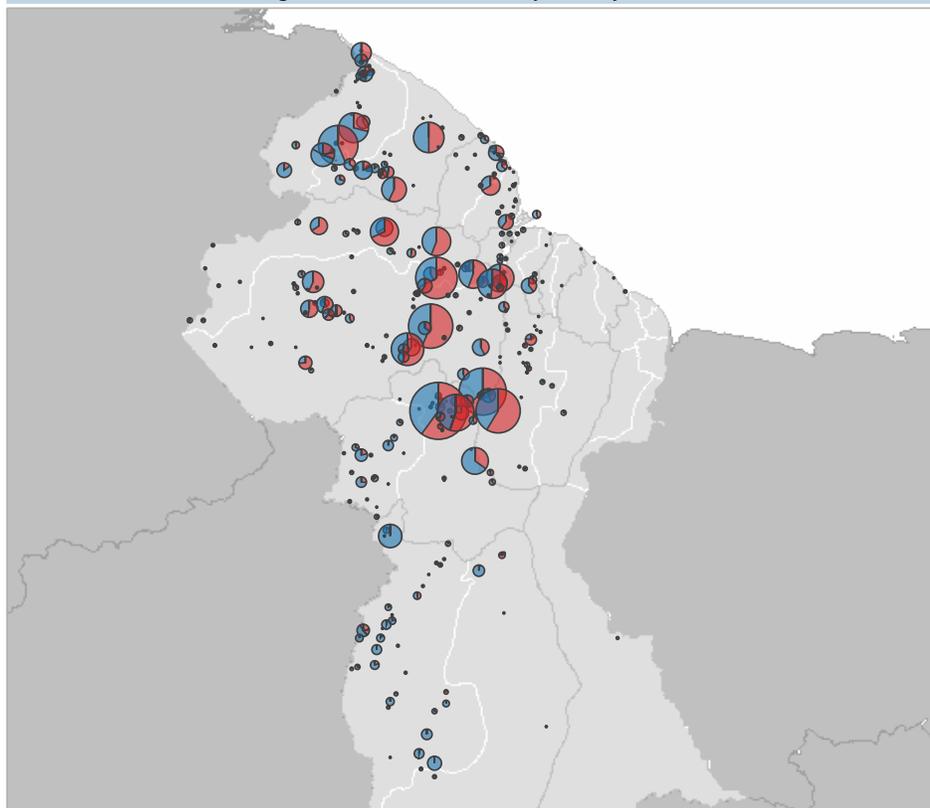


Guyana

Figure 1. Number of cases by locality. 2008



N° of malaria cases in 2008	11,815
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P. falcip y mixed	5,741
P. vivax	5,920

Número de casos

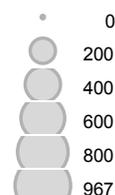
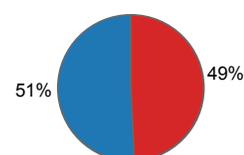


Figure 2. Proportion of cases by species



Plasmodium species

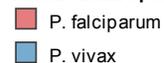
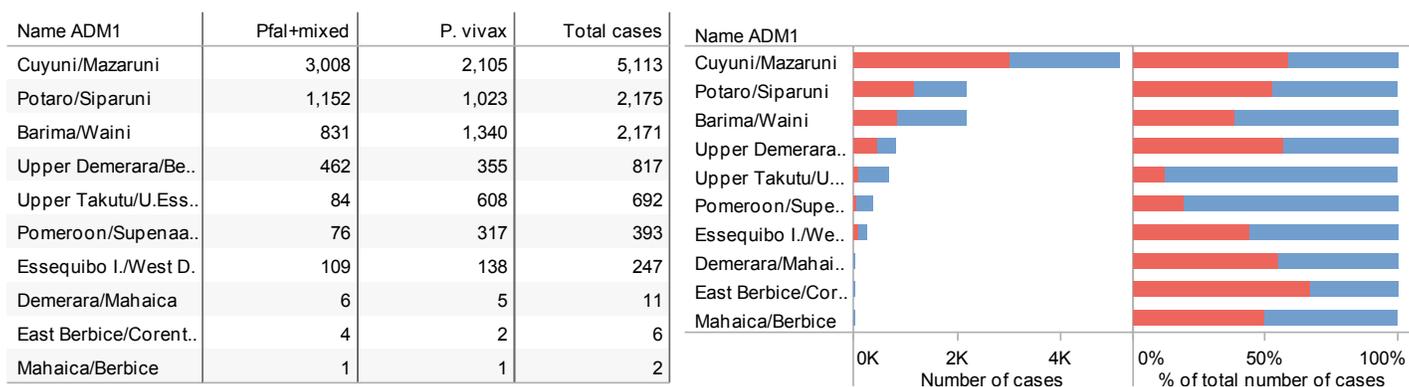


Figure 3. Number of malaria cases by species by ADM1 level in 2008



Overview of the malaria situation

Figures 1-5

Guyana has been historically one of the countries of the Americas, where malaria represents a major public health problem. Never-the-less the number of cases is much lower than in countries such as Brazil, Peru, Venezuela and Colombia. This reduction can be recognized in the incidence rate for the past four years. 2005 (52 per 1000), 2006 (28 per 1000), 2007 (15 per 1000), 2008 (15 per 1000).

