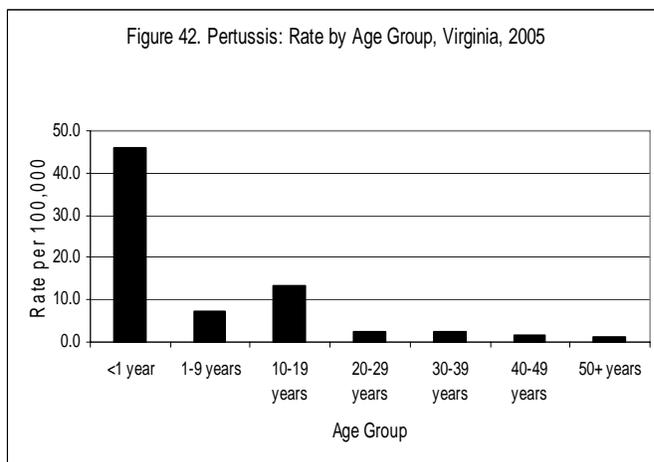
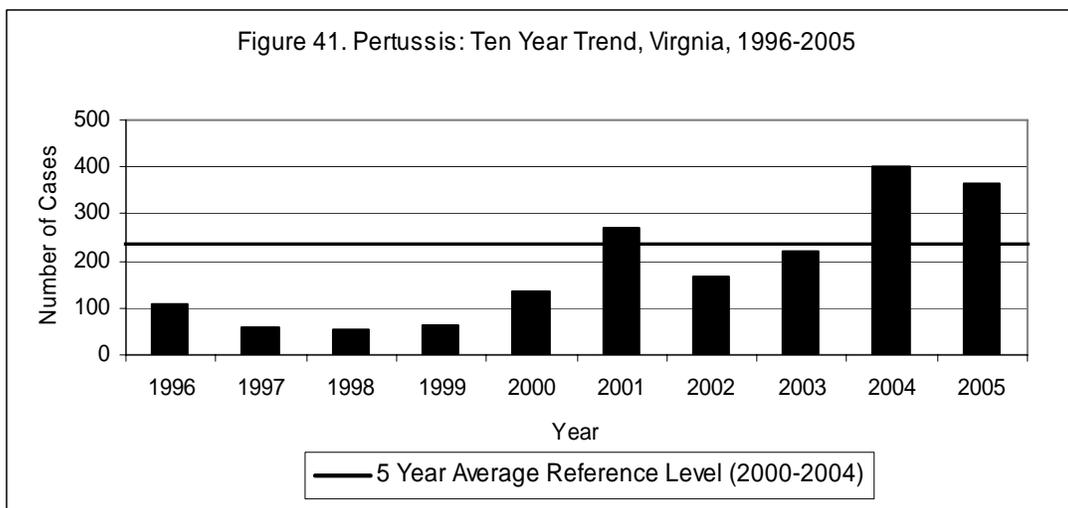
Mode of Transmission: Contact with respiratory secretions from infected patients.

Signs/Symptoms: Insidious cough that progresses to paroxysmal coughing (severe, sequential coughs without the ability to inhale) with post-cough vomiting.

Prevention: Vaccination beginning at 2 months of age.

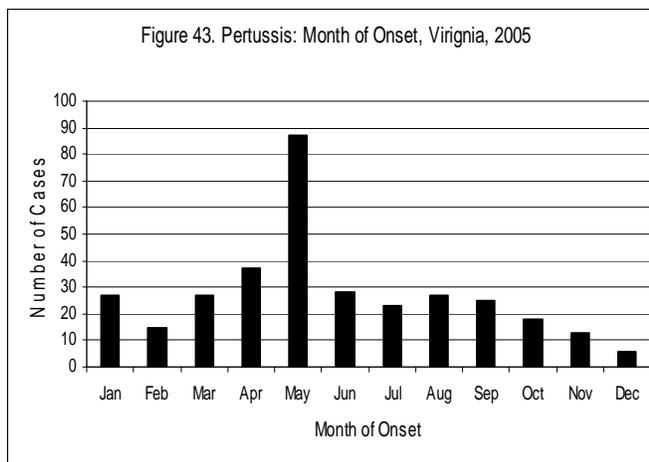
**Other Important Information:** In vaccinated populations the case-fatality rate is low, and deaths generally occur in children less than six months old who are too young to have received the vaccine.

In 2005, 363 cases of pertussis were reported in Virginia. This is a 9% decrease from the 400 cases reported in 2004 and a 52% increase from the five year average of 238.6 per year (Figure 41). The general rise in pertussis cases since 2000 has been seen nationally.



In Virginia, pertussis cases were reported from every age group, but the less than one year age group had the highest incidence rate with 45.9 per 100,000. This was followed by the 10-19 year age group with 13.4 cases per 100,000 population (Figure 42). The white population experienced over twice the incidence rate of the black population (5.4 versus 2.2 per 100,000, respectively). Females had a higher incidence than males (5.5 versus 4.2 per 100,000, respectively).

Among regions, the northwest region reported the highest incidence rate (12.2 per 100,000). This was followed by the southwest region with 4.3 per 100,000 and the northern and eastern regions with 3.7 per 100,000 each. The largest proportion of cases (42%) occurred during the second quarter of the year (Figure 43). Seven pertussis outbreaks were reported in 2005. Most occurred in schools, but there was one community outbreak in February, one physician office outbreak in August, and a suspected outbreak in a daycare facility in November. The largest outbreak occurred in the northwest region in April (59 cases from multiple schools). One death due to pertussis was reported during 2005.



## **Plague**

Agent: *Yersinia pestis* (bacteria)

Mode of Transmission: Transmitted to humans through the bite of infected fleas or through bites/scratches from infected animals (e.g., cats). If the disease attacks the lungs, it may be spread from person-to-person by droplets released when coughing.

Signs/Symptoms: Fever, chills, nausea, headache and body aches. Specific types of plague also lead to other symptoms, such as swollen lymph nodes (“buboes”), bloodstream infections, and pneumonia.

Prevention: In areas where plague occurs, travelers should avoid contact with rodents and fleas and avoid handling stray animals. Persons with plague that results in pneumonia should be isolated until 48 hours after antibiotics have been started.

Other Important Information: Fewer than 20 people in the United States are diagnosed with plague every year. Plague is considered to be one of the agents that could be used for bioterrorism because the disease can be spread from person-to-person and would cause increased illness and death in the population if used as a weapon.

No cases of plague have been reported in Virginia since the nineteenth century.

## **Poliomyelitis**

Agent: Polio virus

Mode of Transmission: Person to person through ingestion of contaminated food or direct contact with fecal material from infected people.

Signs/Symptoms: Ten percent of infections will develop into a non-specific syndrome with fever, malaise, headache, nausea, and vomiting. Flaccid paralysis occurs in 1% of cases.

Prevention: Vaccination beginning at 2 months of age.

Other Important Information: Polio eradication programs have led to the elimination of the disease in the western hemisphere; however, at the end of 2004 six countries still had endemic polio: Afghanistan, Egypt, India, Niger, Nigeria, and Pakistan.

The last reported case of poliomyelitis in Virginia occurred in 1978.

## **Psittacosis**

Agent: *Chlamydophila psittaci* (formerly known as *Chlamydia psittaci*) (bacteria)

Mode of Transmission: Transmission occurs when the bacteria are inhaled from aerosolized dried feces, from respiratory tract secretions, or from dust from feathers of infected birds.

Signs/Symptoms: Most commonly fever, headache, weakness, loss of appetite, muscle aches, chills, sore throat, and cough. They can present as a mild flu-like illness or can be very severe, especially in older persons.

Prevention: Proper design and management of facilities that raise and sell birds and use of protective clothing (e.g., wearing of masks or respirators and gloves) by those working with birds. Bird cages should be cleaned regularly with disinfectants and the contents of the cage should be disposed of properly.

Other Important Information: Birds may or may not show signs of illness when infected. Birds in the parrot family (e.g., cockatiels, parakeets, parrots, macaws) are most commonly responsible for human infection, but any bird species can be infected and, thus, be a source for human disease.

No cases of psittacosis were reported in Virginia during 2005. One case was reported in 2003 and previous to that, one case was reported in 1998.

## **Q Fever**

Agent: *Coxiella burnetii* (bacteria)

Mode of Transmission: Inhalation of air contaminated with dried placental material, birth fluids, or excreta of infected animals; direct exposure to infected animals or tissues; exposure to contaminated material, such as wool, straw, fertilizer, or laundry.

Signs/Symptoms: High fever, severe headache, malaise, muscle aches, confusion, non-productive cough, nausea, diarrhea, abdominal pain, and/or chest pain.

