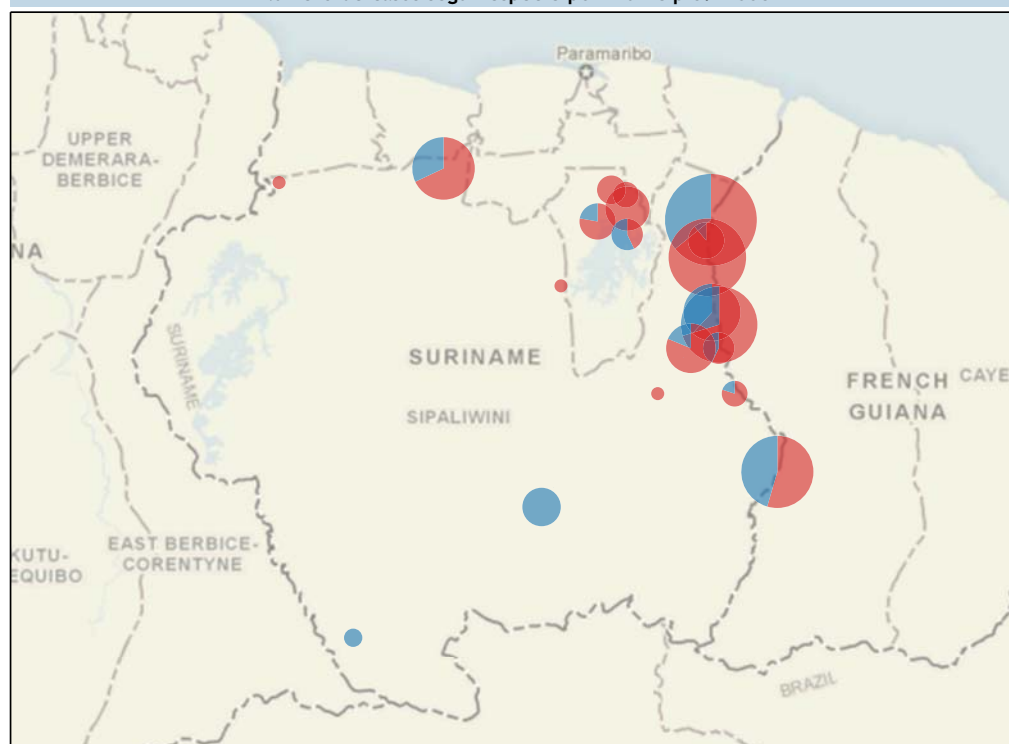


Suriname

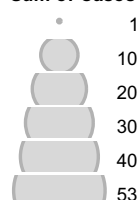
Número de casos según especie por municipio. 2008



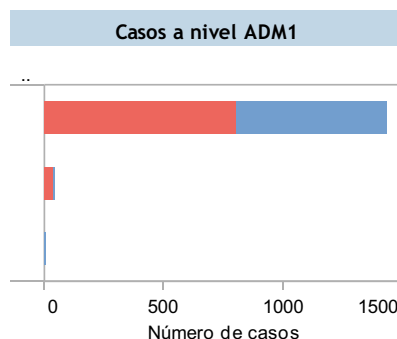
Especie

Pf
Pv

Sum of Casos



Casos por ADM1			
ADM1	ADM 1	Pfal+mixtas	P. vivax
Sipaliwini		800	633
Brokopondo		32	6
Para		0	
Grand Total		832	639
		1,488	



Overview of the malaria situation

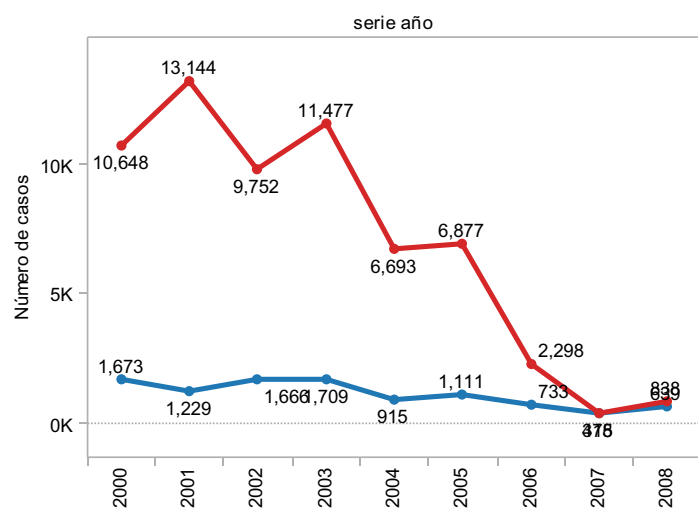
Suriname is one of the countries of the region which has reported a large reduction in malaria transmission in recent years. Malaria in Suriname has been historically an issue of prime importance in public health, being one of the countries which presented the highest incidence rates in the Americas and the highest proportions of malaria *P. falciparum*. In the past five years a significant reduction in transmission has been seen; from 14,403 cases in the year 2003 to 1477 cases in 2008.

