

Overview of the situation

Figures 1-5

Historically, malaria has been a major public health problem for Guyana, as it has for other countries of the Americas. Nevertheless, the number of cases reported in Guyana is much lower than in countries such as Brazil, Colombia, Peru, and Venezuela. API in the country has declined from 52 per 1,000 inhabitants in 2005, to 28 per 1,000 in 2006, and 15 per 1,000 in 2007 and 2008.

The most important vector of malaria in the interior of Guyana is the *Anopheles darlingi* mosquito, whereas the species *A. aquasalis* is a secondary and poor vector of malaria transmission on the coastland.

Malaria transmission in Guyana is focalized and endemic, mainly in the gold mining and logging areas of the interior in parts of regions 1 and 2, regions 7, 8, and 9, and part of region 10. Malaria by *Plasmodium falciparum* has been reestablished in areas where it was previously under control or had been eradicated; transmission by this type predominates in highly mobile populations with little or no immunity.

In 2008, there were 11,815 new cases in Guyana (41 imported), of which 5,252 were *P. falciparum* malaria. Region 7 (Cuyuni-Mazaruni) reported 5,190 cases, or 44% of the total number of cases of malaria in the country. This region

also has the largest population movements due to mining activities. Both the geographical clustering of cases and the limited access to health services in areas dominated by mining and logging pose major difficulties for malaria control.

Morbidity and mortality trends

Figures 4 – 9

In 2005, there was a major peak in malaria incidence in Guyana, with 38,984 cases reported. The number of cases subsequently decreased and then stabilized in 2007 and 2008. In 2008, the number of cases of *P. falciparum* malaria increased slightly compared to 2007. In 2006 and 2007, malaria transmission decreased significantly in regions 1, 8, and 9, but remained the same in 2008.

The decrease in the number of cases was accompanied by a reduction in mortality. In 2008, Guyana reported only one malaria-related death.

Geographic Distribution

Figures 1, 12-19

In 2008, the District of Mazaruni in the west of the country, reported 3,016 new cases, 25.5% of the total number of cases in the country. The districts of Cuyuni and Potaro reported 2,113 and 2,175 new cases, respectively. Together these three mining and logging districts accounted for 61.8% of new cases in the country, which re-

presents a pointed focalization of the problem. Within each district, however, malaria cases are distributed among a large number of localities, making it difficult to control.

The georeferencing of malarious localities in Guyana provides visual confirmation of the fact that, in 2008, 352 localities were reported as a source of cases but of these, 206 reported less than 5 cases each. Only 32 districts registered more than 50 cases in the year and only six localities had more than 250 cases.

In Region 8, the town of Mahdia recorded 983 new cases in 2008, the highest number of cases in the country. The towns of Konawaruk in Region 8, Omai in Region 7 and Mabura Hill in Region 10 constitute a major focus of transmission at the confluence of these three regions, close to the center of the country. These are gold mining and logging areas, where about 54% of the cases were *P. falciparum* malaria, affecting mostly an Afro-Guyanese population.

Malaria in specific populations

Figures 25–28

In 2008, Guyana reported 517 cases of malaria in children under 5 years of age, or 4.3% of the total number of malaria cases in the country. Along with Costa Rica, Guyana is the country with the lowest proportion of cases in this age group, which might be explained by the fact that malaria is mostly endemic in mining areas. In 2008, 81% of total cases were reported in people between 15 and 49 years of age and, of those, 80% were among males.

In Guyana, the Amerindian population is significantly affected by malaria. In 2008, 34% of the total number of cases reported occurred in this ethnic group, much higher than in other

countries.

In the districts of Rupununi West, Region 9, Ireng/Upper Potaro, Region 8 and Moruka/Pomeroon, Region 2 the proportion of cases among Amerindians was 86%, 79% and 69%, respectively. Among persons infected with malaria in Region 9, in the south of the country, Amerindians were the most affected. Also, the region had higher incidence rates of the disease than the rest of the country.

Pregnant women accounted for 9% of malaria cases among all women between 15 and 45 years of age with malaria in 2008. This proportion was similar to that observed in Brazil, but higher than other countries, like Bolivia and Colombia. This may reflect better recordkeeping of malaria during pregnancy than exists in other countries.

Diagnosis and treatment

Figures 20–24, 29–30

As in the rest of the Amazon region, *P. falciparum* strains in Guyana are resistant to chloroquine and sulfadoxine-pyrimethamine treatment. In 2004, Guyana changed its malaria treatment policy, and introduced the use of ACTs as a first line of treatment for uncomplicated *P. falciparum* malaria.