Prevention: Appropriate disposal of potentially infectious tissues and proper hygiene when handling animal birth material.

Other Important Information: Q fever is classified by the Centers for Disease Control and Prevention (CDC) as an agent that could be used for bioterrorism because the disease can be spread from person-to-person and would cause increased illness and death in the population if used as a weapon.

In Virginia, two probable cases of Q fever were reported in 2005. The cases were white males in the 30-39 and 50 years and older age groups. One case was from the northern health planning region and one from the southwest region. One case had traveled to Egypt and Israel and

reported drinking unpasteurized cow milk. The second case reported exposure to a birthing goat. The last reported case in Virginia prior to these two occurred in 1999.

## **Rabies**

Agent: Rabies virus, a rhabdovirus of the genus *Lyssavirus*.

Mode of Transmission: Most commonly transmitted through the bite of an infected animal, but may be transmitted through any method by which virus-infected saliva or central nervous system tissue enters the body.

Signs/Symptoms: Vary widely, but often include an initial headache, fever and apprehension which progresses to paralysis, spasms of the muscles used for swallowing, delirium and convulsions. Once symptoms appear, rabies is almost invariably fatal.

Prevention: Important prevention methods include vaccination of cats and dogs, elimination of stray animals, and avoiding handling wildlife. A pre-exposure vaccine should be given to people at high risk of infection (e.g., veterinarians and laboratorians working with rabies virus). Post-exposure vaccine should be administered to anyone possibly exposed to a rabid animal.

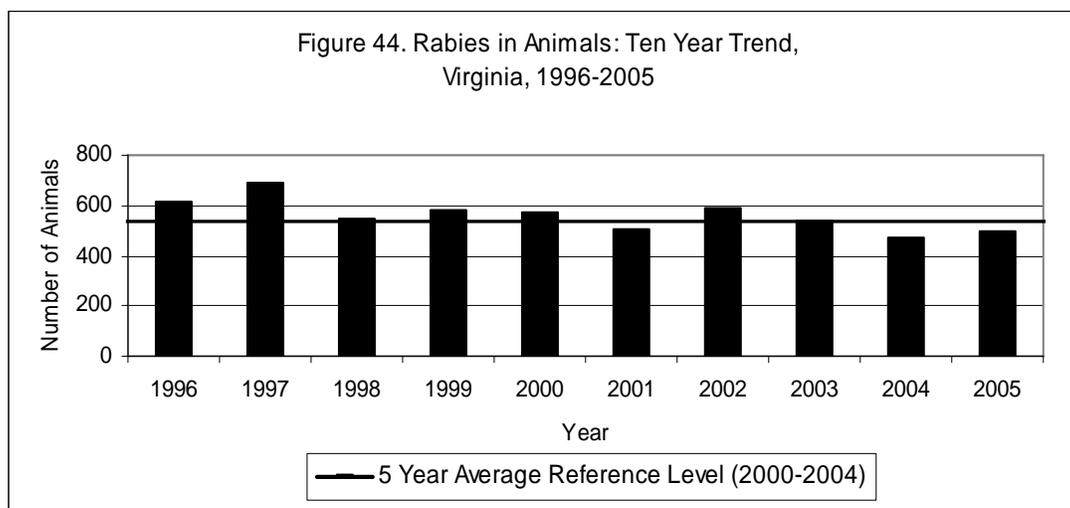
Other Important Information: The main reservoir of rabies in the United States is wildlife. In most other countries, the main reservoir is dogs.

## **Human**

No human cases of rabies were reported in Virginia during 2005. The last reported case was in 2003 in an adult male from the northern region who was infected with a raccoon rabies variant. Though no specific exposure could be determined, the case had lived and worked in an area with endemic raccoon rabies. This was the first instance of a raccoon-variant human rabies infection reported in the United States.

## **Animal**

The number of animals testing positive for rabies increased slightly (4%) from 474 in 2004 to 495 in 2005 (Figure 44). Fairfax Health District (including Fairfax County, Fairfax City, and Falls Church) reported the most positive animals (44, 9%), followed by Loudoun County and Shenandoah County (18 each, 4%). A total of 3,964 animals were tested for rabies and 495 (12%) were positive.

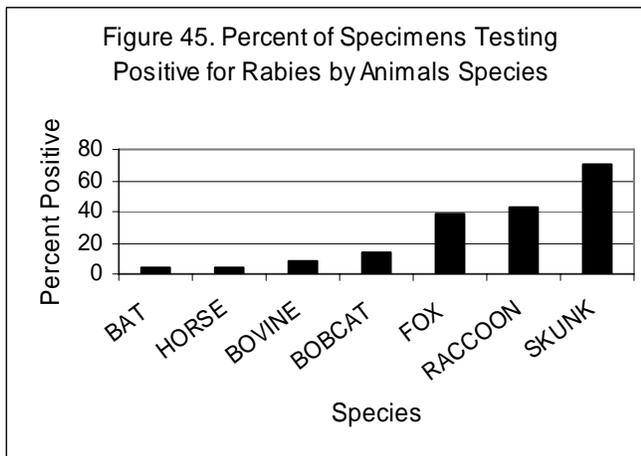


During 2005, reports were received of 145 human exposures to animals that tested positive for rabies. These human exposures included eleven animal species (Table 12).

| <b>Animal Species</b> | <b>Animals Tested</b> | <b>Animals Positive Number</b> | <b>(%)</b> | <b>Human exposures to rabid animals</b> |
|-----------------------|-----------------------|--------------------------------|------------|---|
| Bat                   | 617                   | 24                             | 4%         | 13                                      |
| Bobcat                | 7                     | 1                              | 14%        | 2                                       |
| Cat                   | 1,113                 | 28                             | 3%         | 32                                      |
| Cow                   | 70                    | 6                              | 9%         | 9                                       |
| Dog                   | 671                   | 4                              | 1%         | 8                                       |
| Fox                   | 148                   | 57                             | 39%        | 31                                      |
| Goat                  | 29                    | 1                              | 3%         | 4                                       |
| Horse                 | 52                    | 2                              | 4%         | 2                                       |
| Raccoon               | 582                   | 247                            | 42%        | 33                                      |
| Skunk                 | 192                   | 122                            | 64%        | 11                                      |
| <b>TOTAL</b>          | <b>3,481</b>          | <b>495</b>                     | <b>14%</b> | <b>145</b>                              |

A total of 680 people were reported to have received pre-exposure prophylaxis and 789 people were reported to have received post-exposure prophylaxis in 2005.

The most commonly tested animals included cats (1,113), dogs (671), bats (617), raccoons (582), opossums (199), and skunks (172). Animals with the highest percentage of positive rabies tests included skunks (122 positive, 64%), raccoons (247, 42%), and foxes (57, 39%) (Figure 45).



### **Rocky Mountain Spotted Fever**

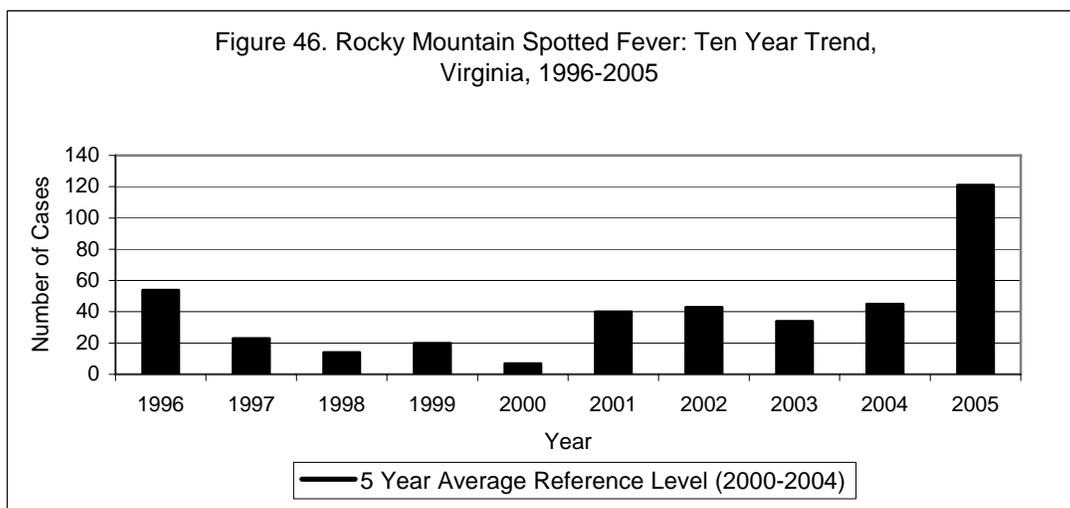
Agent: *Rickettsia rickettsi* (bacteria)

Mode of Transmission: Transmitted to humans by the bite of an infected American dog tick. Ticks must be attached (feeding) for at least 4 to 6 hours to transmit infection.

