GUYANA

Most cases occur in the interior of the country in the Amazon rainforest area, with rates being particularly high in the areas bordering the Venezuelan and Brazilian border (Figure 1). In 2014, Guyana reported 12,353 cases of malaria and 11 deaths (Figure 2). Morbidity has decreased by 48.6% from 2000 and mortality decreased by 62.1%. Despite these achievements, the WHA 58.2 target for MDG 6C has yet to be achieved.

Figure 2. Number of cases and deaths due to malaria in Guyana, 2000-2014

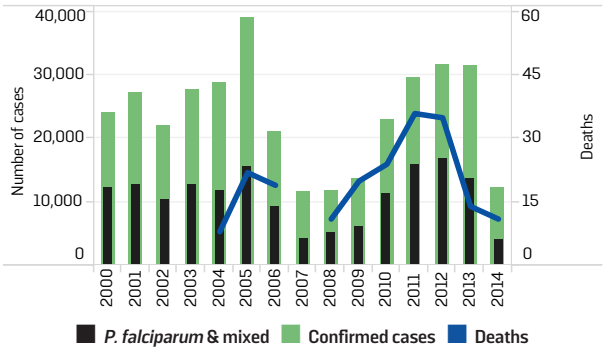
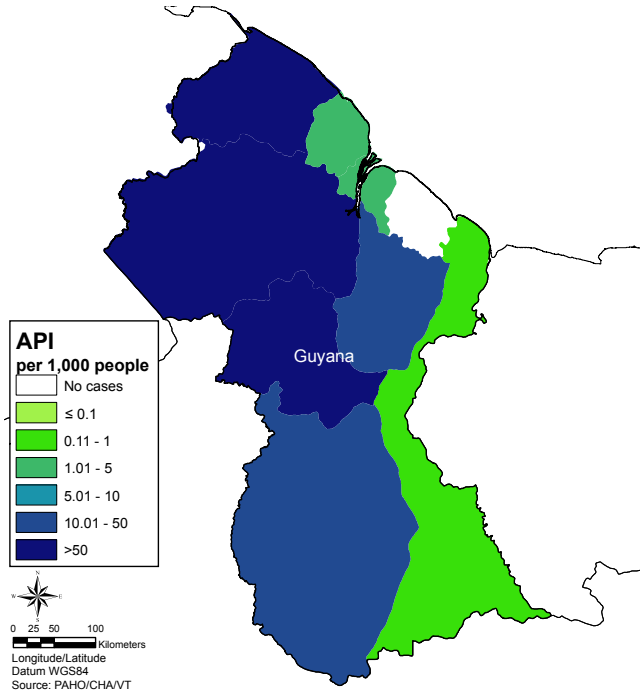


Figure 1. Malaria by Annual Parasite Index (API) at region level (ADM1), Guyana 2014



Similar to other parts of the Guiana Shield, malaria has been highly prevalent in gold miners who are often working in unregistered mines or are from foreign countries. These miners often have limited access to health care due to remoteness of the places they work in. Between 2013 and 2014 Guyana had a 60.8% decrease of confirmed cases which may be attributable to the decrease in gold prices and subsequent decrease in the number of miners in the country. The API rates in the interior areas are also artificially high; the population at risk is higher than the reported people living in a city or area as it is difficult to estimate the exact population of miners in that area. Another factor to take into consideration is the noted underreporting of cases. In 2013, only 61% of expected reports from public health institutions were received, which decreased to 57.8% in 2014.

An. darlingi is the primary malaria vector found in Guyana. In 2014, *P. vivax* caused 58.1% of all cases, though *P. falciparum* also causes a significant amount of cases every year. *P. malariae* is also present in the country, though it accounted for <1% of all cases since 2008.

