

## Ehrlichiosis/Anaplasmosis

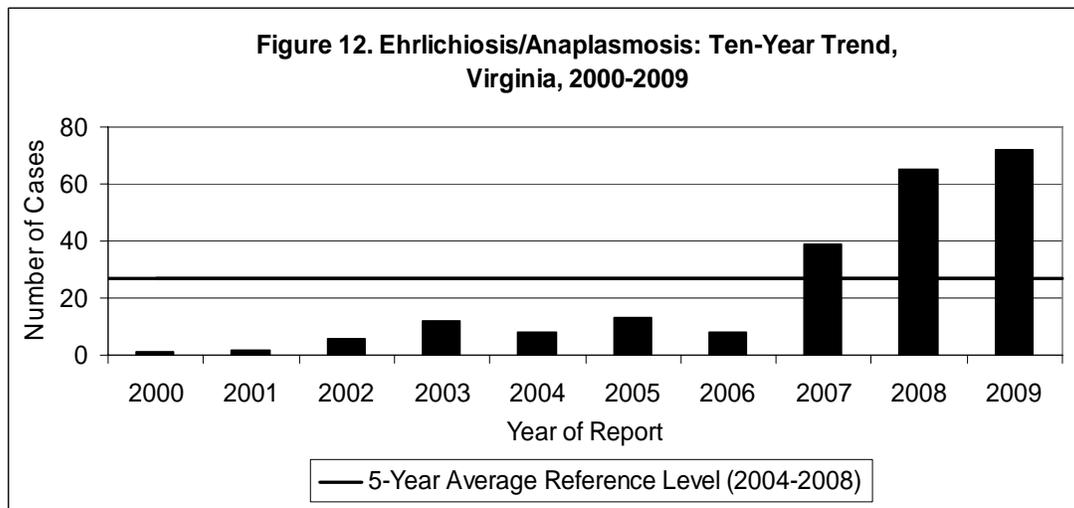
Agent(s): Bacteria belonging to the family *Anaplasmataceae*. *Ehrlichia chaffeensis* infects monocytes and causes an illness called human monocytic ehrlichiosis (HME). *E. ewingii* infects granulocytes and causes a disease referred to as an *E. ewingii* infection. *Anaplasma phagocytophilum* also infects granulocytes, causing an illness called human granulocytic anaplasmosis (HGA).

Mode of Transmission: Transmitted to humans through the bite of an infected tick. *Ehrlichia chaffeensis* and *E. ewingii* may infect adult or occasionally nymphal stage lone star ticks. *Anaplasma phagocytophilum* may infect nymphal stage blacklegged ticks, formerly known as deer ticks. Transmission of these pathogens occurs when an infected tick bites a person and feeds (i.e., remains attached) for a period of more than 24 hours.

Signs/Symptoms: Symptoms are usually non-specific, but commonly include fever, headache, nausea, anorexia, vomiting, and muscle pain. Blood work may be characterized by anemia, leukopenia, thrombocytopenia, or elevated hepatic transaminases. Untreated infections may result in prolonged fever, renal failure, respiratory distress, seizures, coma and death. Neurological symptoms due to inflammation of the brain and the lining around the brain and spinal cord develop in 20% of patients with HME, but are uncommon with HGA.

Prevention: Minimizing tick bites by avoiding likely tick habitats such as humid forest environments with dense undergrowth or heavy leaf litter, and tall weeds along forest margins, tree lines, forest trails and forest clearings. DEET, Picaridin, or Oil of Lemon Eucalyptus-based repellents should be applied to exposed areas of skin before entering tick habitats. When in tick-prone habitats, light-colored clothing should be worn with pants legs tucked into socks, and permethrin-based repellants should be applied to clothing, socks and shoes. After visiting tick habitats, body surfaces and pets should be thoroughly checked for ticks and, if found, attached ticks should be removed as soon as possible.

Seventy-two cases of ehrlichiosis/anaplasmosis were reported in Virginia during 2009. This is an 11% increase from the 65 cases seen in 2008 and a 171% increase from the five-year average of 26.6 cases per year (Figure 12). The reason for this considerable increase is unknown. It may be partially explained by changes in diagnosis and reporting,



and may be related to the growing deer populations, particularly in recently developed suburban areas where deer populations were previously maintained by hunting. Adult lone star ticks and blacklegged ticks both depend on deer blood for their reproduction and deer serve as a reservoir for *Ehrlichia chaffeensis*. Among cases reported in 2009, 68 were specified as HME, and four were specified as HGA.

In 2009, ehrlichiosis/anaplasmosis incidence was highest in the 60 year and older age group with 2.2 cases per 100,000. Incidence decreased with age, ranging from 1.5 per 100,000 in the 50-59 year age group to 0.1 per 100,000 in the 1-9 year age group. No cases were reported from the less than one year age group. This is similar to the age pattern for ehrlichiosis/anaplasmosis observed in other endemic areas of the United States, where infections occur predominantly among those over the age of 50 years. Incidence in the white population was more than twice that in the black population (0.7 and 0.3 per 100,000, respectively). The rate in males was almost double the rate in females (1.2 and 0.7 per 100,000, respectively).

Cases were reported from all regions of the state. The northwest region had the highest incidence of ehrlichiosis/anaplasmosis, at 2.1 cases per 100,000, followed by the southwest region at 1.4 per 100,000. Rates in the remaining regions of the state ranged from 0.1 to 1.3 per 100,000, respectively. The vast majority of cases (93.1%) had onsets in the second and third quarters, which represents the time of year when ticks are most actively feeding.