Signs/Symptoms: Initially include sudden onset of fever, severe headache, and muscle pain. May be followed after four days by development of rash that starts on the hands and feet and spreads to the rest of the body. The rash occurs in only 40% to 60% of afflicted individuals and does not occur until late in the progression of the disease.

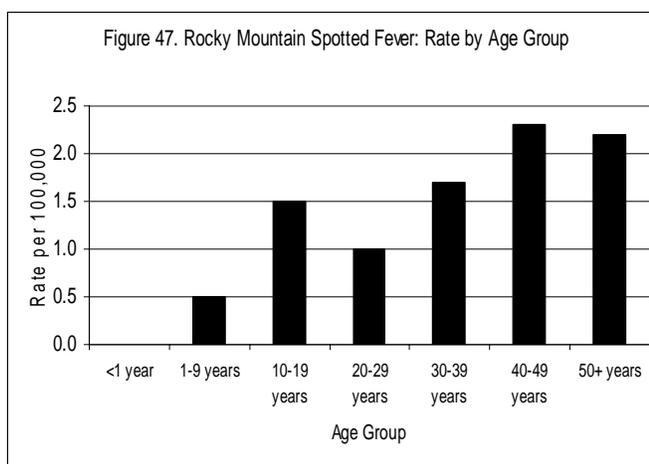
Prevention: Avoid being bitten by ticks: avoid tick prone habitats, wear light colored clothing with pants legs tucked into socks, apply approved repellent, thoroughly check your body for ticks after visiting tick prone habitats and remove attached ticks as soon as possible.

Other Important Information: The disease can be difficult to diagnose in the early stages, but without early intervention, may be fatal in up to 25% of untreated patients.



In 2005, 121 cases of Rocky Mountain spotted fever (RMSF) were reported in Virginia. This is a 169% increase over the 45 cases reported in 2004 (Figure 46). This large increase in cases can be attributed to the fact that more local health department resources are being devoted to following up on laboratory reports of RMSF.

Incidence rates were highest for the 40-49 and 50 year and older age groups (2.3 and 2.2 per 100,000, respectively). This was followed by the 30-39 year age group with 1.6 cases per 100,000 population and the 10-19 year age group with 1.5 cases per 100,000 population (Figure 47). The white population had an incidence rate of 1.7 per 100,000, while the black and other race categories had rates of 0.7 and 0.1 per 100,000, respectively. The male and female populations had the same rate (1.6 per 100,000, each). The eastern and southwest regions experienced the highest incidence rates (2.5 and 2.4 per 100,000, respectively). The other regions had rates between 0.8 and 1.7 per 100,000. Onset of cases occurred primarily (61%) during the third quarter of the year.



## **Rubella**

Agent: Rubella virus

Mode of Transmission: Person to person through contact with nose and throat secretions from infected people. It may also be transmitted from mother to child during pregnancy, causing congenital rubella syndrome (CRS) in the infant.

Signs/Symptoms: Fever and rash.

Prevention: Vaccination, preferably administered as MMR, beginning at 12 months of age.

Other Important Information: Most reported cases of rubella in the US since the mid-1990s have occurred among Hispanic young adults who were born in areas of Latin America or the Caribbean where rubella vaccine has routinely not been given.

No cases of rubella were reported in Virginia during 2005. One case was reported in 1998.

## **Congenital Rubella Syndrome**

No cases of congenital rubella syndrome (CRS) were reported in Virginia during 2005. One case was reported in 2001 in an infant whose mother was an immigrant from South America. That was the first reported case of CRS in Virginia since 1981.

## **Salmonellosis**

Agent: *Salmonella* (bacteria)

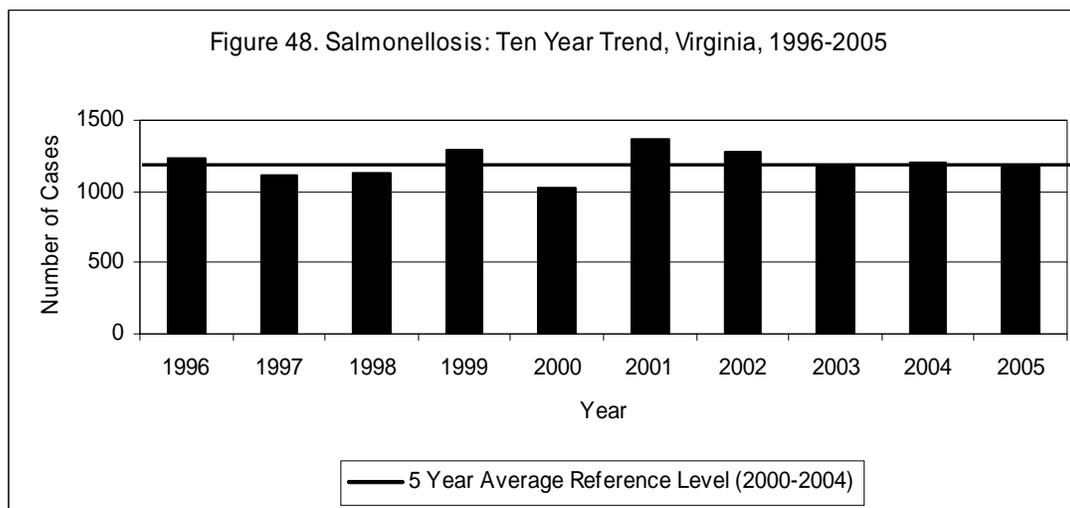
Mode of Transmission: Eating contaminated food (particularly undercooked eggs and poultry) or drinking contaminated water. Infected persons can spread the bacteria by not washing their hands after going to the bathroom and then handling food that other people will eat. Another way to get this disease is by having direct contact with feces from an infected person or animal and then transferring the bacteria to the mouth from the hands.

Signs/Symptoms: Sudden onset of headache, fever, abdominal pain, diarrhea and sometimes vomiting. Dehydration, especially in the elderly and young children, can be a severe complication.

Prevention: Proper sanitation methods for food preparation (including preventing cross-contamination of food preparation surfaces), sanitation of water supplies, proper hand hygiene, sanitary sewage disposal, exclusion of infected people from handling food or providing health care, prohibiting the sale of pet turtles and restricting the sale of other reptiles for pets. Eggs and other foods of animal origin should be cooked thoroughly.

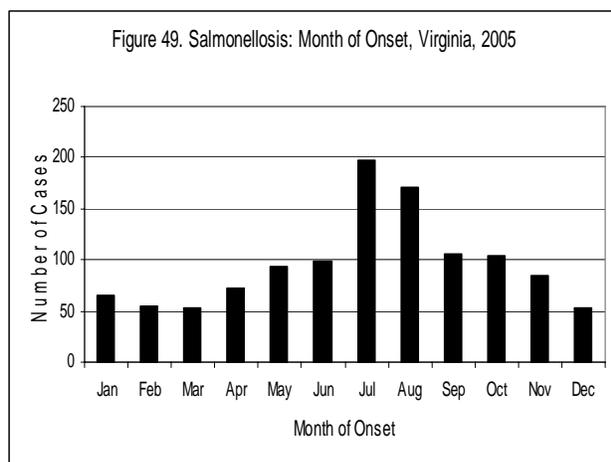
Other Important Information: The incidence rate is highest among infants and young children. Rates of mortality are higher in infants, elderly people and people with immunosuppressive conditions.

There were 1,172 cases of salmonellosis reported in Virginia during 2005. This is similar to the 1,196 cases reported in 2004, and a 3% decrease from the five year average of 1,207.2 cases per year (Figure 48).



By far, the highest incidence rate was reported in infants (102.8 per 100,000). This was followed by the 1-9 year age group (31.3 per 100,000). The other age groups all reported similar rates of infection (between 11.9 and 12.3 per 100,000). A higher incidence rate was reported in the white population (10.8 per 100,000) than in the black population (8.0 per 100,000) and females had a higher rate (16.0 per 100,000) than males (14.6 per 100,000).

The central region reported the highest incidence rate (19.6 per 100,000), followed by southwest, with 16.9 cases per 100,000 population. While cases occur throughout the year, there is a notable increase during the warmer months, with 40% of cases occurring during the third quarter of the year (Figure 49). Three foodborne outbreaks of *Salmonella* infection were reported in 2005, involving serotypes Enteritidis, Hartford, and Typhimurium. One outbreak also occurred in a daycare setting (2 cases), with an unknown vehicle of transmission. The largest percentage of infections was due to *Salmonella typhimurium* (Table 13).