Suriname has less than half a million inhabitants with the majority living in the coastal areas. The hinterland has areas populated by Amerindians, non-indigenous “maroons” populations of African descent, and a population of mixed origins (including Brazilian migrants) dedicated to mining activities. There is no malaria transmission on the northern coast of Suriname, where the majority of the population lives. Malaria risk is greatest along the Marowijne River, which borders French Guiana, as well as in areas close to Brokopondo Lake in the northern-central region where *A. darlingi* is present.

Three main factors can be attributed to the change in the situation of malaria: the introduction of therapeutic combinations with artemisinin derivatives, a monitoring campaign funded by the Global Fund to intensify prevention and early diagnostic activities, and environmental factors (torrential rainstorms with exceptional floods in 2006) that led to changes in the density of vector.

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

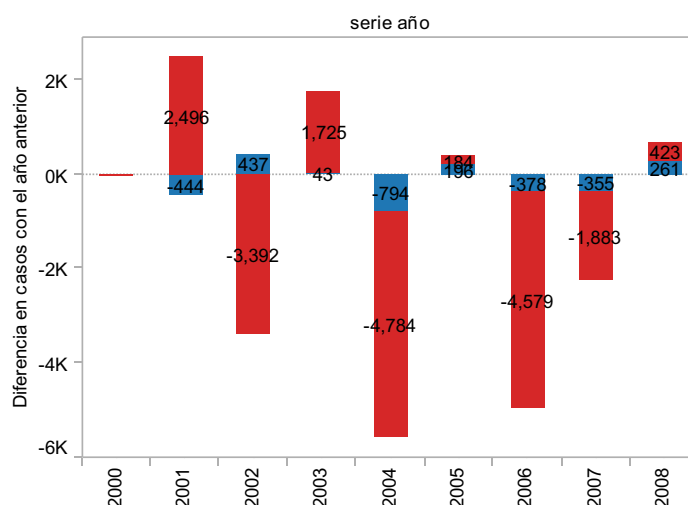
Número de casos por especie 2000 - 2008



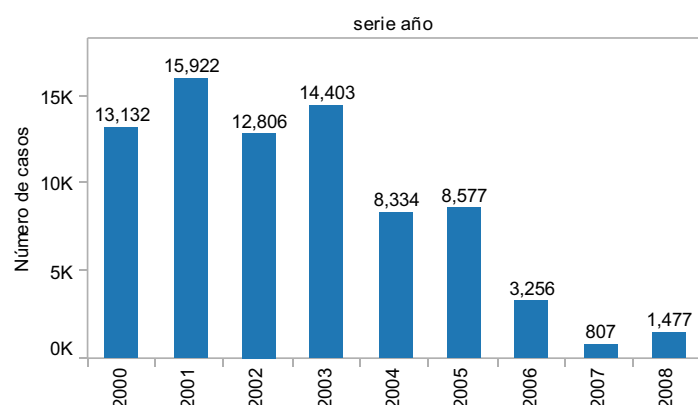
serie especie

- Number of P. Fal..
- Number of P. Viv..

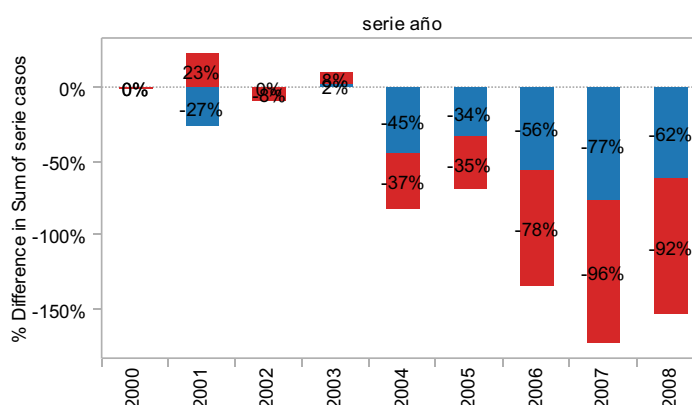
Variaciones interanuales en el número de casos por especie