Figure 3. Districts with the highest number of malaria cases in Guyana, 2012-2014

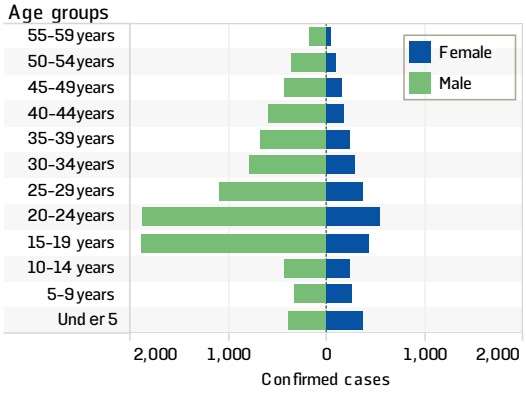
District	Region	2012	2013	2014
Barima/Amakura	Region 1	4,188	6,412	3,582
Mazaruni/Left Bank Essequibo R.	Region 7	6,996	5,063	1,756
Cuyuni	Region 7	4,767	3,659	1,613
Lower Potaro/Ladysmith Creek	Region 8	7,265	5,592	1,312
Waini	Region 1	1,885	2,558	805
Rewa/Upper Essequibo*	Region 9	17	20	668
Right Bank Essequibo**	Region 10	1,431	1,648	601
Ireng/Upper Potaro	Region 8	1,031	1,277	540
Bonasika/Boerasirie	Region 3	29	9	140
Somerset and Berks/Supenaam R.	Region 2	17	11	118

Decrease Increase

0 8,000 0 8,000 0 8,000

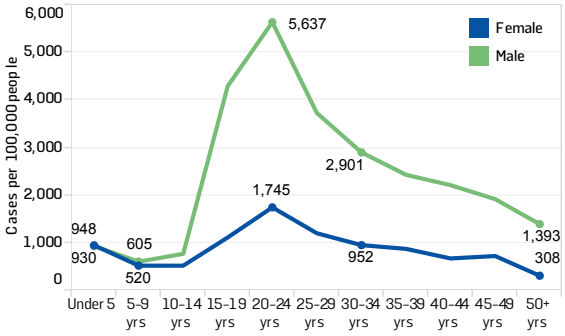
*Rewa (Illiwa)/Upper Essequibo (Rupununi East)
**Right Bank Essequibo/Upper Demerara

Figure 4. Malaria cases by age and sex in Guyana, 2014



Generally, men are more affected than women, especially in the early adult years between the ages of 15-24 (Figures 4 and 5). In 2014, approximately 68% of malaria cases occurred in men, which resulted in a malaria incidence of 2,324 cases per 100,000 people. Comparatively, women had a much lower malaria incidence of 813 cases per 100,000 people. As mentioned previously, occupational activity is a risk factor for men.

Figure 5. Malaria incidence by age and sex in Guyana, 2014



Priority Groups

Indigenous and ethnic groups, also known as Amerindians in Guyana, have a high risk of malaria in Guyana. More than 4,500 cases were reported among Amerindians in 2014, accounting for 37% of total cases. The incidence of Amerindians (6,052 cases per 100,000 people) is 5-fold higher than the rest of the population (1,152 cases per 100,000 people). The highlands in the interior of the country are where the indigenous populations abound. Malaria is prevalent here albeit at a lower rate than that in mining areas. The prime reason for continued malaria transmission among them has been limited access to healthcare and unprotected housing.