**Table 13. Number and Percent of *Salmonella* Infections by Serotype, Virginia, 2005**

| Serotype Causing Infection | Number of Cases | Percent of Cases |
|----------------------------|-----------------|------------------|
| <i>S. ser. Typhimurium</i> | 268             | 22.8             |
| <i>S. ser. Enteritidis</i> | 224             | 19.1             |
| <i>S. ser. Newport</i>     | 98              | 8.3              |
| <i>S. ser. group B</i>     | 46              | 3.4              |
| <i>S. ser. Heidelberg</i>  | 41              | 3.5              |
| <i>S. ser. Hartford</i>    | 40              | 3.4              |
| <i>S. ser. Javiana</i>     | 27              | 2.3              |
| <i>S. ser. Saintpaul</i>   | 24              | 2.1              |
| <i>S. ser. Bareilly</i>    | 16              | 1.4              |
| <i>S. ser. Infantis</i>    | 14              | 1.2              |
| Unspecified                | 164             | 13.9             |
| All Others                 | 212             | 18.1             |
| <b>TOTAL*</b>              | <b>1,174</b>    | <b>100</b>       |

\*The total number of serotypes is larger than the total number of *Salmonella* infections because a person may be infected with more than one serotype at the same time.

## **Severe Acute Respiratory Syndrome**

**Agent:** Severe acute respiratory syndrome (SARS)-associated coronavirus (SARS-CoV)

**Mode of Transmission:** Most likely transmitted from person to person through coughing and sneezing; spread can also occur by touching a contaminated surface/object and then touching the mouth, nose, or eyes. It is possible that SARS-CoV might be spread more broadly through the air or by other routes that are not yet known.

**Signs/Symptoms:** Weakness, muscle pain, and fever followed by respiratory symptoms, such as cough and shortness of breath. Diarrhea may occur.

**Prevention:** Factors that may reduce transmission include: frequent hand washing; avoidance of touching the eyes, nose, and mouth with contaminated hands; and covering the nose and mouth with a tissue when coughing or sneezing.

**Other Important Information:** Major outbreaks of SARS occurred between November 2002 and July 2003 in Canada, China, Singapore and Vietnam. In the United States, eight people had laboratory evidence of SARS-CoV infection. SARS is thought to have originated in China.

One case of SARS was confirmed in Virginia during the international outbreaks in 2003. The case was a female in the 50 years and older age group who had traveled to Taiwan, Malaysia and Singapore in the four weeks before onset of symptoms. Her exposure most likely occurred in a Singapore hospital, where she had direct contact with patients being treated for SARS. No cases of SARS were reported in Virginia during 2005. Active global surveillance for SARS has detected no person to person transmission of SARS since July 2003.

## **Shigellosis**

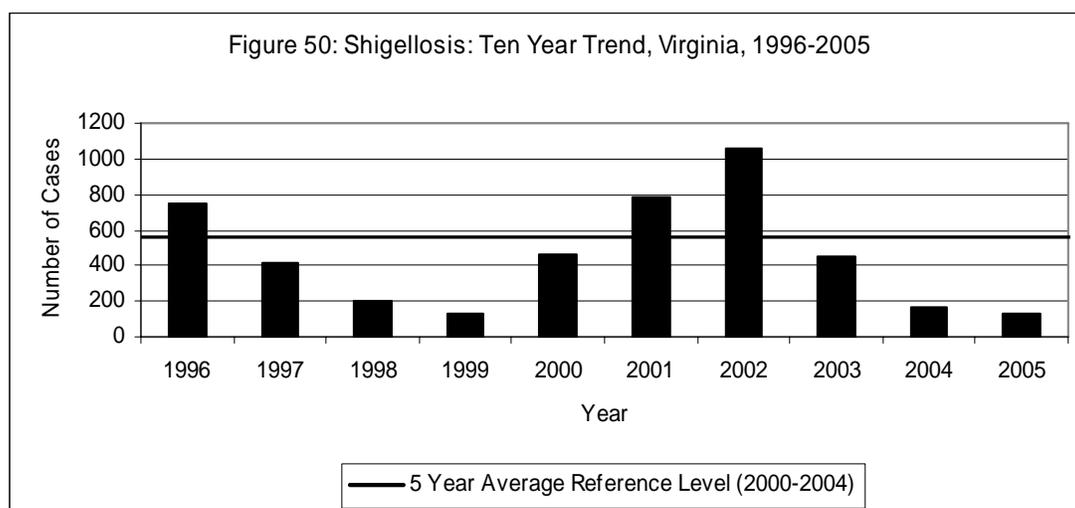
**Agent:** *Shigella* (bacteria)

**Mode of Transmission:** The primary mode is fecal-oral via person to person contact. Additionally, contact with a contaminated inanimate object, ingestion of contaminated food or water and sexual contact may spread the disease.

**Signs/Symptoms:** Characterized by diarrhea (ranging from watery and loose to mucoid with or without blood), fever and sometimes nausea, vomiting, abdominal cramps and painful straining at stool or urination. Mild and asymptomatic infections can occur.

**Prevention:** Strict attention to hand hygiene is essential to limit transmission. Additional control measures include improved sanitation, chlorination of drinking water, proper cooking and storage of food, the exclusion of infected persons as food handlers and measures to decrease contamination of food by houseflies.

During 2005, 134 cases of shigellosis were reported in Virginia. This is a 20% decrease from the 167 cases reported in 2004, and a 77% decrease from the five year average of 584.6 cases per year (Figure 50).



The 1-9 year age group had the highest incidence rate (49 cases, 5.6 per 100,000). The other age groups had rates between 1.0 per 100,000 (50 years and older) and 4.0 per 100,000 (infants). Race data was missing for 43% of reports. Among reports with a reported race, the black population had a higher rate (1.7 per 100,000) than the white population (0.9 per 100,000). Males had a slightly higher rate than females (1.9 versus 1.7 per 100,000, respectively). The northern region reported the highest incidence rate (3.3 per 100,000). The other regions reported rates between 1.0 and 1.7 per 100,000. A seasonal trend was observed; the largest proportion of cases (61%) occurred from April to September.

## **Smallpox**

Agent: Variola virus

Mode of Transmission: Spread from person to person through contact with respiratory droplets, airborne particles (rare), and skin lesions of an infected person. Smallpox can also be transmitted through contact with contaminated clothing or bedding.

Signs/Symptoms: Sudden onset of fever, headache, weakness and exhaustion followed by development of a rash that first appears on the face and extremities.

Prevention: Routine vaccinations among the American public stopped in 1972.

Other Important Information: The last case of smallpox in the United States was in 1949; the last naturally occurring case in the world was in Somalia in 1977. Smallpox is considered to be one of the agents that could be used for bioterrorism because the disease can be spread from person to person and would cause increased illness and death in the population if used as a weapon.

The last case of smallpox in Virginia occurred in 1944.

## **Streptococcal Disease, Group A, Invasive**

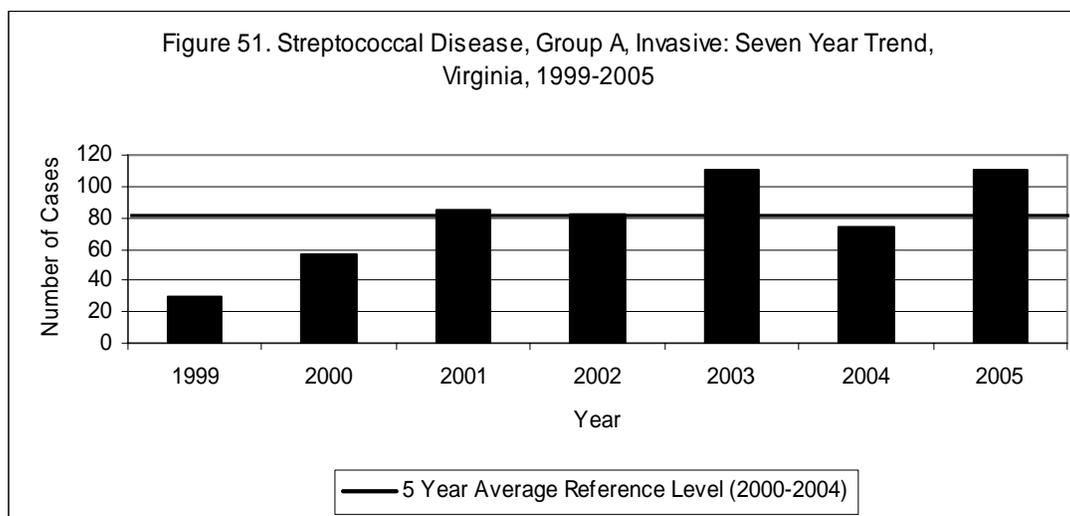
Agent: *Streptococcus pyogenes* (bacteria)

Mode of Transmission: Person to person by respiratory droplets or through direct contact.