In 2004, 2,580 artemether + lumefantrine treatments were distributed. In 2005, 17,727 ACT treatments were distributed and more than 10,000 treatments were distributed in 2006. This can partly be explained by the fact that both *P. vivax* and *P. falciparum* malaria rose sharply during 2005, as it did in Brazil and many other countries in the region.

By the end of 2006, the number of cases had fallen significantly. The Malaria Control

Program has continued to use the arthemether + lumefantrine combination as a first line of treatment. Two evaluations of therapeutic efficacy have been conducted.

The slide positivity rate in 2008 was 8.6%, a proportion similar to that of other countries in the region, and lower than that of Brazil and Colombia. This positivity rate is lower than the annual average for the decade, but is slightly higher than the 2007 rate. In 2008, the number of blood slides examined was lower than in 2007, while the number of cases remained relatively stable. This may highlight the need for enhanced microscopy for the early detection of cases.

Guyana's information system does not record the time span between the onset of symptoms and diagnosis. However, it is noteworthy that many of the cases that were part of the outbreaks in Regions 7 and 8 in 2008 were diagnosed in the capital city of Georgetown. In 2008, 2,143 of the 5,190 cases reported in Region 7 (41%) were diagnosed and treated in the capital.

In 2008, the use of rapid diagnostic tests for malaria was not reported.

Populations in mining areas can readily access medicines that are not recommended by the Ministry of Health. This presents a problem for the malaria treatment policy in Guyana. The indiscriminate use of these drugs to suppress clinical symptoms makes it difficult to detect cases and contribute to widespread resistance.

Prevention and vector control

Figures 31-33

The use of long-lasting insecticide impregnated nets (LLINs) started in Guyana in 2006, with the distribution of 29,577 nets purchased by the government with financial support from the Global Fund, and Amazon Malaria Initiative (AMI) projects. Currently, LLINs are the primary intervention for malaria vector control in Guyana. The policy dictates the distribution of two LLINs per household, and the development of joint intervention that includes LLIN distribution and access to treatment with ACT.

The AMI project also provided support for the distribution of mosquito nets, of which 5,813 LLINs were distributed in 2007 and 4,287 LLINs were distributed in 2008. Distribution focused on vulnerable groups, such as pregnant women, children under the age of 5 years, and miners and loggers in Regions 1, 7, 8, 9 and 10. In 2008, no indoor residual spraying took place.

Financing of malaria control

Figure 34

Since 2005, Guyana became a beneficiary of a Global Fund project for malaria control, which in recent years has supported the intensification of control activities in priority regions. The European Union and the AMI project, financed by the USAID and coordinated by the PAHO, have provided funding for technical cooperation to control malaria. In 2008, approximately half of the funding for control measures was provided by external sources.

Figure 1. Number of cases by locality, 2008

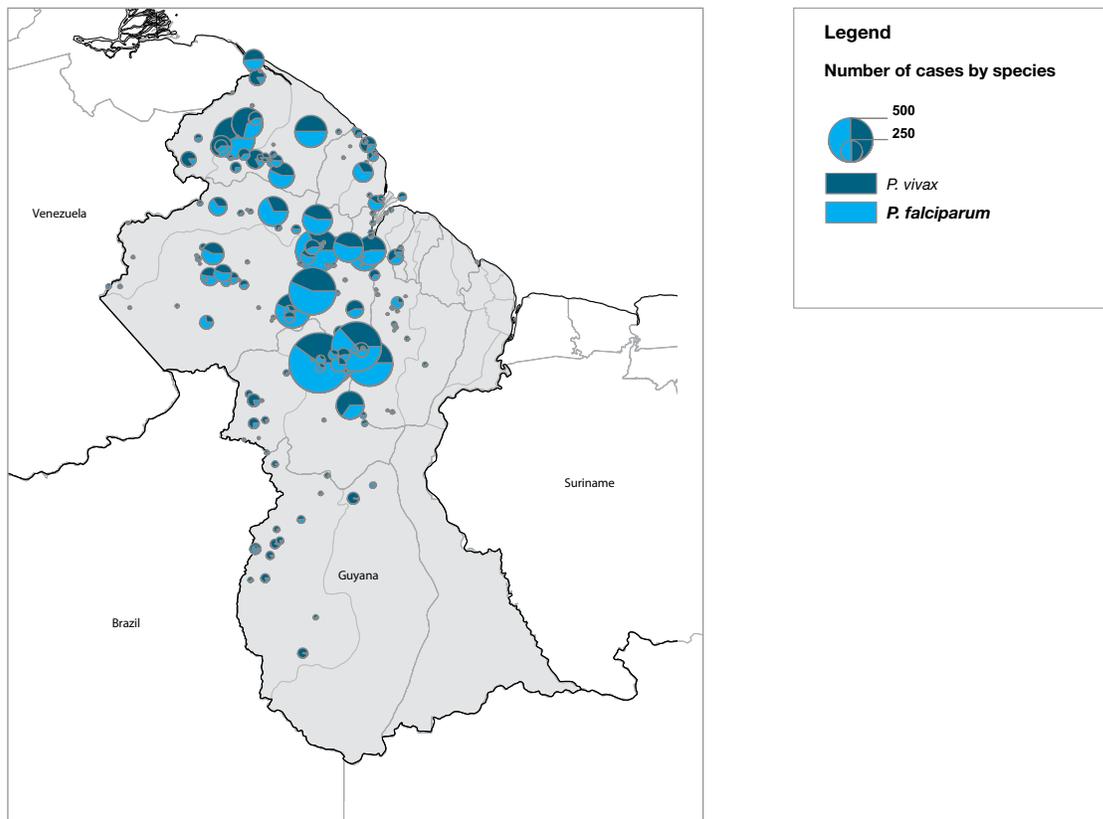
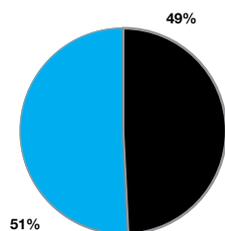