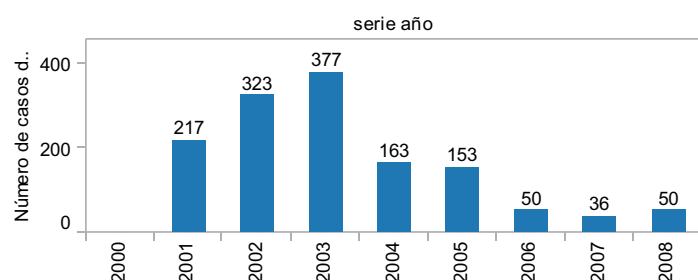
Número de casos 2000 - 2008



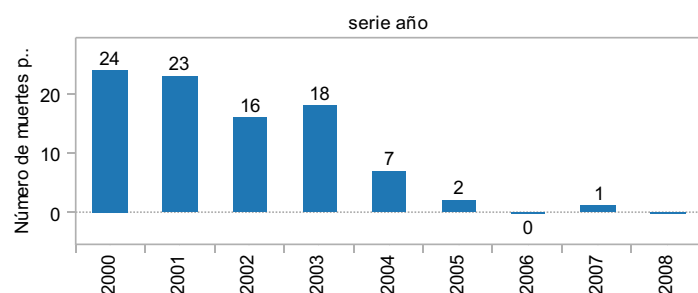
Diferencia (%) con relación al año 2000



Número de casos de malaria hospitalizados