Signs/Symptoms: Depending on the site of infection (e.g., skin, blood, throat, etc.), infection can result in no illness; mild illness (sore throat, fever, or skin infections); or severe illness (infection of the soft tissue or toxic shock syndrome).

Prevention: Prompt identification and treatment of cases and temporary exclusion of infected healthcare employees from work for the first 24 hours of antibiotic therapy.

During 2005, 110 cases of invasive streptococcal disease, group A (GAS) were reported in Virginia. This is a 49% increase from the 74 cases reported in 2004, and a 34% increase over the five year average of 81.8 cases per year, but is similar to the number of cases seen in 2003 (111) (Figure 51).



The highest incidence rate was reported in the 50 years and older age group (2.5 per 100,000), followed by the less than 1 year age group (2.0 per 100,000). The white and black populations had similar incidence rates (1.3 and 1.4 per 100,000, respectively), and females had a slightly higher incidence rate than males (1.6 versus 1.3 per 100,000, respectively). The northwest region reported the highest number of case and highest incidence rate (25 cases, 2.2 per 100,000). The largest proportion of cases was reported during fourth quarter of the year (31%). Eleven deaths due to GAS were reported during 2005.

### **Streptococcus pneumoniae, Invasive, in Children Less than 5 Years of Age**

Agent: *Streptococcus pneumoniae* (bacteria)

Mode of Transmission: Person to person via droplet spread or by direct contact with oral secretions from persons carrying the bacteria in their upper respiratory tract.

Signs/Symptoms: Pneumonia (a lung infection), bacteremia (blood stream infection), and meningitis (infection of the lining of the brain and spinal cord).

Prevention: Routine immunization with pneumococcal conjugate vaccine as a 4-dose series for infants at 2, 4, 6, and 12 to 15 months of age.

Other Important Information: With the decline of invasive Hib disease, *S. pneumoniae* has become the leading cause of bacterial meningitis among children <5 years of age in the US.

Thirty-seven cases of invasive *S. pneumoniae* infection in children less than 5 years of age were reported in Virginia during 2005. This is a 6% increase over the 35 cases reported in 2004 and the fourth consecutive increase in cases reported since 2001. A higher incidence rate was seen in infants (14.0 cases per 100,000 population) than in children between 1-4 years of age (5.5 per 100,000). The white population had a higher incidence rate (7.0 per 100,000) than the black population (5.4 per 100,000). Males also had a higher rate of *S. pneumoniae* infection (7.9 per 100,000) than females (6.6 per 100,000). The northwest region had the highest incidence rate (28.4 per 100,000). Rates in other regions ranged from 1.3 to 7.2 per 100,000. Eighty-one percent of cases occurred during the first and second quarters of the year. One death due to *S. pneumoniae* infection was reported in an infant.

## **Syphilis**

**Agent:** *Treponema pallidum* (bacteria)

**Mode of Transmission:** Through sexual intercourse, from mother to child through the placenta, and via blood transfusion from an infected donor in the early stage of disease.

**Signs/Symptoms:** The primary stage is characterized by a chancre. The secondary stage includes a skin rash and lesions of the mucous membranes. A latent period follows with no clinical symptoms. In late syphilis, the central nervous system may become sufficiently damaged to cause death.

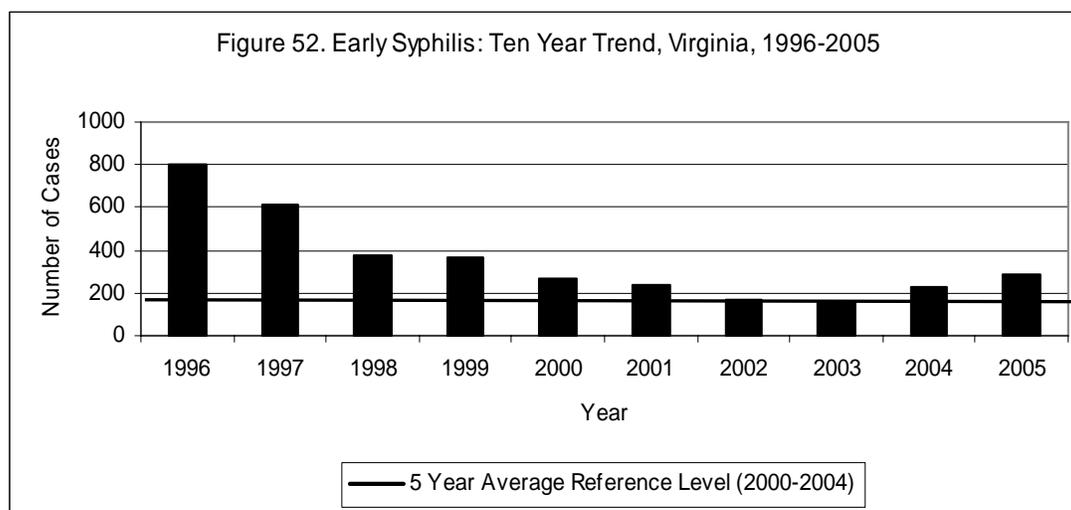
**Prevention:** Safe sexual practices, screening of all women during early pregnancy to prevent infection of infants, and treatment of infected partners.

**Other Important Information:** Nationwide, the rate of primary and secondary syphilis is on the rise for two important populations: men who have sex with men (MSM) and blacks. For additional information see <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5510a1.htm>

### **Early Syphilis**

Early syphilis includes the primary and secondary stages (symptomatic) and early latent syphilis (cases diagnosed within one year from the time of infection).

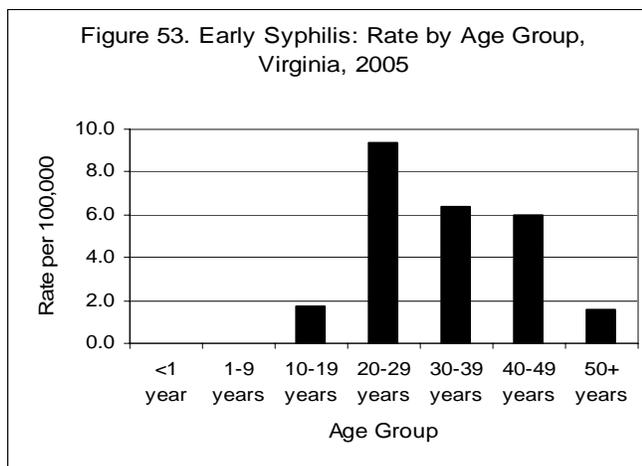
There were 291 cases of early syphilis reported in Virginia during 2005. This is a 30% increase from the 224 cases reported in 2004 and a 39% increase from the five year average of 209.2 cases per year (Figure 52).



The highest incidence rate occurred in the 20-29 year age group (9.4 per 100,000), followed by the 30-39 year age group (6.4 per 100,000) (Figure 53). The incidence in the black population was more than seven times that in the white population (12.3 versus 1.6 per 100,000), and the rate in males (6.3 per 100,000) was almost 4 times the rate in females (1.6 per 100,000). From 2004-2005 the rate of reported syphilis in females increased from 0.8 to 1.6 per 100,000. The

eastern region reported the highest rate (7.8 per 100,000), followed by the northern region (4.2 per 100,000).

A syphilis outbreak of primary, secondary, and early latent stage cases peaked in Suffolk, Virginia in October, 2005. The incidence rate in Suffolk reached 41.7 cases per 100,000 population in 2005 compared to only 3.9 cases per 100,000 population in 2004. The 2005 rate in Suffolk is similar to San Francisco, California, which had the highest primary rate of syphilis of any U.S. city in 2004 (45.9 per 100,000).



### Congenital Syphilis

Four cases of congenital syphilis were reported in Virginia during 2005, compared to three cases reported in 2004. Among the four cases reported in 2005, three were black and one was white. All four cases were female. Two were reported from both the eastern and northern regions. A rise in total early syphilis cases has contributed to an increase in congenital syphilis.

### Late Syphilis

In 2005, 361 cases of late syphilis were reported in Virginia. This is a 5% decrease from the 380 cases reported in 2004. The incidence rate in the black population was 14.3 per 100,000 compared to 1.2 per 100,000 in the white population, and the rate in males was 6.1 compared to 4.0 per 100,000 in females.