An. darlingi is the most important vector in the interior of Guyana, whereas *An. aquasalis* is incriminated as a secondary and poor vector of malaria transmission on the coastland of the country. The transmission of malaria in Guyana is focused/ endemic mainly in the gold Mining and logging areas of the interior in regions 1 and 2 (part), 7,8,9 and 10 (partially). Currently, *P. falciparum* has been established in areas that were previously under control or eradicated and the transmission power predominates in highly mobile populations, with little or no immunity.

In 2008 there were 11,815 positive new cases in Guyana (41 cases foreign imported) of which 5252 were for malaria *P. falciparum*. Region 7 (Cuyuni / Mazaruni) reported 5190 cases, 44% of malaria in the country, this being the region with the largest movement of people by Mining activities. The dispersion and major problems of access in areas dominated by Mining/ logging areas poses major difficulties in malaria control.

Trends in morbidity and mortality

Figures 4 - 11

In 2005 there was a major peak of malaria in Guyana, with 38,984 cases; thereafter the number of cases has decreased, with stabilization in 2007 and 2008. In 2008 *P. vivax* has increased slightly comparing to the number of cases of malaria *P. falciparum* for the same year. Between 2007 and 2006 malaria had decreased significantly in the region 8, 9 and 1, but in

2008 the performance was almost similar to that recorded in 2007.

The decrease in the number of cases was also accompanied by a reduction in mortality. In 2008 one death was reported in Guyana .

Scattering / focalization

Figures 1, 12-19

The District of Mazaruni in the western side of the country, recorded 3016 new cases, 25.5% of the total burden of cases in the country. The districts of Cuyuni and Potaro, recorded 2113 and 2175 new cases respectively. Together these three mining and logging districts accounted for 61.8 % of the new cases in the country, which means a major focus of the problem. Within the districts, however, malaria presents a significant dispersion in localities, making it difficult to control.

In Guyana, malarious localities are georeferenced, allowing the mapping of diseases at this level. In 2008 only 352 localities were reported as the source of cases but of these, 206 reported less than 5 cases. Only 32 districts experienced more than 50 cases in the year. Six localities had more than 250 cases a year.

In Region 8, the town of Mahdia, recorded in 2008 ,983 new cases. This locality had the highest number of cases in the country, and the towns of Konawaruk region 8, Omai region 7 and Mabura Hill, regions 10 , constitute a major focus of transmission at the confluence of these three regions located in almost the center of the country.

These are a Gold Mining and loggings area, where about 54% of the cases were *P. falciparum*, affecting mostly Afro-Guyanese population.

Malaria in special groups

Figures 25-28

In 2008 Guyana notified 517 cases of malaria in children under 5 years, representing only 4.3 % of total malaria

Report on Situation of Malaria in the Americas, 2008 (Working Document)