Número de muertes por malaria 2000 - 2008

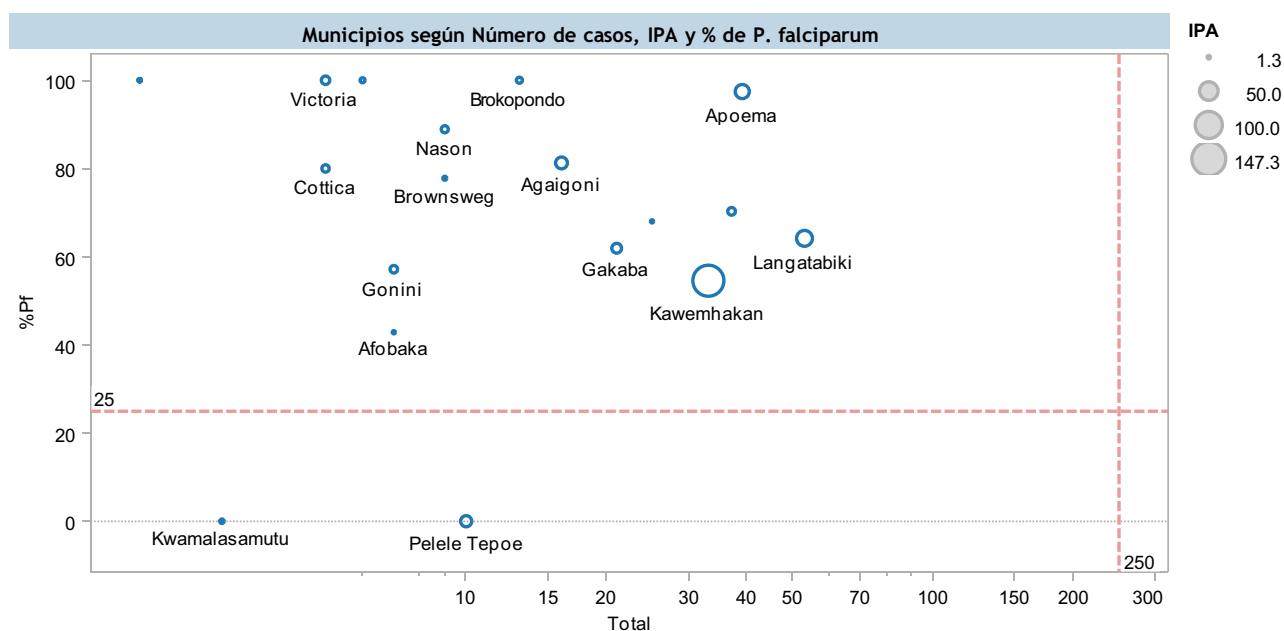
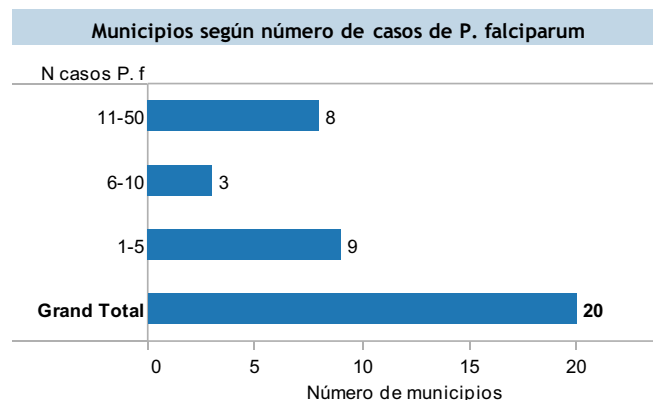
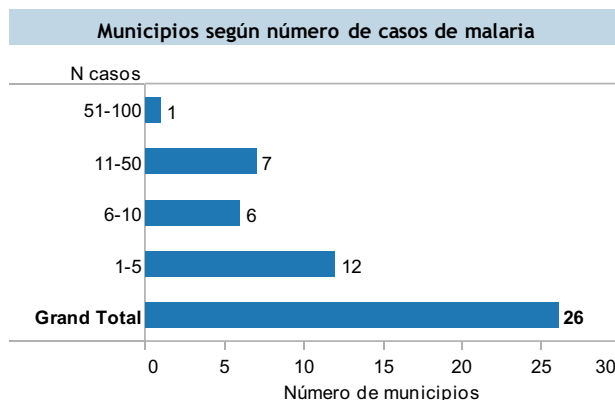
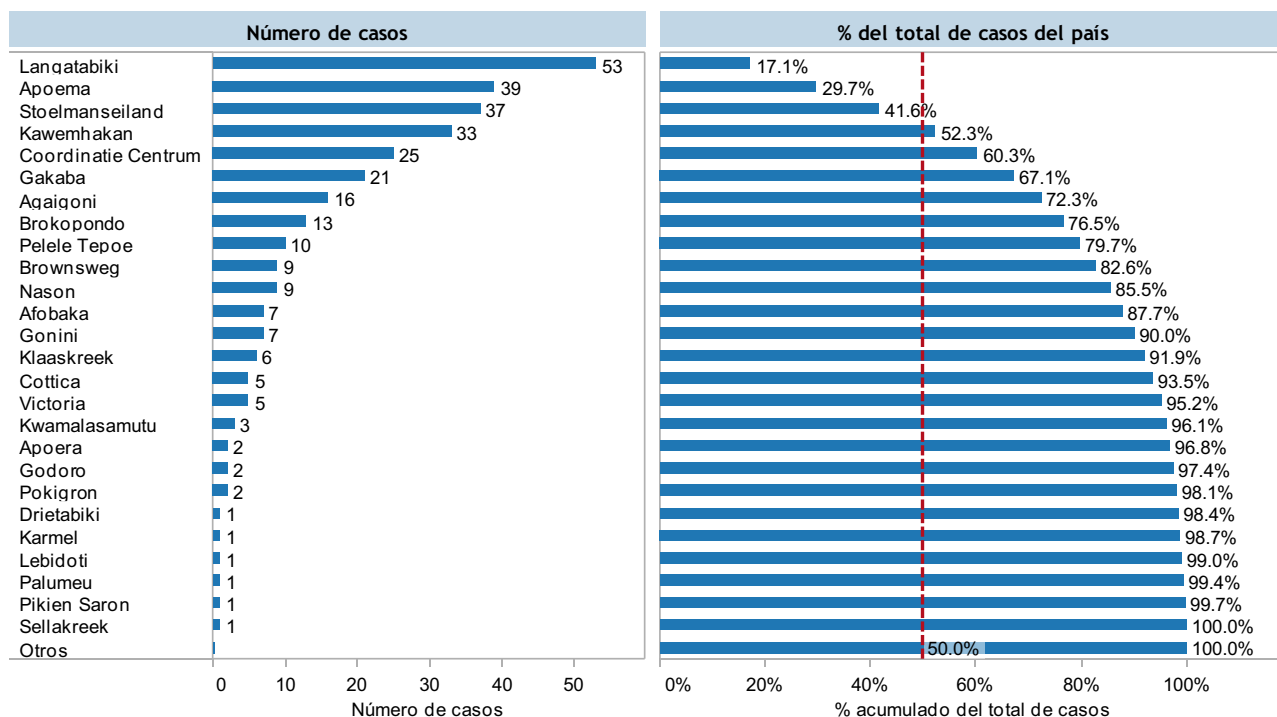