The highest incidence rate was reported in the 40-49 year old age group (9.4 per 100,000). Among the 50 year and older age group, those 80-89 years of age had the highest incidence rate of late syphilis (8.5 per 100,000). The northern and eastern regions reported the highest incidence rates (6.8 per 100,000 each), followed by the central region (4.9 per 100,000).

### Tetanus

Agent: Toxin secreted by the bacteria *Clostridium tetani*

Mode of Transmission: Usually transmitted when a wound is infected by contaminated soil, dust, or animal or human feces.

Signs/Symptoms: A descending pattern of painful muscle contractions, particularly of the neck muscles; difficulty swallowing; and abdominal rigidity.

Prevention: Tetanus vaccine is available as part of the diphtheria/tetanus/pertussis (DTaP) vaccine for children and as a new combination tetanus/diphtheria/pertussis (Tdap) vaccine for

adolescents and adults. One dose of Tdap should be given at 11 to 12 years of age with booster doses of Td following every ten years after that.

Other Important Information: The case-fatality rate of tetanus ranges from 10% to 80% and depends on the length of incubation and the availability of experienced medical personnel.

One case of tetanus was reported in Virginia during 2005. The case was a white female in the 50 year and older age group, from the eastern region. One case was reported in 2004. Prior to 2004, the last reported case of tetanus in Virginia occurred in 1998.

## **Toxic Shock Syndrome**

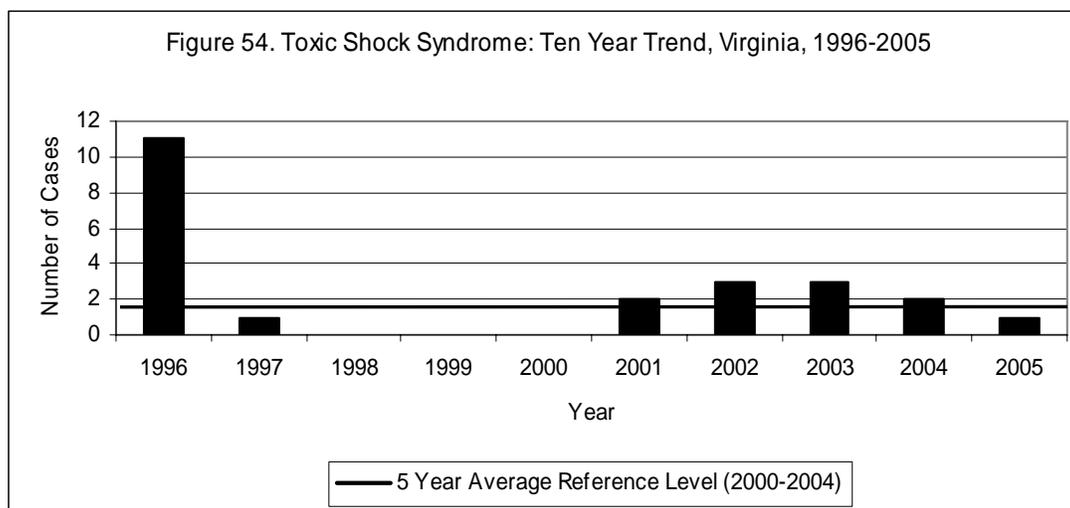
Agent: *Staphylococcus aureus* or beta-hemolytic streptococci (bacteria)

Mode of Transmission: Person to person spread through direct contact or through contact with contaminated materials or surfaces.

Signs/Symptoms: Sudden onset of high fever, rash, vomiting, watery diarrhea, and muscle pain, followed by a drop in blood pressure, and shock (severe cases).

Prevention: Practice good hand hygiene, clean skin abrasions, and eradicate *S. aureus* and *Streptococcus pyogenes* from draining wounds.

Other Important Information: The majority of early cases were reported in women during menses; however, in recent years only 55% of cases have been reported among women of child-bearing age.



One case of TSS due to *Staphylococcus aureus* was reported in Virginia during 2005, consistent with the average of less than two cases per year during the previous five years (Figure 54). The case was reported in a white female from the 10-19 year age group from the eastern region.

## **Toxic Substance-Related Illness**

Agent: Multiple, including pesticides, heavy metals (lead, cadmium, mercury, arsenic), occupational dusts or fibers (coal, silica, asbestos), or radioactive materials.

Mode of Transmission: Varies depending on agent; can include absorption through skin, ingestion, or inhalation.

Signs/Symptoms: Varies depending on agent. Chronic occupational dust or fiber exposure may increase the risk of lung cancer, mesothelioma and nonmalignant lung disorders. Heavy metals and pesticides may damage nervous, digestive, or reproductive systems.

Prevention: Do not eat, drink, or smoke in contaminated work areas. Wash hands and face after contacting toxic materials; shower and change clothes at work if possible. Always follow safety guidelines and requirements.

Other Important Information: Improving public and healthcare professional awareness and recognition of various toxic substance exposures can help reduce subsequent illness.

During 2005, 319 incidences of adult toxic substance-related illness were reported in Virginia. The three most frequently reported toxic substance-related illnesses were: lead exposure (138, 43%); pneumoconiosis (118, 37%); and asbestosis (42, 13%). Among those with pneumoconioses (including coal workers pneumoconiosis), 86.4% worked in the coal mining industry. The southwest region of the state, where most of the coal industry is located, had the highest incidence of reported exposures (217, 68%), followed by the eastern region (55, 17%). Children with exposure to lead are not discussed in this section. For this information, see “Lead-Elevated Blood Lead Levels in Children” section.

## **Trichinosis**

Agent: Roundworms of genus *Trichinella* (*T. spiralis* is the most common cause of human infection).

Mode of Transmission: Eating undercooked contaminated meat (including bear, pork, wild feline [such as a cougar], fox, dog, wolf, horse, seal, or walrus).

Signs/Symptoms: Ingestion of infected meat, symptoms include nausea, diarrhea, vomiting, fatigue, fever, and abdominal discomfort. Headaches, fevers, chills, cough, eye swelling, aching joints and muscle pains, itchy skin, diarrhea, or constipation may follow. Individuals may be asymptomatic, but severe infections can cause death.

Prevention: Cook all pork products and meat from wild animals to 160 degrees Fahrenheit.

Other Important Information: Trichinosis is not transmitted from person to person. Infected meat will remain infective until it has been properly cooked, cured, frozen or irradiated.

One case of trichinosis was reported in Virginia during 2005 in a 20-29 year old male from the northern region. One case was also reported in 2004. Previous to that, the last reported case occurred in 1993.

## **Tuberculosis**

**Agent:** *Mycobacterium tuberculosis* (bacteria)

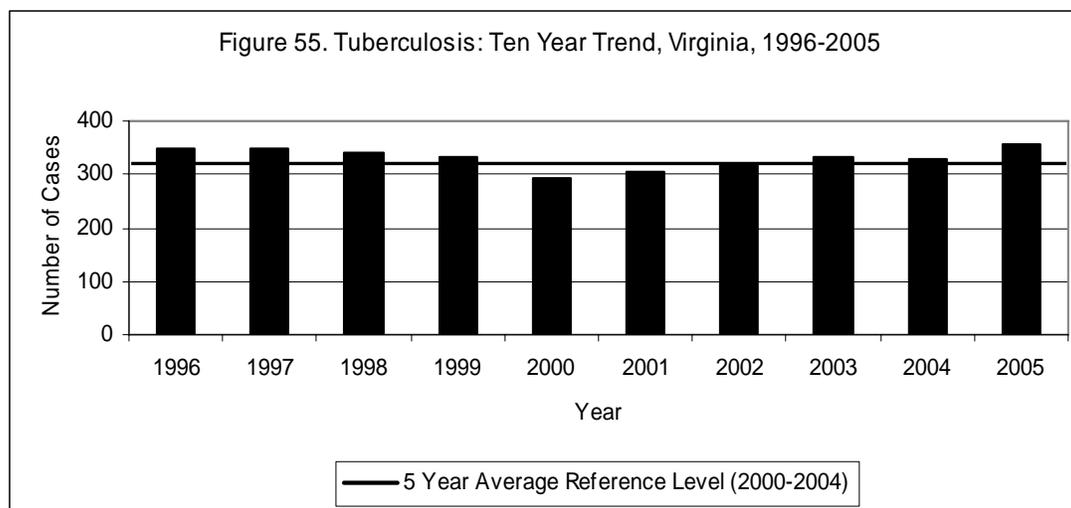
**Mode of Transmission:** Inhalation of tubercle bacilli via respiratory droplets when patients with pulmonary or respiratory tract tuberculosis exhale the bacilli through coughing, singing, or sneezing.