Figure 4. Number of cases by specie 2000-2008

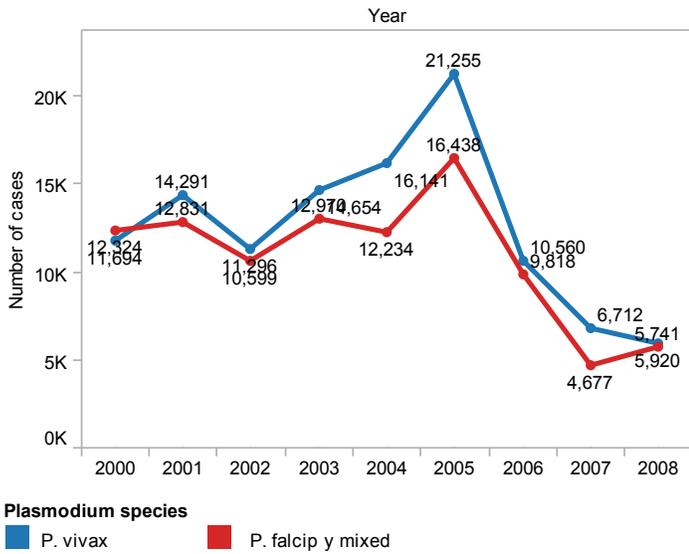


Figure 8. Annual variations in number of cases

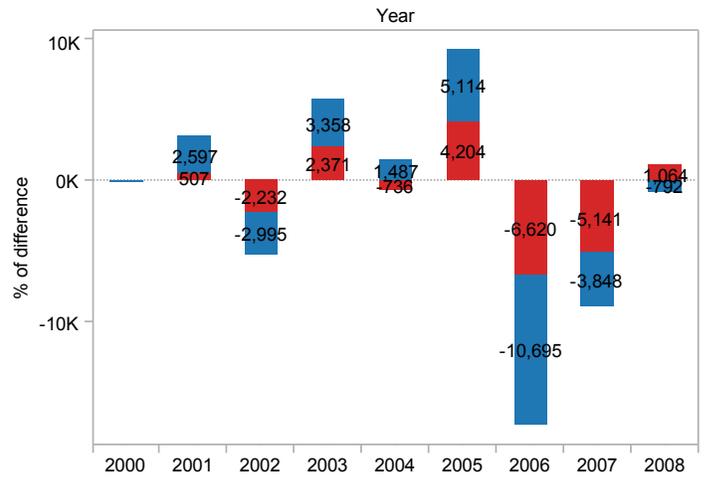


Figure 5. Number of malaria cases, 2000 - 2008

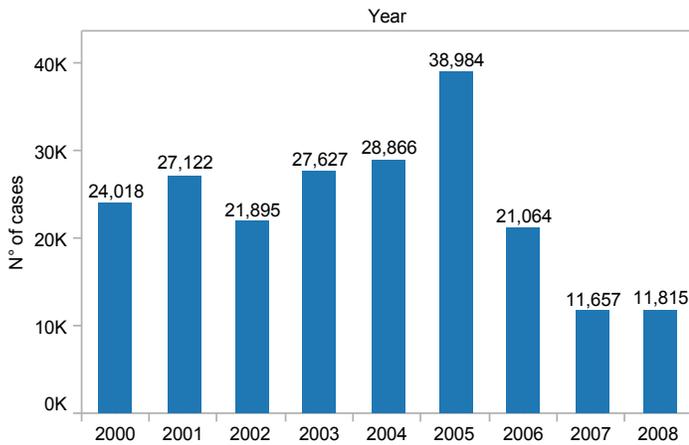


Figure 9. Difference (%) in number of cases with 2000

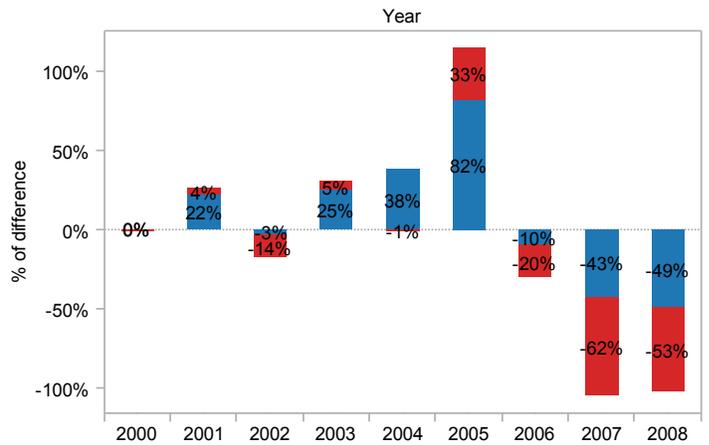


Figure 6. Number of malaria deaths 2000-2008

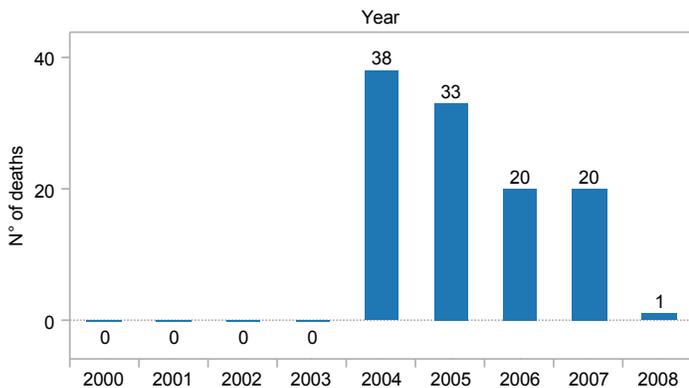


Figure 10. N° of cases and RBMI / MDG targets for 2010 and 2015

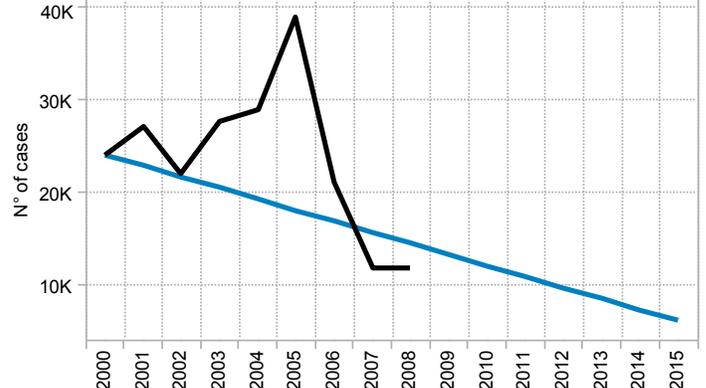


Figure 7. Number of hospitalized malaria cases, 2000 - 2008

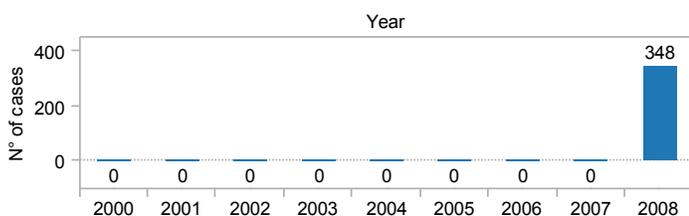


Figure 11. % of hospitalized cases, 2008



N° of cases
■ notified cases
■ targets for 2010 and 2015

% of cases
 % ambulatory
 % hospitalized

Figure 12. Localities with highest malaria burden and accumulated proportion, 2008