Figure 2. Proportion of cases by species, 2008



Plasmodium species
 ■ *P. vivax*
 ■ *P. falciparum* and mixed

Figure 3. Number of malaria cases by species by ADM1 level in 2008

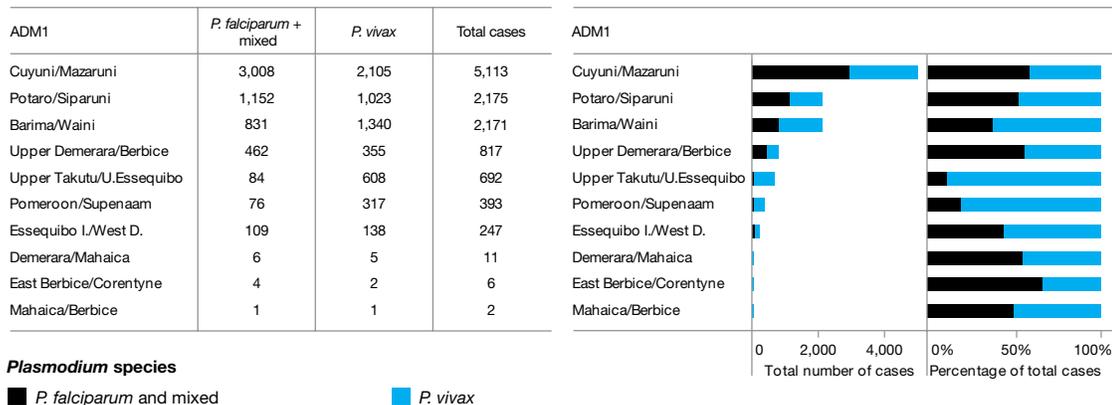


Figure 4. Number of cases by species, 2000-2008

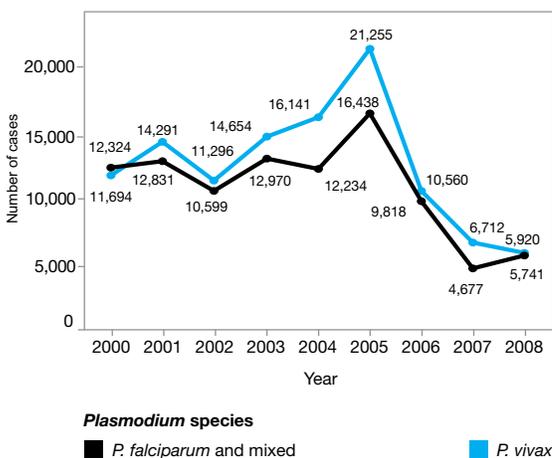


Figure 5. Number of malaria cases, 2000-2008

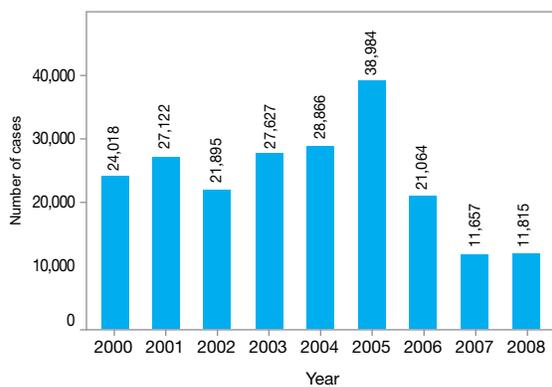


Figure 6. Number of malaria deaths, 2000-2008

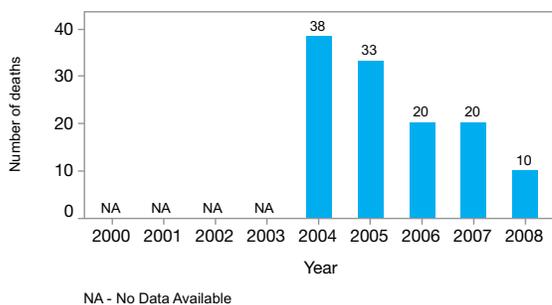