**Signs/Symptoms:** Dependent on the organ(s) affected. General systemic signs and symptoms include fever, chills, night sweats, weight loss and fatigue. Symptoms of pulmonary tuberculosis include the systemic symptoms and may also include a prolonged productive cough (greater than 3 weeks) and coughing up blood.

**Prevention:** Prompt identification, diagnosis and treatment of persons with infectious tuberculosis. Timely contact investigations to identify and treat additional persons with active tuberculosis disease and persons with latent tuberculosis infection. Infection control measures in high-risk settings.

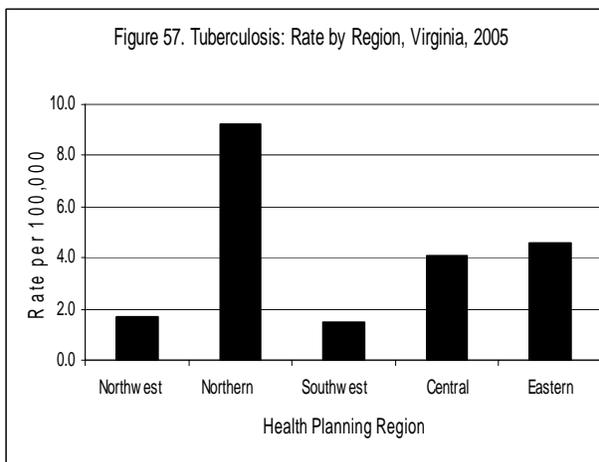
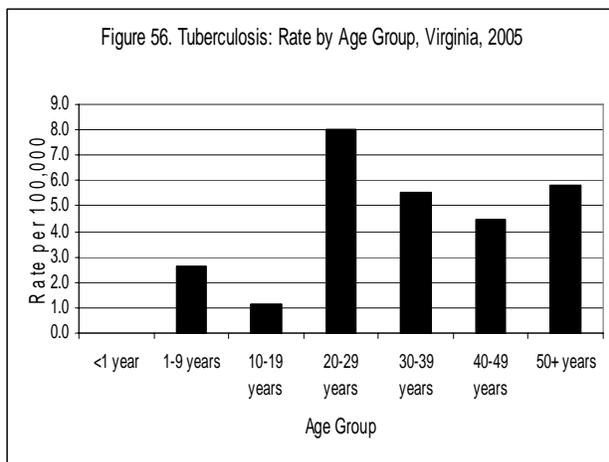
**Other Important Information:** About 10% of those infected with TB will develop active disease during their lifetime, with the greatest risk for disease progression during the two years following infection. Co-infection with HIV and other immune suppressing conditions represent the greatest risks for progression to active disease.

The 355 tuberculosis cases reported in 2005 was an 8% increase from the 329 cases reported in 2004 (Figure 55). Initial drug resistance to first-line drugs was found in 29 cases in 2005, compared to 13 in 2004. Among Virginia's tuberculosis cases, 63% were foreign born. They made up 89% of cases in the northern region, which had the most foreign born cases, and 32% of cases in the southwest, the region with the lowest number of cases in the foreign born. Foreign born cases included people from 45 different countries. Their time of residence in the U.S. ranged from less than one year to more than 50 years.



Among age groups, the highest incidence rate occurred in the 20-29 year age group, with 8.0 cases per 100,000 population, followed by the 50 years and older age group (5.8 per 100,000)

and the 30-39 year age group (5.5 per 100,000). No cases were reported in infants (Figure 56). By race, the highest incidence rate was reported in the black population (7.5 per 100,000), followed by the white and other race categories (2.5 and 2.2 per 100,000, respectively).



Males had a slightly higher rate (5.0 per 100,000) than females (4.6 per 100,000). The northern region reported the highest number of cases and highest incidence rate (182 cases, 9.2 per 100,000) and the lowest rate was seen in the southwest region (1.5 per 100,000) (Figure 57). It is noteworthy that every health district in the state reported at least one tuberculosis case.

## **Tularemia**

**Agent:** *Francisella tularensis* (bacteria)

**Mode of Transmission:** In the United States, by the bite of an infected tick such as the American dog tick (*Dermacentor variabilis*), the lone star tick (*Amblyomma americanum*), or occasionally by the bite of an infected deer fly. Hunters can contract the disease while cleaning infected game or when eating poorly cooked infected meat. Humans may also become infected by drinking contaminated water, or by breathing *F. tularensis* spores from the dried carcasses or pelts of animals that died from tularemia.

**Signs/Symptoms:** Vary depending on the mode of transmission, but usually include sudden onset of high fever, chills, fatigue, general body aches, headache and nausea. Pneumonia may complicate the disease and requires prompt identification and specific treatment to prevent development of serious, life threatening illness.

**Prevention:** Avoid the bites of ticks or deer flies and avoid untreated water in areas where tularemia is prevalent among wild animals. Use impervious protective gloves when skinning rabbits and other wild game. Avoid contaminating other food items with utensils used for preparing meat from game and do not eat undercooked meat.

**Other Important Information:** Tularemia is classified as a potential bio-weapon because its spores are relatively easy to disseminate as a breathable aerosol or as a food and water contaminant.

No cases of tularemia were reported in Virginia during 2005 or 2004. Four cases were reported in 2003.

## **Typhoid Fever**

Agent: *Salmonella typhi* (bacteria)

Mode of Transmission: Ingestion of food or water contaminated by feces and urine of patients and carriers. The bacteria only live in humans.

Signs/Symptoms: Include a sustained fever, headache, malaise, and change in mental status, lethargy, anorexia, fast heart rate, enlarged spleen, a non-productive cough and constipation.

Prevention: Access to safe water and proper sanitation as well as following safe food handling practices are essential. Typhoid fever vaccine should be considered for travelers to a country where the disease is common.

Twenty cases of typhoid fever were reported in Virginia during 2005. This is 82% increase from the 11 cases reported in 2004 and a 39% increase from the five year average of 14.4 cases per year. A travel history was obtained for 10 (50%) of these cases and all had traveled outside of the United States in the 30 days prior to onset of illness.

By age, the highest incidence rate occurred in the 1-9 year age group (0.9 per 100,000), followed by the 10-19 year age group (0.6 per 100,000). The other age categories had rates between 0 and 0.3 cases per 100,000 population. A large proportion (45%) of reports were missing race data. Among cases with a reported race, the other race category had the highest number of cases and incidence rate (8 cases, 0.2 per 100,000). Females and males were reported with similar rates (0.3 and 0.2 per 100,000, respectively). Cases were reported from the northern region (0.8 cases per 100,000 population) and eastern region (0.4 cases per 100,000 population). Over half (55%) of the cases had onset dates during the third quarter of the year.

## **Typhus**

Agent: Any of three distinct rickettsial bacteria species. Epidemic typhus is caused by *Rickettsia prowazekii*. Endemic typhus is caused by *R. typhi* or *R. felis*. Scrub typhus is caused by *Orientia tsutsugamushi*.

Mode of Transmission: Epidemic typhus is transmitted by human lice or by squirrel fleas. Endemic typhus is carried by rat fleas. Epidemic and endemic typhus may be also be contracted by inhalation of dust containing infected louse or flea feces. Scrub typhus is transmitted only by the bite of infected mites.

Signs/Symptoms: Epidemic typhus often presents with sudden headache, fever, chills, prostration, and body pain. A macular rash erupts on the 5<sup>th</sup> or 6<sup>th</sup> day in approximately half of the patients. The clinical course of endemic typhus is similar to that for epidemic typhus, but milder. The initial symptom of scrub typhus is usually a skin ulcer at the site of the mite bite followed by a febrile illness with headache, profuse sweating, conjunctival injection and enlargement of lymph nodes.

Prevention: Typhus infected patients serve as the disease reservoirs for lice in epidemic typhus, so identification, isolation/quarantine, and treatment of infected patients is necessary to stop the transmission cycle. Other important practices include improved sanitation and the use of insecticides for delousing infested people or for controlling rat fleas before using rodenticides (for endemic typhus). These diseases are rare in the United States.

No cases of typhus were reported in Virginia during 2005. The last case was flea-borne (endemic) typhus reported in 1993.

### **Vaccinia, Disease or Adverse Event**

Agent: The vaccinia virus, which is used in smallpox vaccine.

Mode of Transmission: Transmitted through injection with the smallpox vaccine or through direct contact with the vaccine site or contaminated materials.

Signs/Symptoms: Include rash, fever and head and body aches. Some individuals, especially those with certain skin conditions or weakened immune systems, may experience more serious effects such as a toxic or allergic reaction at the site of the vaccination or spread of the virus to other parts of the body.