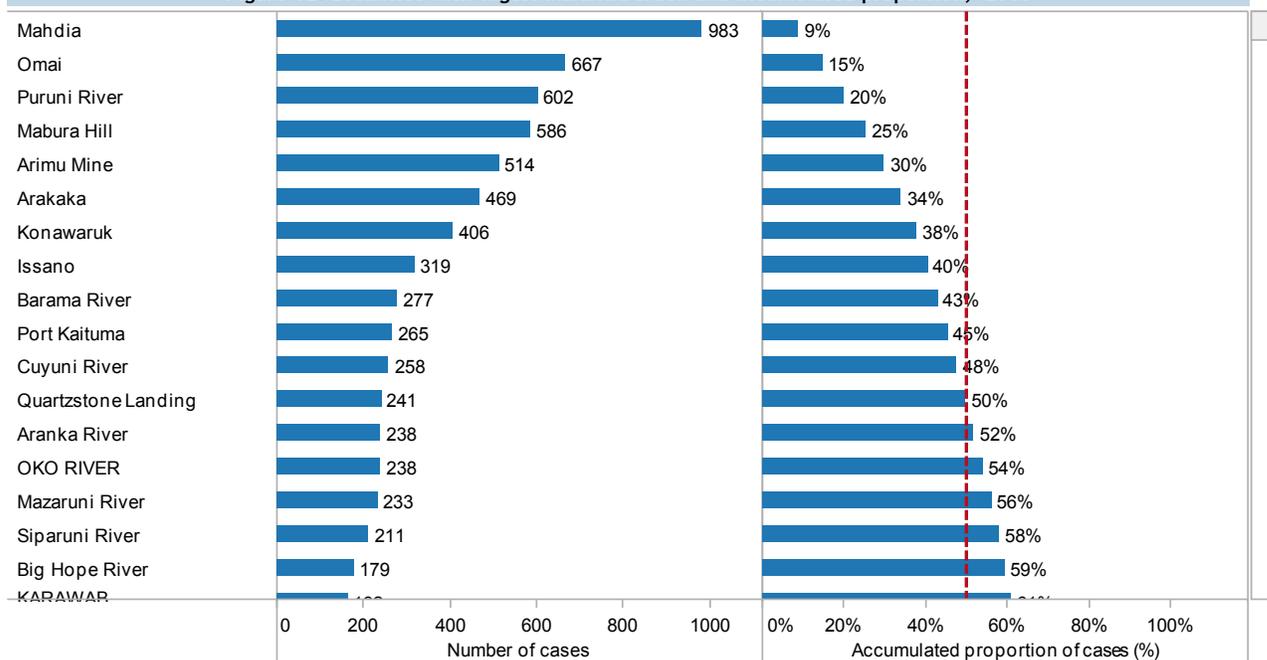


Figura 13. Localities by number of malaria cases

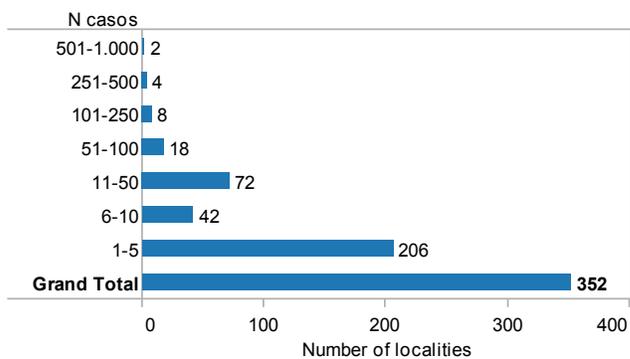


Figure 14. Localities by number of P. falciparum cases

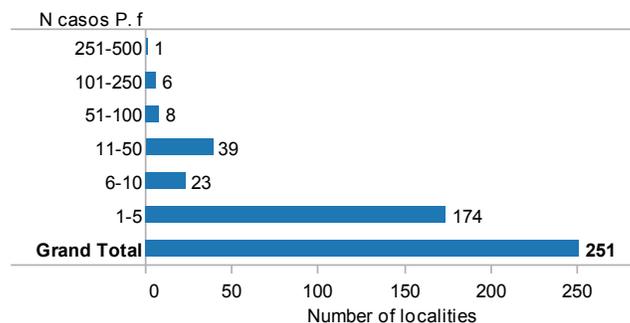