Figure 6. Blood slides examined and SPR in Guyana, 2000-2014

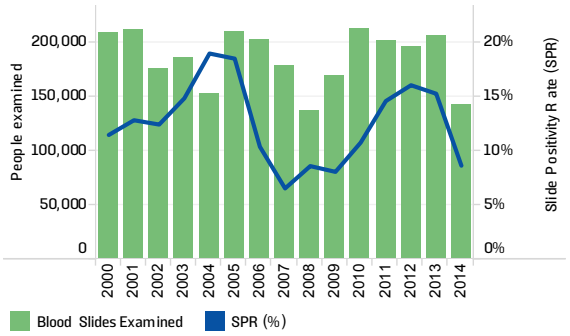
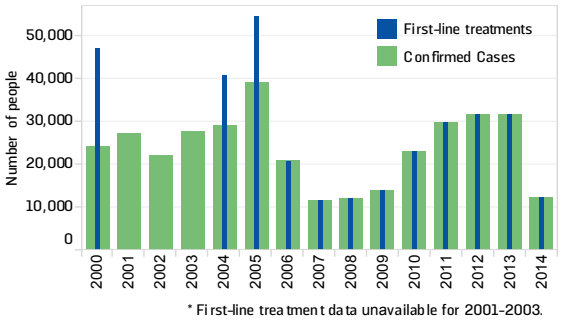


Figure 7. Number of malaria cases and those treated with first-line treatment in Guyana, 2000-2014



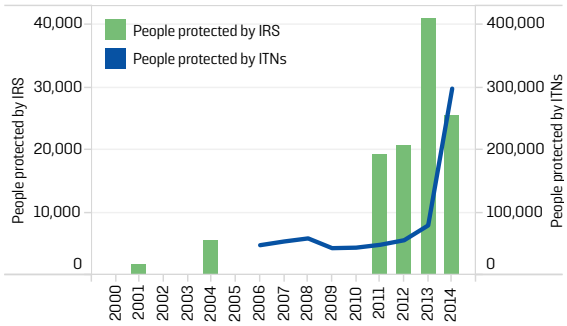
Malaria in pregnancy rates are the highest in the Americas and have consistently been higher than that in non-pregnant women of child-bearing age. In 2014, the incidence rate (1,321 cases per 100,000 pregnant women) decreased from that of 2013 (2,756 cases per 100,000 pregnant women).

Diagnosis and Treatment

Microscopy is the primary method used to determine malaria infection (Figure 6). The SPR decreased in 2014, however, as have the overall number of cases. The number of people examined for malaria through active surveillance has decreased from around 59% of all slides examined per year in 2007 to 26% in 2014; however, this has been primarily due to the increase the number of people being examined through passive case surveillance (73,000 to 105,000). The proportion of confirmed cases being detected through active surveillance in 2014 (5.7%) has remained similar to that in 2013 (5.6%)

Though all confirmed cases were reported to have received first-line treatment (Figure 7), self-treatment is common in Guyana and may be a contributing factor

Figure 8. People protected by IRS and by ITNs in Guyana, 2000-2014



***IRS data unavailable for 2000, 2002, 2003, 2005-2010. ITN data unavailable 2000-2005.**

to artemisinin resistance. Current studies are underway to research possible K13 gene mutations in Guyana, French Guiana, and Suriname. Unpublished data have indicated that there is no reduction in artemisinin sensitivity in Guyana. At this time, first-line treatment for *P. falciparum* remains the artemisinin combination treatment of artemeter-lumefantrine. Chloroquine with primaquine is used as the first-line of treatment for *P. vivax* infections.

Vector Control

Indoor residual spray and ITNs are both utilized methods of vector control. Approximately 300,000 people were protected by ITNs in 2014, which is the highest estimate to date (Figure 8). IRS use is also high, though the amount of people protected decreased from 2013 to 2014. Use of IRS in mining sites remains a challenge as houses and living areas have no walls. Insecticide susceptibility studies have not been reported.

Funding

Government funds are the biggest source of malaria resources and amounted to about US$850,000 in 2014 (Figure 9). The Global Fund has provided support since 2005 and, along with Suriname, Guyana is one of only a few countries in the Guiana Shield to be eligible for Global Fund resources. The AMI/RAVREDA project funded by USAID has also supported the country particularly in surveillance network for antimalarial resistance initiatives. This project has continually provided funding since its establishment in 2002.

Figure 9. Funding for malaria in Guyana, 2000-2014