Despite the marked improvement in the epidemiological situation, malaria continues to affect the unstable population of migrants involved in mining activities; the burden of disease in these groups is not completely known. Malaria control in this situation, where migrants act as reservoirs and disseminators of the disease across the country, is the main challenge for the control program now.

Trends in morbidity and mortality

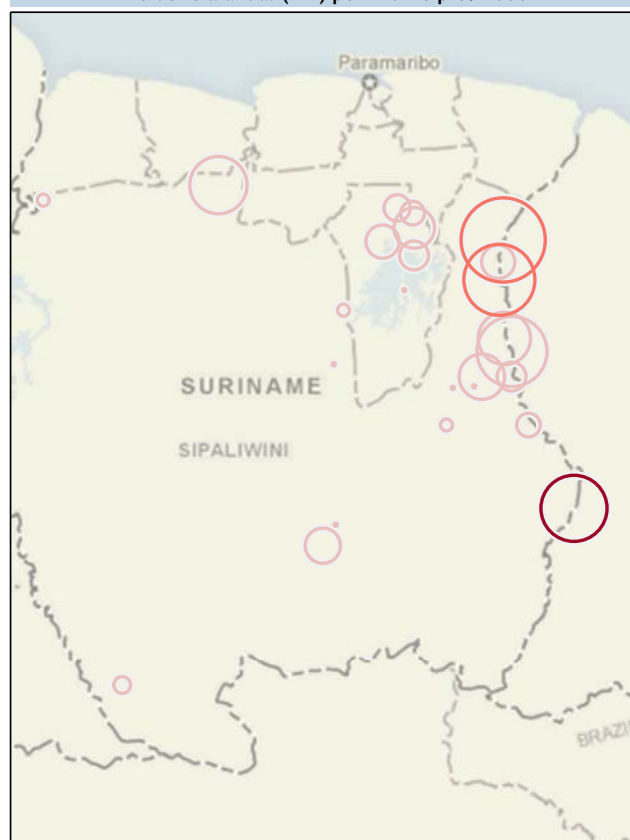
During the 80's there was an increase in the number of malaria cases consequent to an internal armed conflict. In the early 1990s, the increase was caused by the intensification of gold mining and logging activities. The outbreaks in 2003 occurred in the south of the country near the Brazilian border as well as in the eastern Marowijne region, which were associated with increased movement of people into gold-mining areas. These activities continue to be the main determinant of transmission due to displacement of populations in risk areas and the difficulty in ensuring access to health services.

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

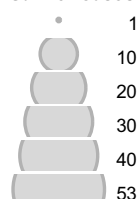


Report on Situation of Malaria in the Americas, 2008 (Working Document)

Incidencia anual (IPA) por municipio. 2008



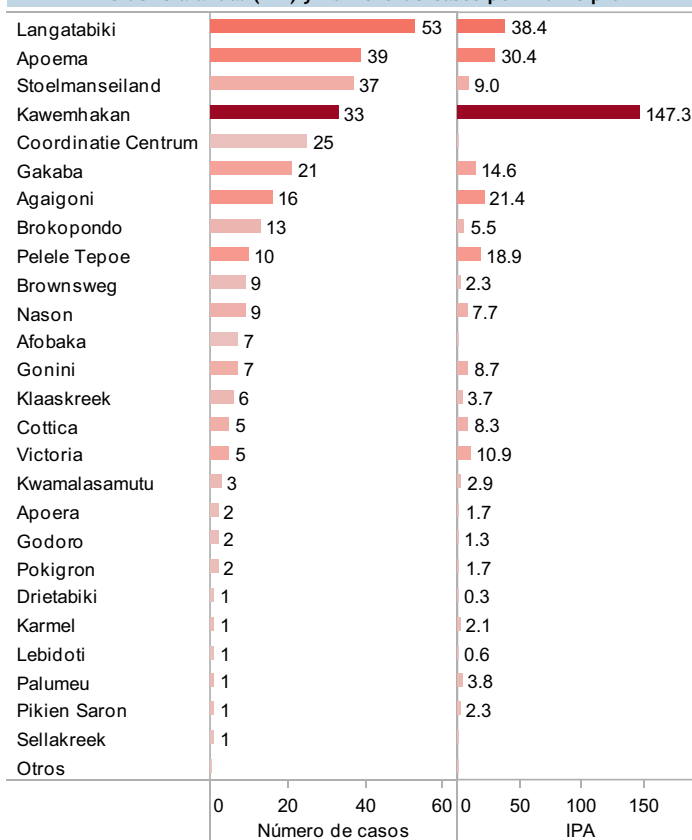
Sum of Casos



Sum of IPA



Incidencia anual (IPA) y número de casos por municipio



The reduction in transmission in recent years has been particularly marked for *P. falciparum* malaria. For the year 2008, the reduction of malaria by this species, with respect to 2000, was 92% and for *P. vivax* was 62%. The number of cases of severe malaria have been reduced from 377 in 2003 to only 50 cases hospitalized in 2008. Equally consistent has been the reduction in mortality such that in the last year no malaria attributed deaths have been reported.

Población según áreas de riesgo de transmisión de malaria

serie año	High Risk (API > 10/1000)	Medium Risk (1/1000 < API < 10/1000)	Low Risk (API < 1/1000)	Malaria-free Areas (No Indigenous Tr..
2000	19,000	9,000	34,000	355,000
2001	24,000	22,000	2,000	402,000
2002	24,000	22,000	2,000	402,000
2003	51,000	0	2,000	397,000
2004	51,000	0	2,000	397,000
2005	51,000	0	2,000	397,000
2006	46,000	2,000	0	397,000
2007	46,000	2,000	0	400,000
2008		48,000		400,000

Dispersion / focalization

The transmission is particularly focused around the Maroijne river along the border with French Guiana, however the number of cases is very low. Lagatabiki, with 53 cases, was the district that reported the most number cases in 2008 corresponding to 17% of cases in the country. Fifty percent of the cases were from only four districts, all from Maroijne region. The population density is low in Suriname, so despite having very low number of cases malaria incidence continues to be high in respect to other countries. The incidence has reduced significantly compared to levels in the 1990s. In 2008 Suriname reported an incidence rate five times lower than the neighboring countries, Guyana and French Guiana and closer to big countries like Peru and Colombia, which have different epidemiological profile and population patterns.

