Ehrlichiosis/Anaplasmosis

Agent(s): Bacteria belonging to the family *Anaplasmataceae*. *Ehrlichia chaffeensis* infects monocytes (a type of white blood cell involved with immune function) and causes an illness called human monocytic ehrlichiosis (HME). *E. ewingii* infects granulocytes (a different category of white blood cells) and causes a disease referred to as an *E. ewingii* infection. *Anaplasma phagocytophilum* also infects granulocytes, causing an illness called human granulocytic anaplasmosis (HGA).

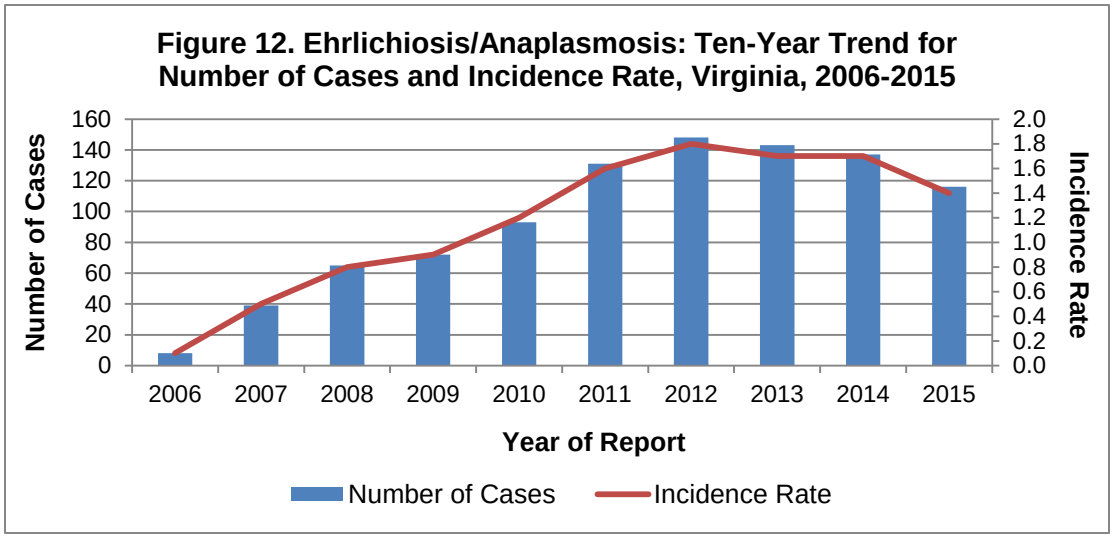
Mode of Transmission: Transmitted to humans through the bite of an infected tick. *E. chaffeensis* and *E. ewingii* may infect adult and nymph stage lone star ticks and be transmitted by them. *Anaplasma phagocytophilum* may infect nymph stage and adult blacklegged ticks (deer ticks) and is primarily transmitted by the nymph stage ticks. Transmission of these pathogens occurs when an infected tick bites a person and feeds on that person and remains attached for more than 24 hours.

Signs/Symptoms: Illness symptoms commonly include the sudden onset of fever, accompanied by one or more of the following symptoms: headache, body aches, nausea, vomiting and rash. In cases of ehrlichiosis, a rash may occur in up to 30% of adults and 60% of children; rashes are rare in cases of anaplasmosis. Patients may exhibit signs of thrombocytopenia (low blood platelet count) and leucopenia (low white blood cell count) and have elevated liver function test results. Severe forms of illness can result in meningitis/encephalitis, bleeding disorders, difficulty breathing, organ damage and death. Persons with weakened immune systems are prone to develop more severe disease. Persons who do not have a spleen have a high risk of death.

Prevention: Common practice should include minimizing tick bites by recognizing and avoiding the habitats of lone star ticks and blacklegged ticks. These habitats include humid forest environments with undergrowth or heavy leaf litter, and tall weeds and vegetative ground cover along shady forest margins, tree lines, forest trails and forest clearings. Repellents containing DEET, Picaridin, BioUD, IR3535, or oil of lemon eucalyptus are effective against ticks and 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. Permethrin-based repellents should be applied to clothing, socks and shoes. After visiting tick habitats, a person should remove and wash clothing, thoroughly check all body surfaces for ticks and, if found, carefully remove attached ticks as soon as possible.

Other Important Information: Due to the many difficulties associated with diagnosis and testing of tick-borne diseases, cases of ehrlichiosis or anaplasmosis may be misdiagnosed as Rocky Mountain spotted fever (RMSF). However, based on tick infection surveys, ehrlichiosis is thought to be much more common than RMSF in Virginia.

Ehrlichiosis/Anaplasmosis: 2015 Data Summary	
Number of Cases:	116
5-Year Average Number of Cases:	130.4
% Change from 5-Year Average:	-11%
Incidence Rate per 100,000:	1.4



In 2015, 116 cases of ehrlichiosis/anaplasmosis were reported in Virginia. This represents a decrease from the 137 cases reported in 2014 and also represents an 11% decrease from the five-year average of 130.4 cases per year (Figure 12). The decline in reported cases over the past three years can partially be attributed to fewer cases of ehrlichiosis. The decrease in ehrlichiosis cases can further be explained by the recent unusually cold winters in Virginia and the subsequent effect on the lone star tick population, the natural carriers of the bacteria causing ehrlichiosis. Lone star ticks are normally found in the warmer southeast areas of the U.S., and are less tolerant of colder conditions. In contrast, the northern blacklegged tick is the natural carrier of the bacteria causing anaplasmosis in Virginia. This tick species migrated from the north and is resistant to cold weather, and therefore, the lower temperatures have had less impact on the blacklegged tick population and the number of anaplasmosis cases. Among ehrlichiosis/anaplasmosis cases reported in 2015, 96 (83%) were specified as HME, 10 (9%) were specified as HGA, and 10 (9%) were ehrlichiosis/anaplasmosis unspecified.

In 2015, ehrlichiosis/anaplasmosis incidence rates were highest in the 60 year and older age group, with 3.3 cases per 100,000, followed by the 50-59 year age group, with 2.0 cases per 100,000. Together, these two age groups accounted for 67% of all cases. The younger age groups had the lowest incidence rates. This predominance of illnesses among those over the age of 50 years is typical of what is observed for ehrlichiosis and anaplasmosis in other endemic areas in the U.S. Race was not reported for 50% of cases. Among patients of known race, incidence in the white population (0.9 per 100,000) was higher than the rate in the black and "other" race populations (0.2 per 100,000 each). Incidence was higher among males than females (1.6 and 1.2 per 100,000, respectively).

Cases were reported from all regions of the state. The highest incidence rate (3.0 per 100,000) was observed in the southwest region followed by the northwest region (2.7 per 100,000). Rates in the remaining three regions ranged from 0.6 to 0.9 per 100,000. While the incidence rate for the southwest region was highest among all regions, the map below shows reported cases occurred mostly along the eastern part of that region, and far fewer cases were reported from the far southwest. Likewise, for the northwest region,

reported cases occurred in localities located along the eastern edge of the region, and not from localities located along the western edge. In the eastern region of the state, the incidence rate was higher on the Eastern Shore than in any other locality in that region. The largest proportion of cases (59%) had symptom onset in the second quarter of the year, while 33% had symptom onset in the third quarter. The second and third quarters represent the spring and summer months, when ticks are most likely to feed.

Ehrlichiosis / Anaplasmosis Incidence Rate by Locality
Virginia, 2015