Figure 7. Number of hospitalized malaria cases, 2000 - 2008

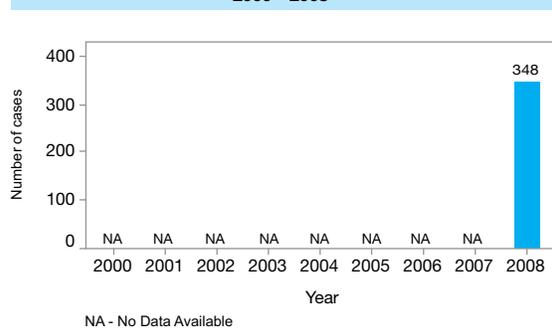
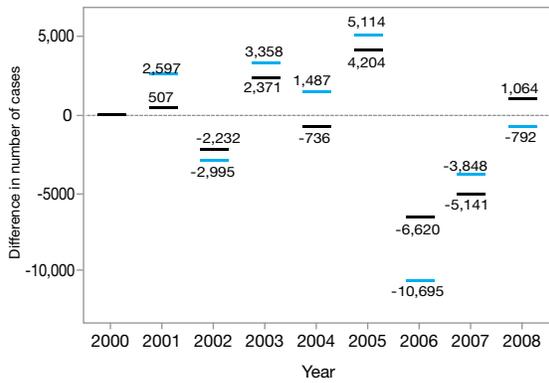


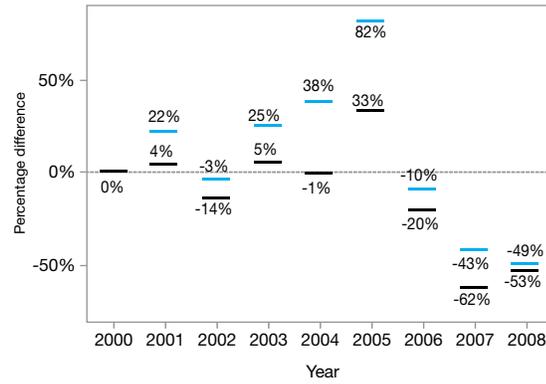
Figure 8. Annual variations in number of cases



Plasmodium species

■ *P. falciparum* and mixed ■ *P. vivax*

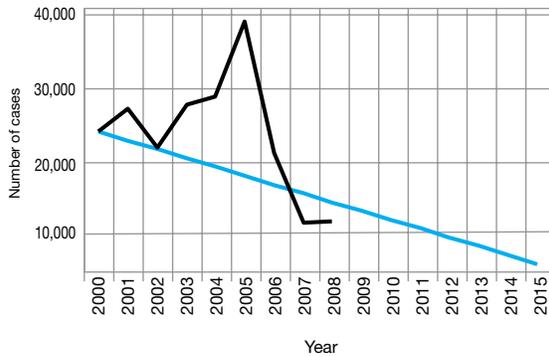
Figure 9. Percentage difference in number of cases compared to 2000



Plasmodium species

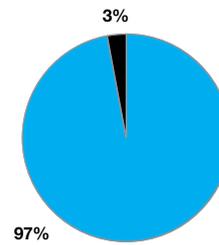
■ *P. falciparum* and mixed ■ *P. vivax*