Kawemhakam district in Maroijne, had the highest incidence of malaria in 2008, nearly 150 cases per 1,000 inhabitants, but in general the incidence rate in most districts with the largest number of cases was lower to 15 cases per 1,000

The main foci of transmission are related to mining activity. The mining communities have a high mobility, moving within the country and to neighboring countries and spreading malaria to other communities. The living and working conditions in mining areas are highly conducive to the proliferation of vectors and an increased exposure of humans to vectors.

Malaria in high-risk groups and urban areas

In Suriname all rural malaria transmission and major outbreaks are related to transmission in gold miners. The proportion of malaria in children younger than 15 years in 2008 was ... This is compatible with malaria that involves essentially adult population because of mining activities. In 2008 ##### cases of malaria in pregnant women were registered.

The proportion of malaria cases that occurred in Amerindians in 2008 was ## %

The maroon and Brazilian immigrants working in gold mines are among the population group most affected by malaria, but the disease burden is not adequately captured by the health system.

Número de casos según grupos de edad

OPS edad	
<5	
5-14	
15-49	
>50	

0
Número de casos

% del total de casos

OPS edad	
<5	
5-14	
15-49	
>50	

Número de casos según area urbana vs rural

OPS urbano	
urbano	
rural	

0
Número de casos

% del total de casos

OPS urbano	
urbano	
rural	

Número de casos em embarazadas

OPS emb	
Embarazadas	
No embarazadas	

0
Número de casos

% del total de casos

OPS emb	
Embarazadas	
No embarazadas	

Número de casos en población indígena

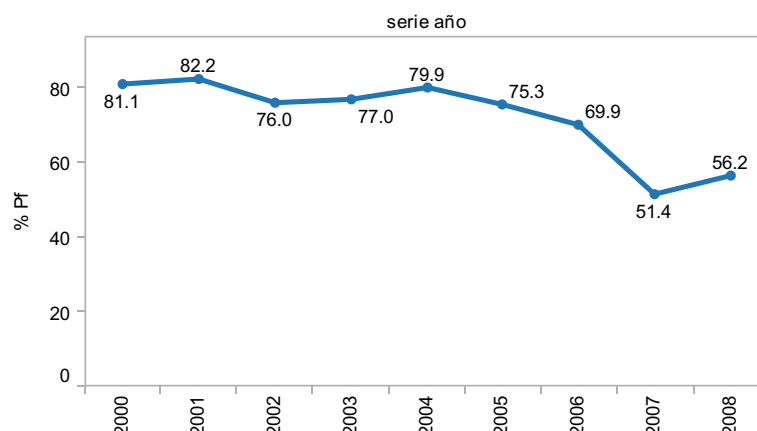
OPS ind	
Indígena	
Otro	

0
OPS ind casos

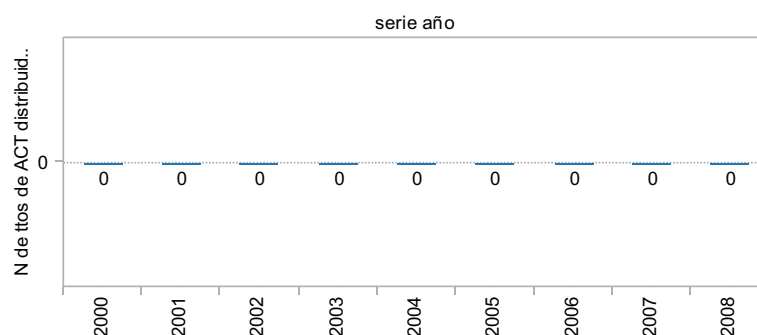
% del total de casos

OPS ind	
Indígena	
Otro	