Figure 16. Annual incidence (API) by ADM1 level, 2008

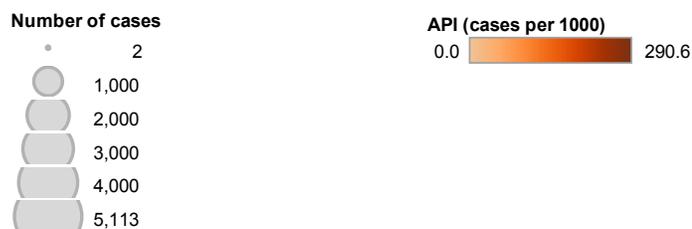
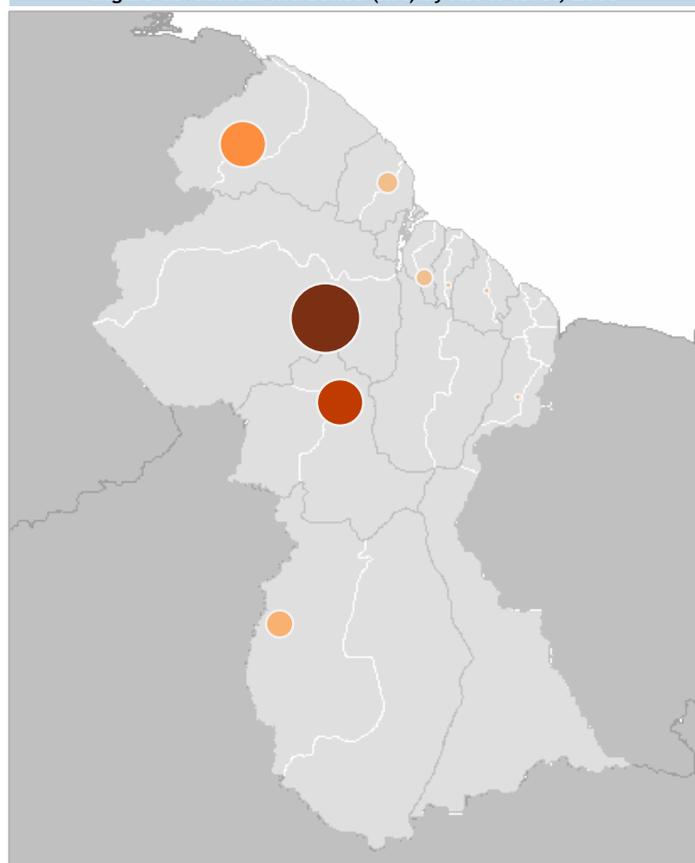


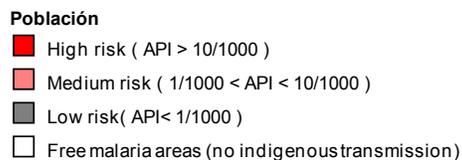
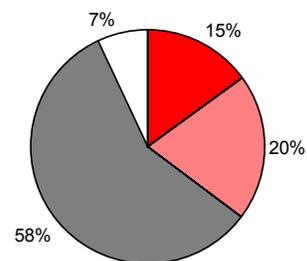
Figure 18. Annual incidence (API) and number of cases by ADM1 level