Figure 10. Number of cases and RBM / MDG targets for 2010 and 2015



■ Reported cases ■ RBM / MDG Targets

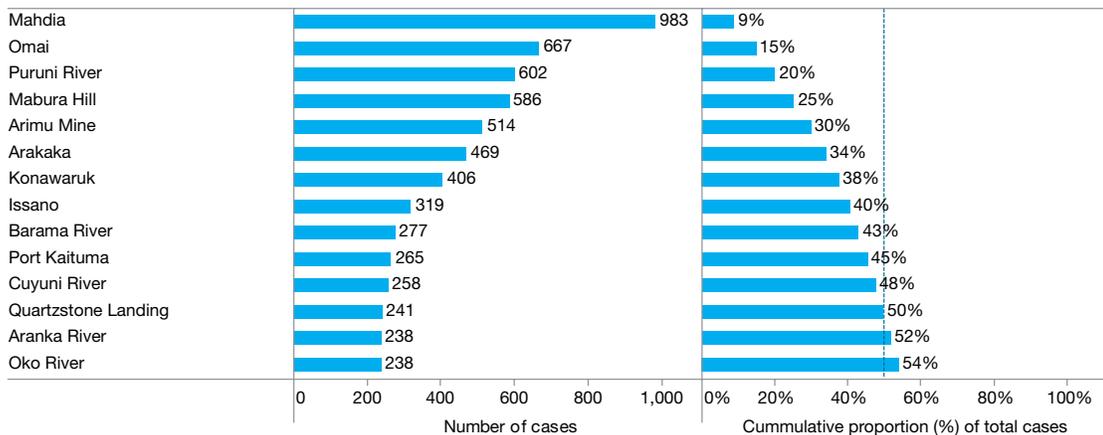
Figure 11. Percentage of hospitalized cases, 2008



Percentage of cases

■ Outpatients ■ Hospitalized

Figure 12. Localities (ADM2) with highest malaria burden and cumulative proportion of total cases in the country, 2008



* See Annex A for a complete list.

Figure 13. Localities by number of malaria cases, 2008

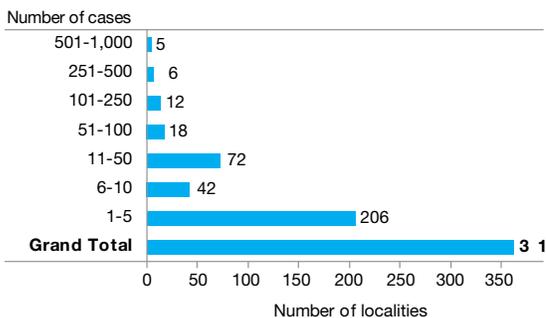


Figure 14. Localities by number of *P. falciparum* cases, 2008

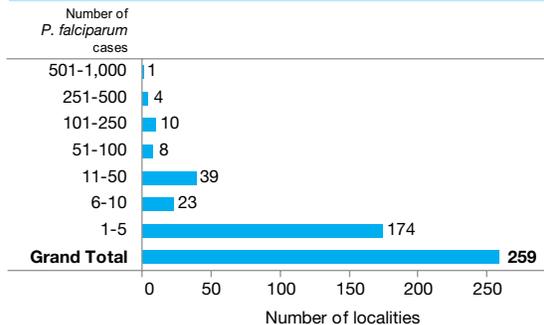


Figure 15. Regions (ADM1) by number of cases, API and percentage of *P. falciparum* cases, 2008