% de casos de P. falciparum del total de casos



Número de tratamientos de ACT distribuidos por año



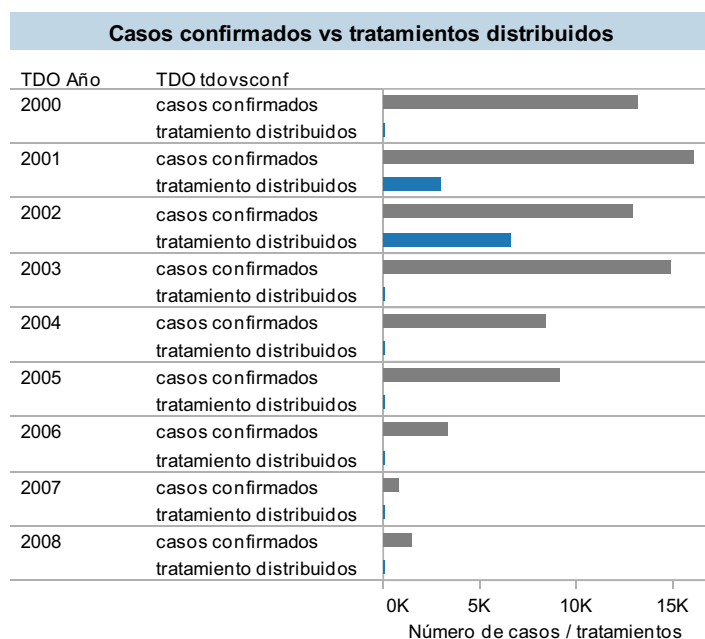
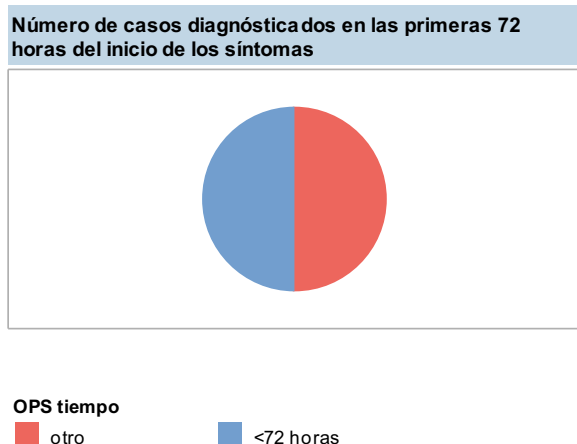
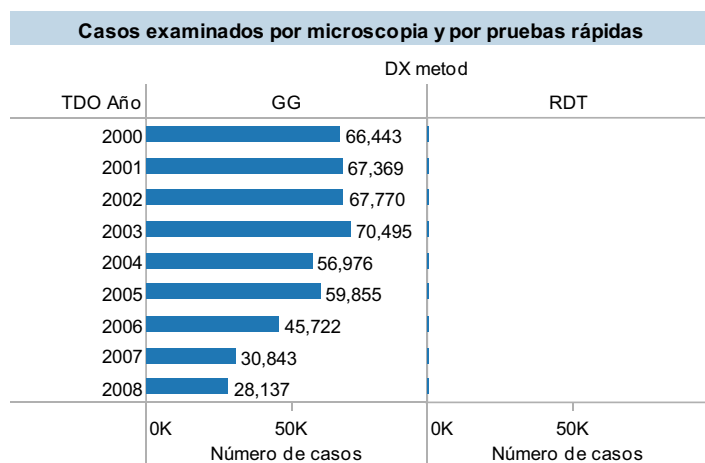
Diagnosis and treatment

In 2008 28,137 blood slides tests were done in Suriname, with a positivity rate of 5.3%, which is one of the lowest among the countries of the Amazon region. The proportion of positive slides decreased significantly over the decade, which is compatible with efforts that have been made to improve early detection of cases. Active case detection is one strategy that has been intensified to improve the timeliness of treatment. There are mobile units that provide early diagnosis and initiate the antimalarial treatment. The rapid diagnostic tests (RDTs) is another tool that has been highly used on recent years. ##### examinations were performed in 2008 with RDTs, which allow to start treatment earlier.

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Indice de láminas positivas			
serie año	Láminas examinadas	Láminas positivas	% láminas positivas
2000	66,443	13,132	19.8
2001	67,369	15,997	23.7
2002	67,770	12,837	18.9
2003	70,495	14,906	21.1
2004	56,976	8,379	14.7
2005	59,855	9,131	15.3
2006	45,722	3,289	7.2
2007	30,843	807	2.6
2008	28,137	1,490	5.3

Indice de láminas positivas por ADM1. 2008			
ADM1 ADM 1	Examinados	Total casos	ILP (%)
Sipaliwini	25,692	1,450	5.6
Brokopondo	2,722	38	1.4



In 2004, Suriname introduced the use of AT+LUM as first line treatment of *P. falciparum* malaria and this policy change has partly led to the dramatic impact on the transmission of *P. falciparum* malaria. Since 2001, Suriname has implemented a strategy for monitoring drug resistance as part of the activities of the Amazon Network for Monitoring Antimalarial Drug Resistance (RAVREDA) coordinated by PAHO with funding from USAID through the AMI project.

