

## **Malaria**

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

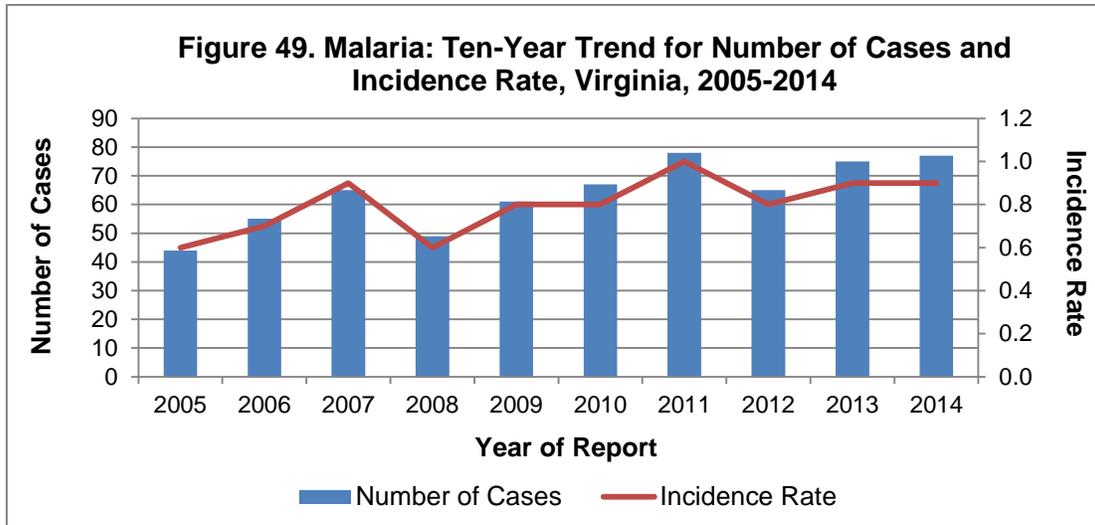
**Signs/Symptoms:** Typically, high fevers, chills, sweats, severe headache, muscle and joint pain, anorexia, nausea, flu-like illness, anemia and an enlarged spleen. *P. falciparum* infections may progress to severe malaria if not treated promptly; symptoms include acute alteration of brain structure 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 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 with infected mosquitoes transported in aircraft or ships arriving from foreign destinations. Two potential mosquito vectors for malaria are present in Virginia: *Anopheles quadrimaculatus* and *An. punctipennis*.

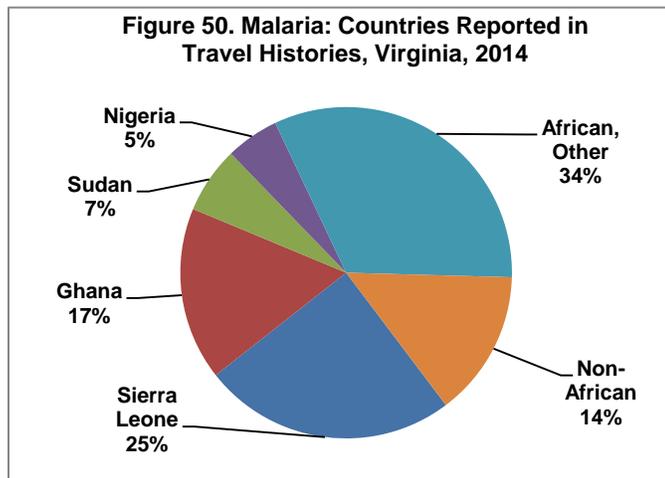
<b>Malaria: 2014 Data Summary</b>	
Number of Cases:	77
5-Year Average Number of Cases:	69.2
% Change from 5-Year Average:	+11%
Incidence Rate per 100,000:	0.9

In 2014, 77 cases of malaria were reported in Virginia. This represents a slight increase from the 75 cases reported in 2013, and an 11% increase from the five-year average of 69.2 cases per year (Figure 49). Incidence rates were highest in the 20-29 year age group (1.4 per 100,000), followed by the 30-39 year age group (1.2 per 100,000). Incidence among the remaining age groups ranged from 0.4 to 1.0 per 100,000, with no cases occurring in infants. Race was not reported for 29% of cases. For cases with a known race, the incidence rate in the black population (2.5 per 100,000) was substantially higher than rates for the “other” race population (0.5 per 100,000) and the white population (0.2 per 100,000). Males had a higher incidence rate than females (1.2 and 0.6 per 100,000, respectively).



The majority of cases (74%) and highest incidence rate (2.4 per 100,000) were reported from the northern region. This is noticeably higher than the statewide rate of 0.9 per 100,000. Incidence by locality can be viewed in the map below. Cases occurred throughout the year. Malaria is almost always acquired outside the U.S.; therefore, any observed temporal patterns are related to patterns of travel to endemic countries.

All cases reported a history of travel outside of the U.S. within the two years prior to disease onset. The majority of those with travel outside the U.S. (88%) had visited countries on the African continent. The African countries most frequently referenced included Sierra Leone (19 cases), Ghana (13 cases), Sudan (5 cases) and Nigeria (4 cases) (Figure 50). Non-African countries most frequently mentioned in travel histories included India (3 cases), Pakistan (3 cases), and Honduras (2 cases).



The parasitic species of *Plasmodium* were identified in 70 individuals diagnosed with malaria in 2014. Specifically, 70% were infected with *P. falciparum*, 13% *P. vivax*, 3% *P. malariae*, and 3% *P. ovale*. One case was infected with two species, *P. vivax* and *P. ovale*. Species could not be determined for the remaining 7 cases.

Information on malaria prophylaxis usage was obtained for 66 of the cases. Of these, only 27% (21 individuals) reported receiving prophylaxis for malaria, and 8 of the 21 individuals reported missing at least one dose. No deaths were known to be due to malaria in Virginia in 2014.

# Malaria Incidence Rate by Locality Virginia, 2014