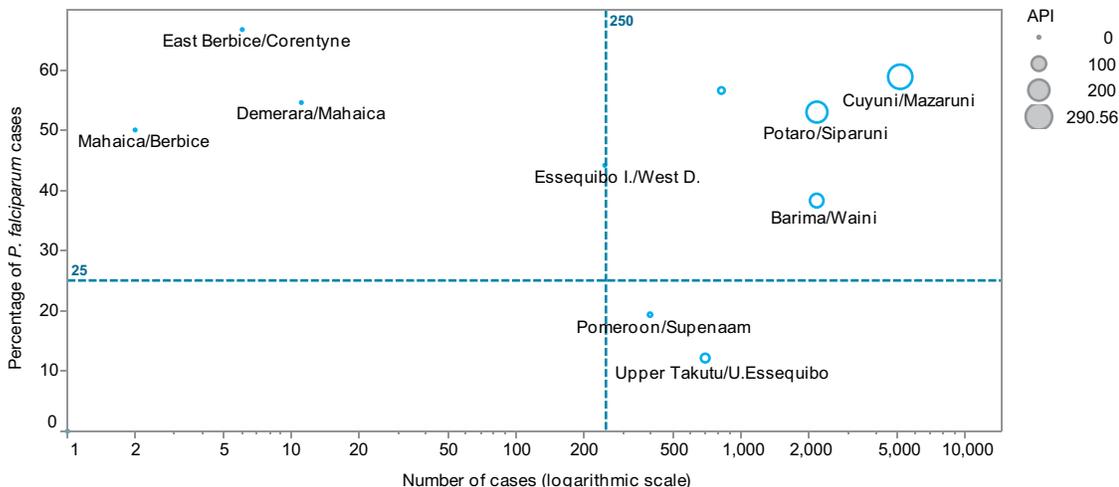


Figure 16. Annual Parasite Index (API) by districts (ADM2), 2008

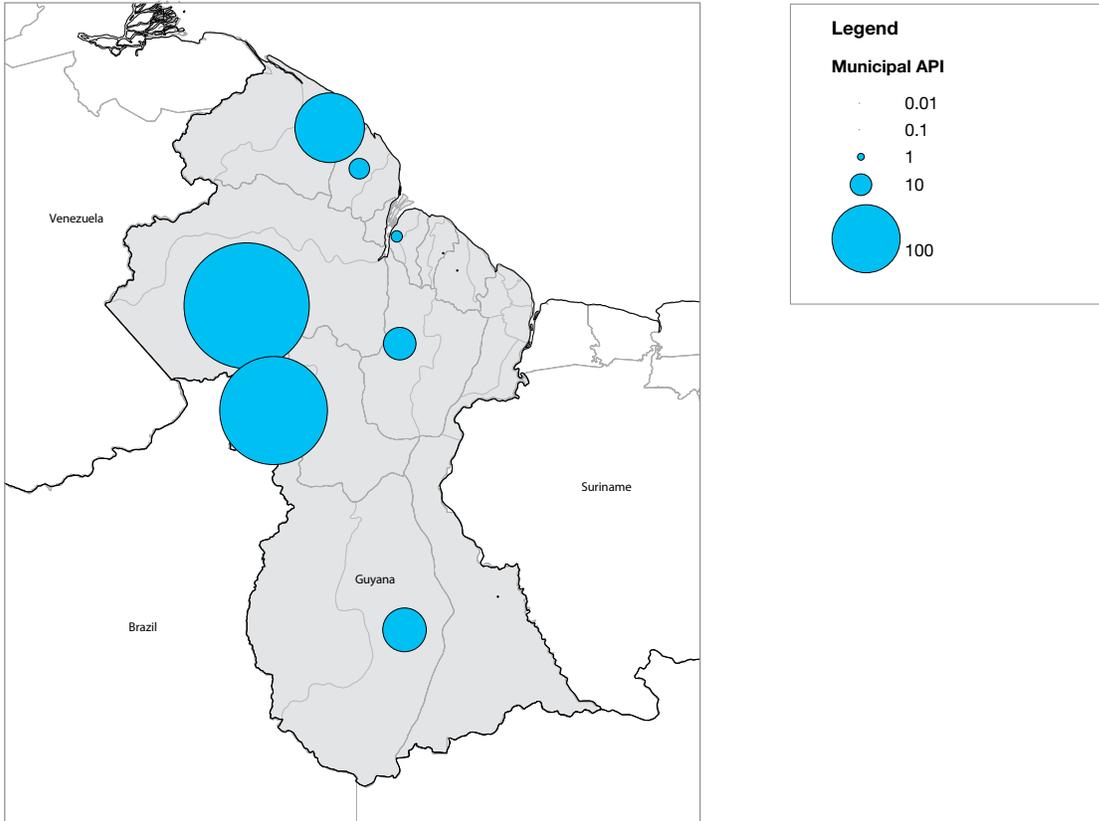
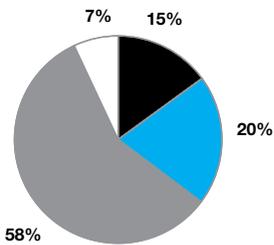


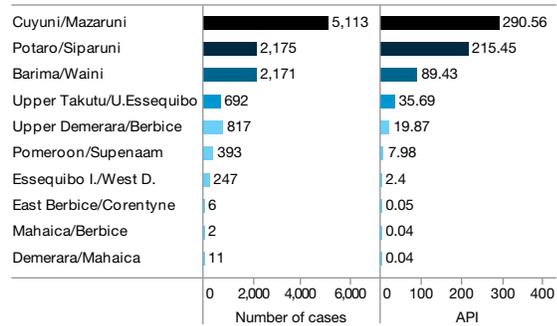
Figure 17. Population by malaria transmission risk, 2008