Prevention: When smallpox is not circulating, in order to prevent serious reactions to the vaccine only laboratory workers who handle smallpox and certain health care workers are recommended to receive the smallpox vaccine.

Other Important Information: The U.S. government has enough smallpox vaccine to vaccinate every person in the United States in the event of a smallpox emergency.

Vaccinia became a reportable condition in Virginia in 2003. Since then, no cases of vaccinia have been reported in Virginia.

### **Vancomycin-Resistant *Staphylococcus aureus* Infection**

Agent: *Staphylococcus aureus* (bacteria) that has developed resistance to the antibiotic vancomycin.

Mode of Transmission: Person to person spread through direct contact or through contact with contaminated materials or surfaces.

Signs/Symptoms: Depends on site of infection (e.g., skin, bone, urinary and respiratory tract) and may cause toxic shock syndrome (see TSS section above); asymptomatic colonization can occur.

Prevention: Appropriate use of antibiotics to treat infections, good hand hygiene, and proper cleaning of contaminated surfaces.

No cases of VRSA infections have ever been reported in Virginia.

### **Vibrio Infection**

Agent: *Vibrio* (bacteria)

Mode of Transmission: Gastroenteritis is usually related to the consumption of raw or undercooked seafood, particularly shellfish. Wound infections arise from environmental exposures, usually from brackish waters or from occupational injuries (e.g., among fishermen).

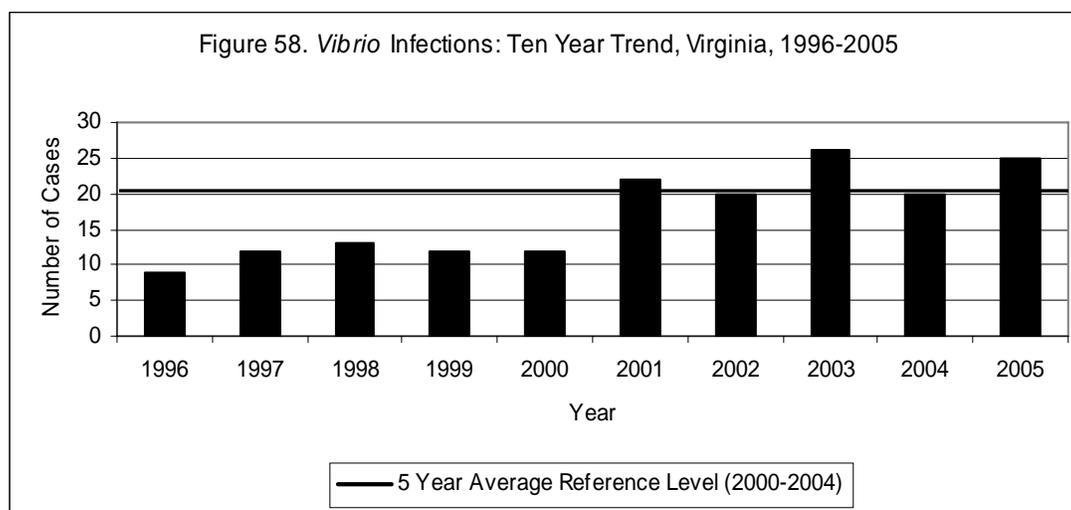
Signs/Symptoms: Diarrheal illness is most common and includes watery stools, cramping, and abdominal pain. Low-grade fever, headache and chills are seen in half of those ill with diarrheal

illness and vomiting is present in 30%. Wound infection is usually severe in those who have liver disease or are immunosuppressed.

**Prevention:** Seafood should be cooked adequately and should be refrigerated. Abrasions suffered by ocean bathers should be rinsed with clean fresh water. Children, immunosuppressed persons and those with chronic liver disease should not eat raw oysters or clams.

**Other Important Information:** Most *Vibrio* infections occur during summer and fall months, when their populations in seawater are highest.

During 2005, 25 cases of *Vibrio* infection were reported in Virginia. This is a 25% increase from the 20 cases reported in 2004 (Figure 58). Among the 25 *Vibrio* cases, 13 cases were caused by *V. parahaemolyticus*, 6 were *V. vulnificus* and 6 were other various species of *Vibrio*. Types of infection included gastrointestinal (11), wound (8), and ear (3). The type of infection was not reported for three cases.



The 50 year and older age group had the highest incidence rate (0.6 per 100,000), and no cases were seen in less than 1 year olds. Incidence ranged from 0.2 to 0.3 cases per 100,000 population in the other age groups. The white population had a higher rate of infection (0.3 per 100,000) than the black population (0.1 per 100,000). Males had two-and-a-half times the incidence rate of females (0.5 and 0.2 per 100,000, respectively). The highest rate was reported from the eastern region (0.7 cases per 100,000 population). The incidence rates in the other regions ranged from 0.2 to 0.4 per 100,000. Sixty-four percent of cases occurred from July through September. One death due *Vibrio vulnificus* infection was reported during 2005.

## Cholera

No reported cases of cholera occurred in Virginia during 2005. The last case of cholera in Virginia occurred in 1994.

## **Viral Hemorrhagic Fever**

Agent(s): Multiple, including *Arenaviruses* (Argentinian, Bolivian, Venezuelan, and Brazilian hemorrhagic fevers, and Lassa fever), *Filoviruses* (Ebola and Marburg hemorrhagic fevers), *Bunyaviruses* (Crimean-Congo hemorrhagic fever [CCHF] and Rift Valley fever [RVF]), and *Flaviviruses* (Omsk hemorrhagic fever [OHF] and dengue hemorrhagic fever [DHF]).

Mode of Transmission: Vary by agent. *Arenaviruses* are carried by rodents and are contracted by breathing dust contaminated with saliva, feces and urine of infected rodents, but may also be transmitted person to person by infected patients. *Filovirus* hemorrhagic fevers are contracted through direct contact with blood or fluids from infected animals or persons. *Bunyaviruses* are typically transmitted by the bites of arthropods but may also be contracted through contact with the blood and body fluids of infected livestock or people. Hemorrhagic fevers caused by *Flaviviruses* are typically transmitted by the bites of arthropods. Among these, only DHF has been found to occur naturally in North America.

Signs/Symptoms: Vary by type, including, but not limited to; malaise, headache, fever, bleeding from nose and gums, rash, appearance of blood in the eyes, or vomiting. Case-fatality rates can range from 1% (Dengue) to 90% (Ebola).

Prevention: Depending on agent, exposure to hemorrhagic diseases can be reduced by rodent control around the home in endemic areas, by isolation of infected persons during their febrile period, by preventing contact with blood or body fluids of sick or dead animals, and by avoiding the bites of mosquito or tick vectors.

Other Important Information: Viral hemorrhagic fevers are classified as potential bio-weapons because they can cause high mortality and public panic and social disruption, and they require a great deal of planning to protect the public's health.

No cases of viral hemorrhagic fever have ever been reported in Virginia.

## **Yellow Fever**

Agent: Yellow fever virus

Mode of Transmission: Through the bite of several species of *Aedes* mosquitoes, most notably the yellow fever mosquito, which breeds in containers of water occurring around human habitations. The Asian tiger mosquito (*Ae. albopictus*), which is a common container breeder in Virginia, is also a competent yellow fever vector.

Signs/Symptoms: Varying levels of severity; include a sudden onset of fever, chills, headache, backache, generalized muscle pain, prostration, nausea, and vomiting. Jaundice is usually mild in early disease but intensifies later. Among cases with jaundice, fatality is 20% to 50%.

Prevention: Vaccinate against the yellow fever virus prior to visiting yellow fever endemic regions of the world.

No cases of yellow fever have been reported in Virginia since the nineteenth century.

## **Yersiniosis**

Agent: *Yersinia* species (bacteria)

Mode of Transmission: Ingestion of contaminated foods (raw or incompletely cooked pork products and unpasteurized milk), or contaminated surface or well water, or by direct or indirect contact with animals.

Signs/Symptoms: Vary depending on age, but may include fever, abdominal pain, bloody diarrhea.

Prevention: Safe food preparation and pasteurization of dairy products. People handling pork intestines should wash their hands and environmental surfaces thoroughly after contact and should not care for a young infant at the same time.

Other Important Information: Most infections occur during the winter.

Eighteen cases of yersiniosis were reported in Virginia during 2005. The largest proportion of cases was reported in infants (5 cases, 5.0 per 100,000). Data on race was missing for 56% of cases. Among cases with a reported race, five were from the black population and two were from the white population. Females and males had the same incidence rate (0.2 per 100,000). The southwest region reported the most cases and highest incidence rate (8 cases, 0.6 per 100,000). A predominance during the winter months was not noticed in Virginia during 2005.