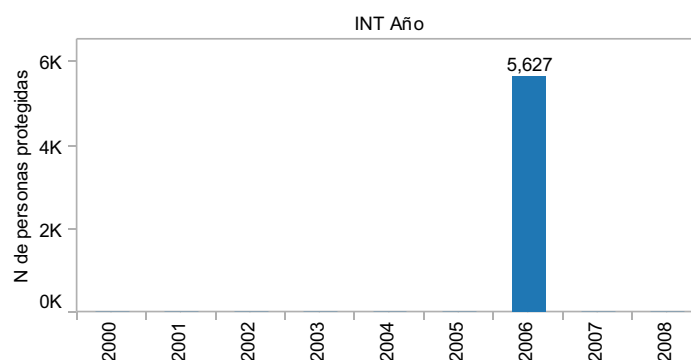
In terms of treatment, a major difficulty for the control program is to control the use of non-recommended antimalarials and self-medication by the mining population. This practice contributes to the spread of resistance and the perpetuation of transmission.

Prevention and control vector

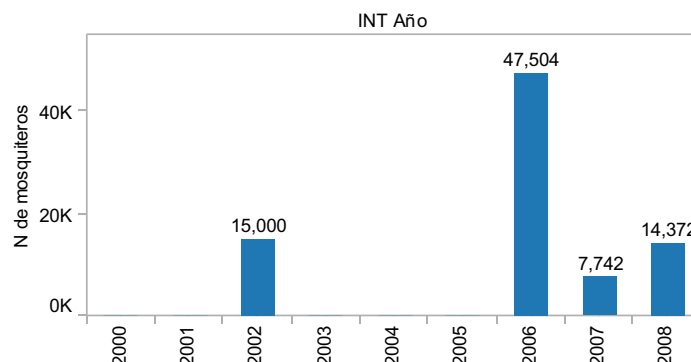
Currently, long-lasting insecticide treated nets (LLINs) are the primary prevention strategy in Suriname. In recent years the program distributed approximately over 70,000 mosquito nets. It is believed that virtually the entire population in the endemic areas has access to nets. The indoor residual spraying complements insecticide treated nets (ITNs). During 2008 ##### houses were sprayed.

Since the beginning of the decade Suriname has been making progress in implementing the use of ITNs, with actions to promote implementation and sales with community participation. The development of LLINs and Global Fund financing has enabled development of this strategy on a large scale. Handling and washing of the ITNs by the population are other aspects of nets that have demanded specific information and educational actions. Recently the county has also strengthened the capacity for monitoring the residual effect of insecticides.

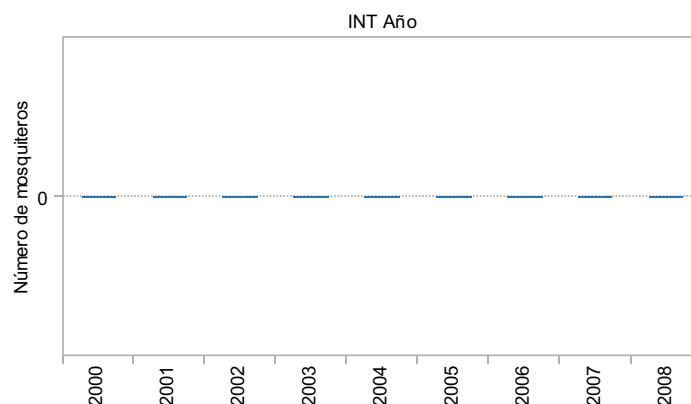
Cobertura de rociado residual intradomiciliar



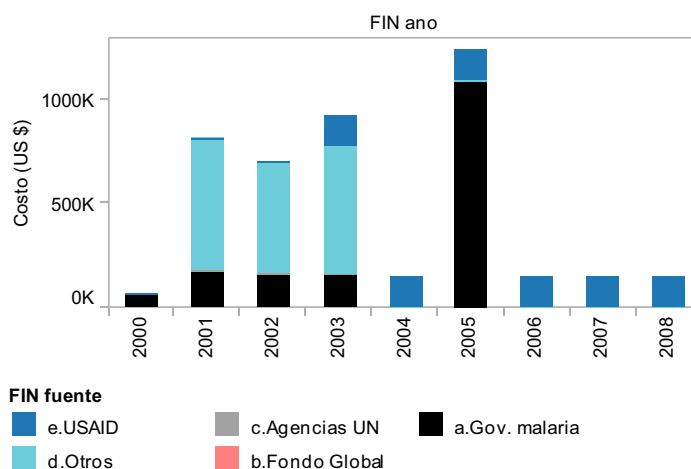
Cobertura con mosquiteros de larga duración



Cobertura con mosquiteros impregnados convencionales



Fuentes de financiamiento



Financing malaria control

In the past 4 years most of the funding for malaria control has been through the support of the Global Fund. In 2004 the country signed the first draft in the 4th round of proposals in GFR and in 2007 another project was accepted for further actions with emphasis on the mining population that contributes significantly to the perpetuation and maintenance of the endemic. USAID, through the AMI project coordinated by PAHO since 2002, has supported technical cooperation in various aspects of the monitoring program with enhancements that were included in Global Fund projects.