Population

- High risk (API > 10/1000)
- Medium risk (1/1000 < API < 10/1000)
- Low risk (API < 1/1000)
- Malaria free areas (No indigenous transmission)

Figure 18. Annual Parasite Index (API) and number of cases by district, 2008



API (cases/ 1000 people at risk)

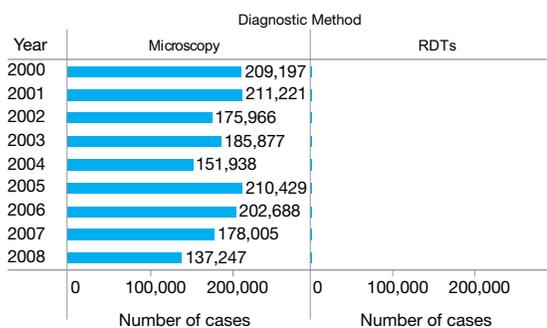
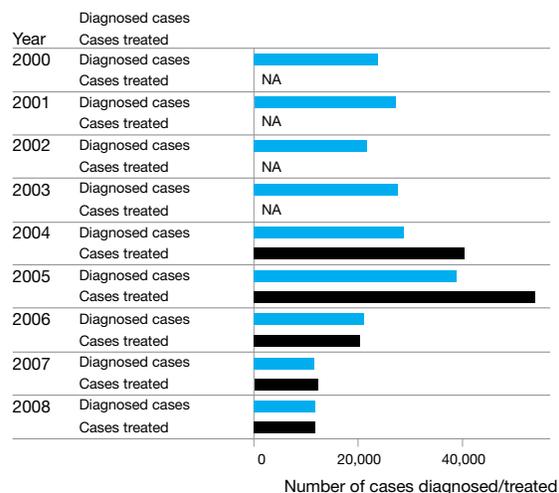


Figure 19. Population by malaria transmission risk, 2000-08

Year	High risk (API > 10/1000)	Medium risk (1/1000 < API < 10/1000)	Low risk (API < 1/1000)	Malaria free areas (No indigenous transmission)
2000	59,000	45,000	511,000	146,000
2001	59,000	45,000	511,000	149,000
2002	63,000	88,000	468,000	145,000
2003	63,000	30,000	556,000	115,000
2004	93,000	45,000	511,000	115,000
2005	112,000	49,000	537,000	52,428
2006	71,000	41,000	586,000	52,428
2007	71,354	41,112	638,757	52,428
2008	112,466	152,314	434,015	52,428

Figure 20. Slides examined and Slide Positivity Rate (SPR), 2000-2008

Year	Number of slides examined	Number of slides positive	Slide Positivity Rate (%)
2000	209,197	24,018	11.48
2001	211,221	27,122	12.84
2002	175,966	21,895	12.44
2003	185,877	27,627	14.86
2004	151,938	28866	19
2005	210,429	38,984	18.53
2006	202,688	21,064	10.39
2007	178,005	11,657	6.55
2008	137,247	11,815	8.61

Figure 21. Cases diagnosed by microscopy and RDTs, 2000-08**Figure 22. Number of cases diagnosed and cases treated, 2000-2008**

NA- No Data Available

Figure 23. Slide Positivity Rate (SPR) by ADM1, 2008

ADM1	Examined	Total cases	SPR (%)
Cuyuni/Mazaruni	22,463	5,113	22.76
Potaro/Siparuni	30,427	2,175	7.15
Barima/Waini	22,180	2,171	9.79
Upper Demerara/Berbice	3,113	817	26.24
Upper Takutu/U.Essequibo	31,593	692	2.19
Pomeroon/Supenaam	8,482	393	4.63
Essequibo I./West D.	647	247	38.18
Demerara/Mahaica	19,402	11	0.06
East Berbice/Corentyne	333	6	1.8
Mahaica/Berbice	11	2	18.18

Figure 24. Time span between onset of symptoms and diagnosis, 2008

No Data Available

Figure 25. Number and percentage of cases by age group, 2008

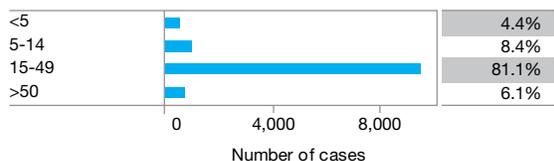


Figure 26. Number and percentage of cases by locality type, 2008

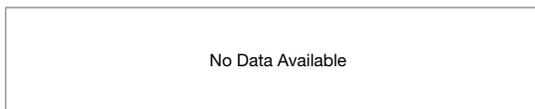


Figure 27. Number and percentage of cases in pregnant women among women of child bearing age, 2008

