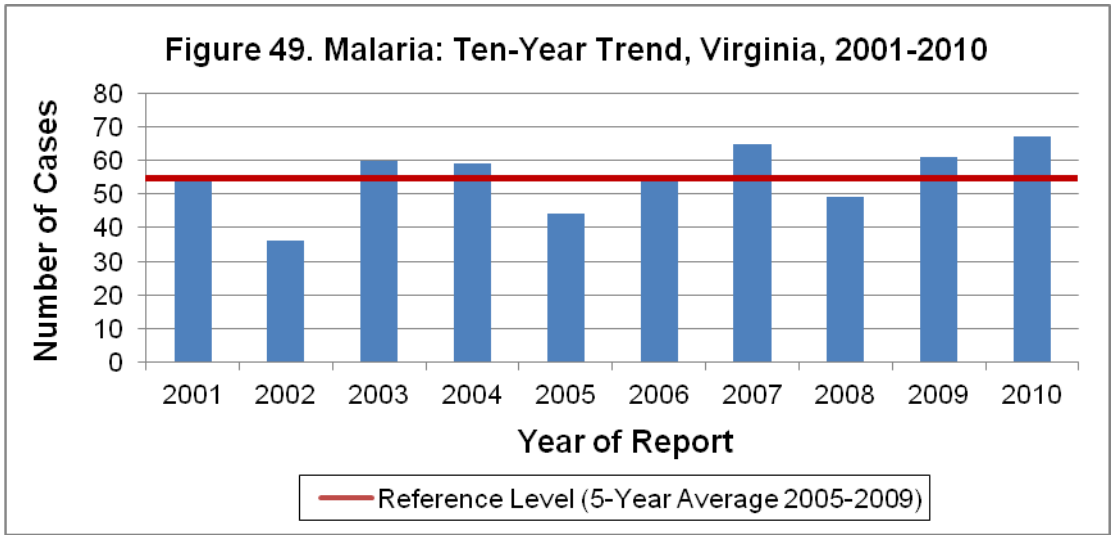
Malaria

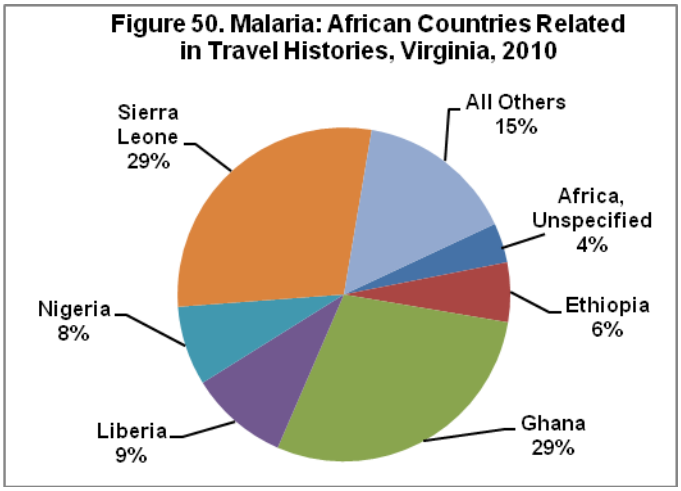
Agent(s): Four different species of protozoan parasites: *Plasmodium falciparum, P. vivax, P. ovale,* and *P. malariae*
Mode of Transmission: Transmission through the bite of an infected female *Anopheles* mosquito. Transmission might also occur from infected mother to child during pregnancy or delivery, by blood product transfusion or through transplanted organs from infected donors. Humans and certain *Anopheles* mosquito species are the only natural reservoirs for malaria.
Signs/Symptoms: Typically, high fevers, 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 (i.e., cerebral malaria), severe anemia, jaundice, renal failure and coma.
Prevention: Appropriate medication for malaria prophylaxis should be taken by travelers when traveling to malaria-endemic countries. Anopheline mosquitoes bite only at dusk, dawn or during night-time hours and tend to enter buildings. Control measures include staying in structures with adequate screening and equipped with bed nets, and when outdoors, wearing long-sleeved, loose fitting, light-colored clothing and mosquito repellents.
Other Important Information: Almost all infections reported in Virginia occur in persons who were infected in other countries. Although malaria is not endemic to Virginia, it may be brought to this region by travelers or immigrants with dormant or inapparent infections. Malaria might also arrive in Virginia by infected mosquitoes transported in aircraft or ships arriving from foreign destinations. There are two potential mosquito vectors for malaria in Virginia: *Anopheles quadrimaculatus* and *An. punctipennis*.

During 2010, 67 cases of malaria were reported in Virginia. This is a 10% increase from the 61 cases reported in 2009, and a 22% increase from the five-year average of 54.8 cases per year (Figure 49).



Incidence rates were highest in the 40-49 and 30-39 year age groups (1.5 and 1.3 per 100,000, respectively). Race was reported as unknown for 30 cases (45%). Where race was reported, the highest number of cases (29 cases, 1.8 per 100,000) occurred in the black population. This was notably higher than what was reported for the "other" race category (3 cases, 0.5 per 100,000) and the white population (5 cases, 0.1 per 100,000). Incidence in males was higher than the rate among females (1.0 and 0.7 per 100,000, respectively). The majority of cases (47 cases, 70%) were reported from the northern region. Other regions reported between 1 and 9 cases each. Cases occurred throughout the year, with the largest proportion (21 cases, 31%) occurring during the second quarter. However, because cases of malaria are usually acquired outside the United States, observed seasonality patterns are likely to be related to travel patterns to endemic countries.

All cases reported a history of travel outside of the United States within the four years prior to disease onset. A majority (52 cases, 78%) occurred in persons who had previously visited countries on the African continent. Other countries mentioned in travel history included India (11 cases), Pakistan (2 cases), Peru (1 case) and Haiti (1 case). The African countries most frequently referenced in the travel histories include Ghana (15 cases), Sierra Leone (15 cases), Liberia (5 cases), and Nigeria (4 cases) (Figure 50).



Information on malaria prophylaxis usage was obtained for 62 (93%) of the reported cases. Of these, 17 (27%) reported receiving prophylaxis for malaria, although 10 of the 17 cases reported missing at least one dose. One death due to malaria was reported in 2010 in a male from the northern region older than 60 years. The organism was identified as *P. vivax* and there was no record of malaria prophylaxis for this patient.