ADM1 Level	Number of cases	Cases per 1000
Cuyuni/Mazaruni	5,113	290.6
Potaro/Siparuni	2,175	215.5
Barima/Waini	2,171	89.4
Upper Takutu/U.Essequibo	692	35.7
Upper Demerara/Berbice	817	19.9
Pomeroon/Supenaam	393	8.0
Essequibo I./West D.	247	2.4
East Berbice/Corentyne	6	0.0
Mahaica/Berbice	2	0.0
Demerara/Mahaica	11	0.0

Figure 17. Population by malaria transmission risk

Year	High risk (API > 10/1000)	Medium risk (1/1000 < API < 10/1000)	Low risk(API< 1/1000)	Free malaria areas (no indigenous tra..)
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 19. Population by malaria transmission risk



cases in the country. Along with Costa Rica, Guyana is the country with the lowest proportion of cases in this age group, which can be explained by the relationship one has with the endemic Mining areas. 81% of cases in 2008 were in people between 15 and 49 years and there was a very marked predominance of malaria in males (80% of cases).

In Guyana, the Amerindian population is significantly affected by malaria. In 2008 the percentage of cases occurred in this ethnic group was 34%, much higher in most countries as reported.

In the districts of Rupununi West region 9, Moruka/Pomeroon region 2, and Ireng / Upper Potaro region 8, the proportion of cases in Amerindians was 86, 69 and 79% respectively. Overall in the region 9, south of the country, there was a predominance of Amerindian origin population among those affected by malaria and a much higher prevalence in the region.

Among all women between 15-45 years old with malaria in 2008, the pregnant women accounted for 9 % of cases. A similar percentage to that observed in Brazil and higher than other countries like Colombia and Bolivia, which can mean a better record of this event than in other countries.

Diagnosis and treatment

Figures 20-24, 29-30

As in the rest of the Amazon region, *P. falciparum* malaria in Guyana is resistant to chloroquine and sulfadoxine-pyrimethamine. In 2004 Guyana antimalarial policy change and introduced the use of therapeutic combinations with artemisinin derivatives as first line treatment for uncomplicated *P. falciparum* malaria.

In 2004 2580 ATM + LUM treatments were distributed. Both malaria *P. falciparum* and *P. vivax* rose sharply during 2005, as it did in Brazil and many other countries in a region.

In 2005 17,727 ACT treatments were distributed and more than 10,000 treatments in 2006. At the end of 2006 the number of cases had dropped remarkably and the MCP has maintained Artemether+lumefantrine as first line therapy and until 2008 has done two evaluations of therapeutic efficacy.

The slide positivity rates in 2008 was 8.6% in Guyana, a proportion similar to that of other countries in the region and even below that recorded in Brazil and Colombia. This positivity rate is lower than the annual average during the decade, but increased slightly over the previous year. In 2008 the number of thick smears performed was reduced compared to 2007, although the number of cases was similar, which may draw attention to the need for enhanced microscopy for the early detection of cases.

Time span between symptoms onset and the diagnosis is not recorded by the information system, but it is noteworthy that many of the infected cases in the outbreaks in regions 7 and 8 were diagnosed in 2008 in the city of Georgetown. In 2008, 2143 of the 5190 cases in the Region 7 (41%) were diagnosed and treated in the capital.

In 2008 there was no report on the use of rapid tests in the Malaria program as method of diagnosis in Guyana.

The easy accesses for the people in Mining areas have to medicines which are not recommended by the Ministry of Health is a problem for the malaria treatment policy in Guyana. The indiscriminate use of these drugs to suppress clinical symptoms difficult to detect cases by diagnosis and can emerge to wide spread resistance

Prevention and vector control

Figures 31-33

The implementation of long lasting impregnated nets started in Guyana in 2006, with distribution of 29,577 LLINs purchased by the government and with support from the Global Fund, RAVREDA projects, LLINs are currently the primary

Report on Situation of Malaria in the Americas, 2008 (Working Document)

Figure 20. Slides examined and Slide Positivity Rate (SPR) in 2008

Year	Examined slides	Positive slides	% of positive slides
2000	209,197	24,018	11.5
2001	211,221	27,122	12.8
2002	175,966	21,895	12.4
2003	185,877	27,627	14.9
2004	151,938	28,866	19.0
2005	210,429	38,984	18.5
2006	202,688	21,064	10.4
2007	178,005	11,657	6.5
2008	137,247	11,815	8.6

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

Name ADM1	Examined	Total cases	SPR (%)
Cuyuni/Mazaruni	22,463	5,113	22.8
Potaro/Siparuni	30,427	2,175	7.1
Barima/Waini	22,180	2,171	9.8
Upper Demerara/Be..	3,113	817	26.2
Upper Takutu/U.Ess..	31,593	692	2.2
Pomeroon/Supenaa..	8,482	393	4.6
Essequibo I./West D.	647	247	38.2
Demerara/Mahaica	19,402	11	0.1
East Berbice/Corent..	333	6	1.8
Mahaica/Berbice	11	2	18.2