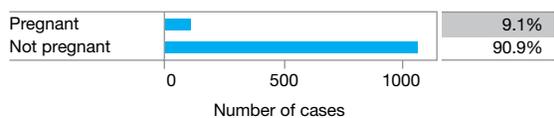


Figure 28. Number and percentage of cases, 2008

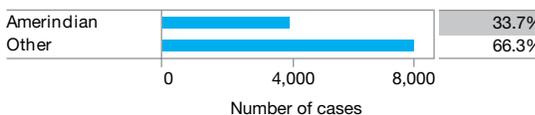


Figure 29. Proportion of *P. falciparum* cases, 2000-2008

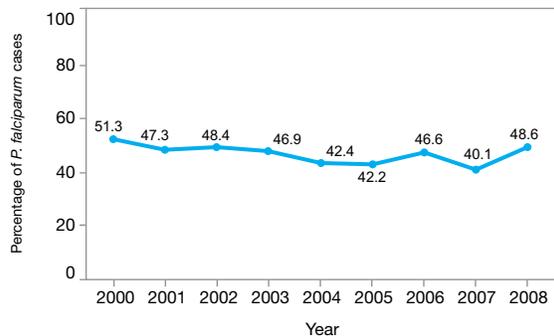


Figure 30. Number of ACT treatments distributed by year, 2000-08

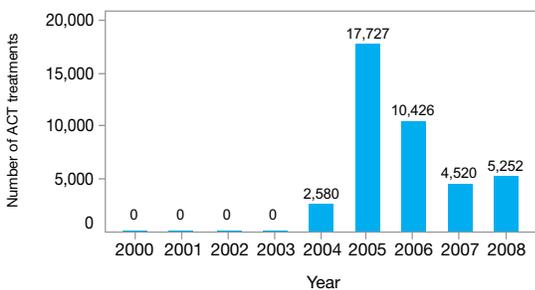


Figure 31. Indoor residual spraying coverage by year, 2000-08

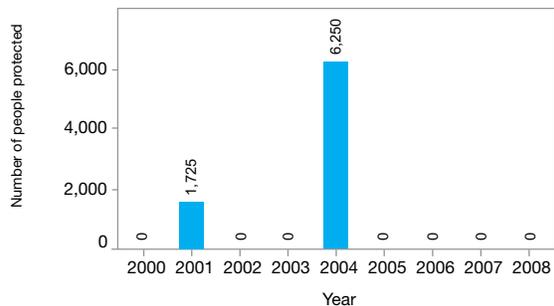


Figure 32. Number of LLINs distributed by year, 2000-2008

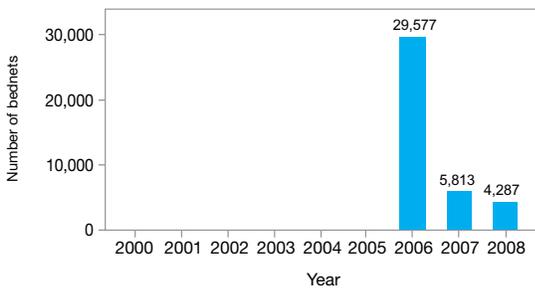


Figure 33. Number of ITNs distributed by year, 2000-08

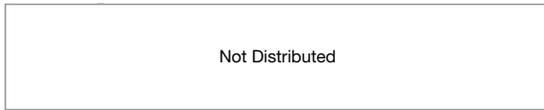
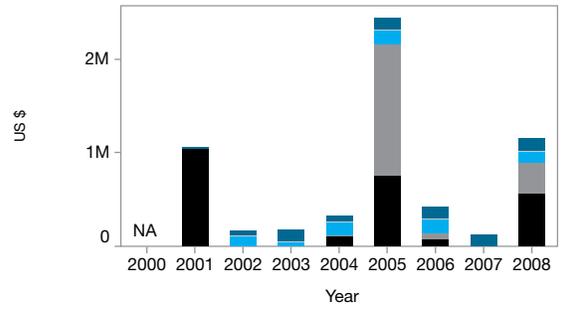


Figure 34. Sources for malaria control funds by year, 2000-08



Financing sources

- USAID
- Other bilateral funds
- Government
- UN agencies
- Global Fund

NA - Data not available