Figure 21. Cases diagnosed by microscopy and by RDT

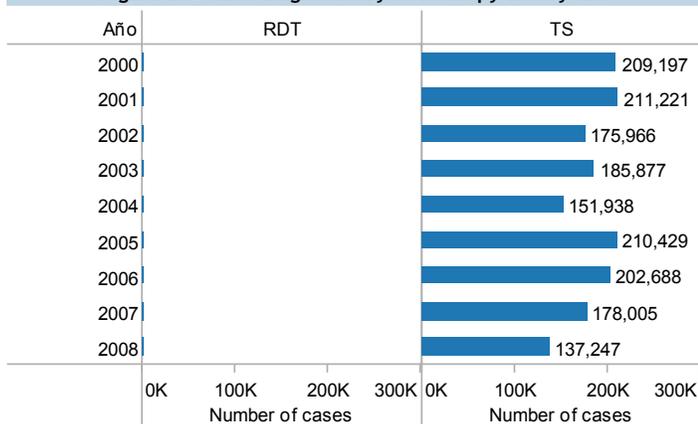


Figure 24. Time span between onset of symptoms and diagnosis

Time span between onset of symptoms and diagnosis (days)

Figure 25. Number and % of cases by age group

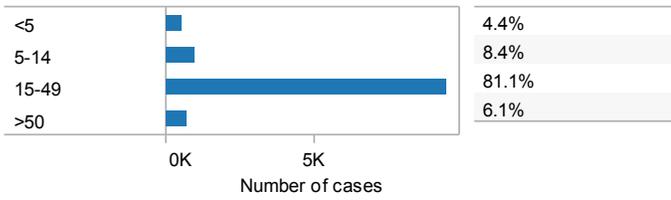


Figure 26. Number and % of cases by locality type

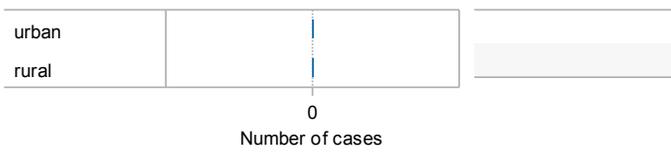


Figure 27. Number and % of cases in pregnant women

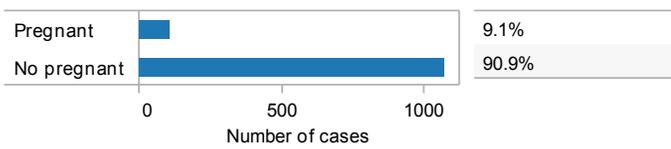


Figure 28. Number and % of cases in amerindian population

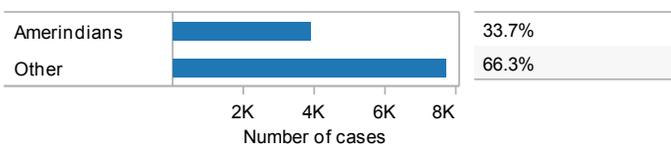


Figure 29. Proportion of P. falciparum cases, 2000-2008

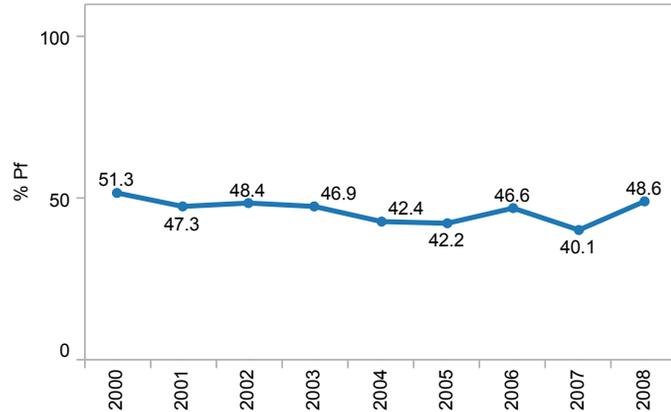


Figure 30. Number of ACT treatments distributed by year

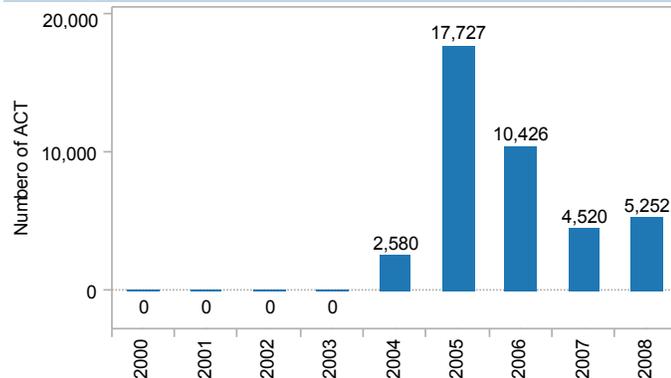


Figure 31. Indoor residual spraying coverage

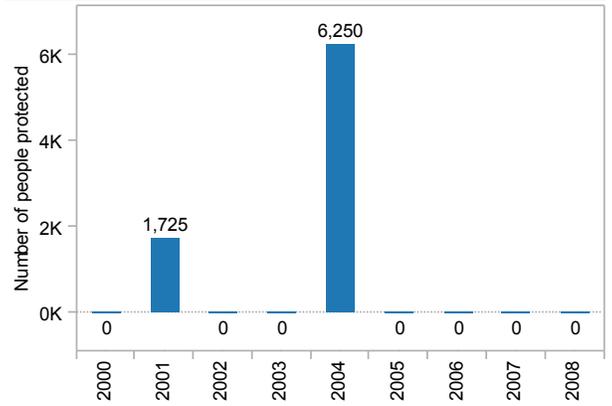


Figure 32. Long lasting impregnated net coverage

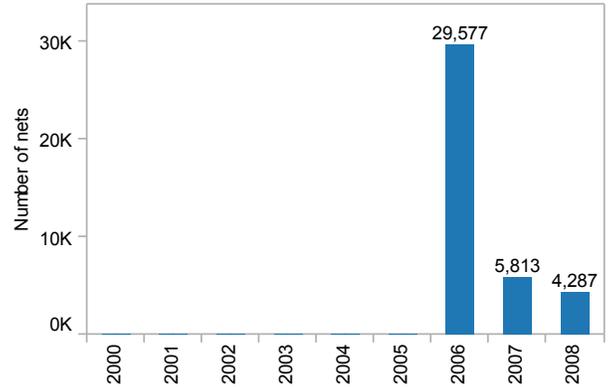


Figure 33. Conventional insecticide impregnated net coverage

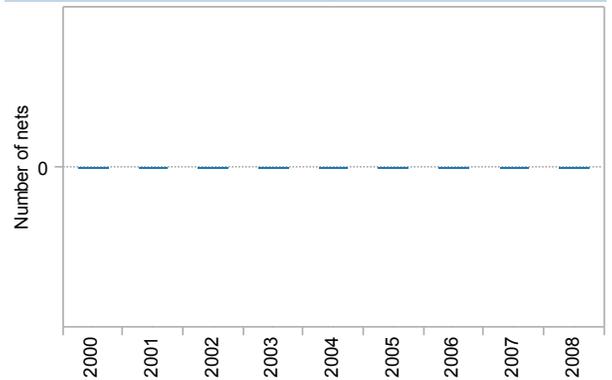
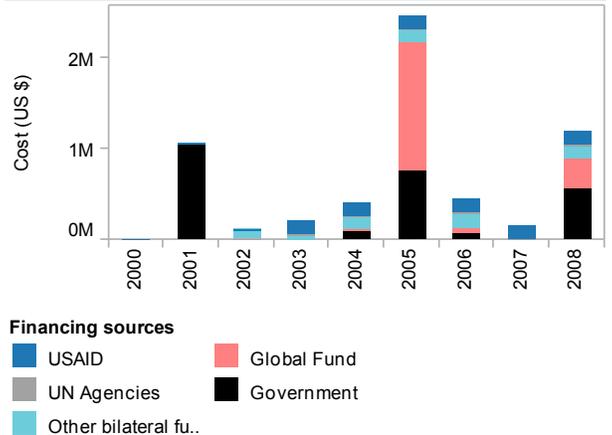


Figure 34. Financing sources



intervention for vector control on malaria in Guyana. The policy for the distribution of 2 LLINs per house-hold and the development of joint intervention with LLIN distribution of access to treatment with ACT.

In the years 2007 and 2008, the AMI project, USAID also supported the distribution of mosquito nets and distributed 5813 and 4287 for the respective year. In this years distribution focused on vulnerable groups such as pregnant mothers, children under 5 years, miners and logger in Regions 1, 7, 8, 9 and 10. Currently no IRS has been done

Malaria control financing

Figure 34

Since 2005, Guyana became a beneficiary of a project for malaria control funded by the Global Fund, which in recent years has supported the intensification of control activities in priority regions. The European Union and RAVREDA, supported by USAID in coordination with the Pan American Health Organization under the AMI project have been supplemented by external cooperation to control this disease. In 2008 approximately half of the funding of control measures was from external sources.