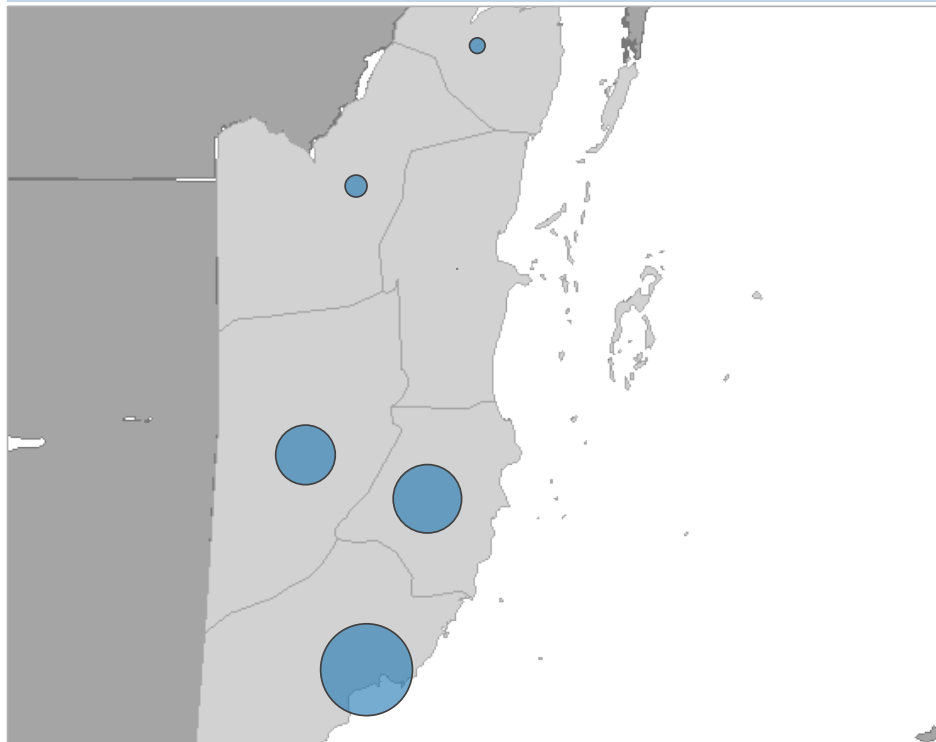


Belize

7

Figure 1. Number of cases by ADM 1 level. 2008



N° of malaria cases in 2008	538
P. falcip and mixed	0
P. vivax	538

Number of cases

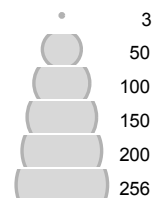


Figure 2. Proportion of cases by species

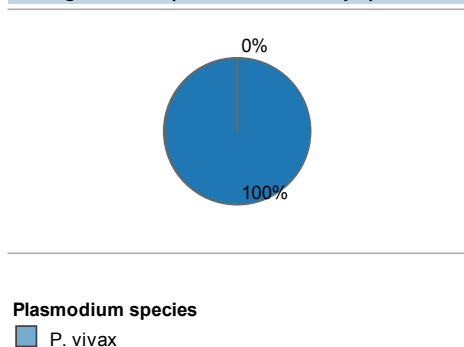
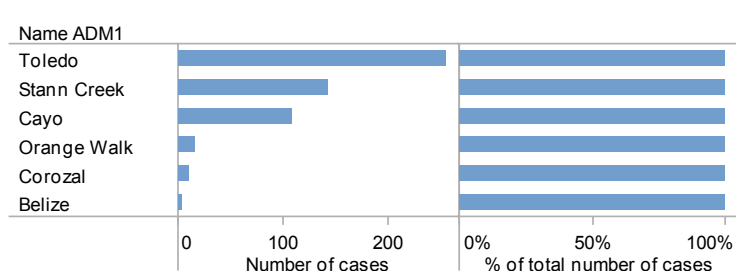


Figure 3. Number of malaria cases by species by ADM1 level in 2008

Name ADM1	Pfal+mixed	P. vivax	Total cases
Toledo	0	256	256
Stann Creek	0	143	143
Cayo	0	109	109
Orange Walk	0	17	17
Corozal	0	10	10
Belize	0	3	3



Overview of the malaria situation

Figures 1-5

Historical information on the incidence of Malaria in Belize shows the largest number of cases ever recorded in 1994 with a total of 10,400 cases. The last peak in malaria incidence in Belize was in 2005 with a total of 1,549 cases sharply decreasing last year (2008) to a total of 540 confirmed cases with no case of *P. falciparum* reported in Belize since 2006.

Malaria in Belize is particularly focalized in localities of the Southern and Western Districts (Toledo, Stann Creek and Cayo Districts) where a number of social and environmental factors influence the incidence: migratory movements and poverty levels.

Entomological studies have revealed the presence of at least three species of *Anopheles* mosquitoes in Belize. The primary vectors for malaria transmission: *An. albimanus*, *An. darlingi*, and *An. vestitipennis*. The behavior of these species of mosquitoes and the social / environmental factors mentioned previously can certainly explain the differences in the intensity of transmission.

Although the number of positive localities has been reduced even in the most affected Districts, the challenges to maintain the low number of cases are primarily: keeping a cadre of trained staff and maintain/improve the level of resources for the proper functioning of the program.

The reduction of infections by *P. falciparum* is congruent with similar phenomenon observed in neighboring countries like Guatemala and Nicaragua and although there is a closed relationship with Honduras, the reported areas with presence of *P. falciparum* in this neighboring country is more towards its border with Nicaragua than northerly towards Guatemala and Belize.

Trends in morbidity and mortality

Figures 4 - 11

Taking the year 2000 as baseline the reduction in incidence of *P. falciparum* has been of a 100% while for *P. vivax* has been of a 63%.

Malaria does not appear among the most frequent causes of hospitalization at national nor district level and apart from the malaria related death reported in 2006 there has been no more death linked or caused by malaria. The absence of infections caused by *P. falciparum* in the late years is certainly a positive influencing factor to consider regarding malaria deaths.

Scattering / focalization

Figures 1, 12-19

In 2008, 94.4 % of the country's malaria cases came from the districts of Toledo, Stann Creek and Cayo and within those districts 64.5% of the cases are reported from 11 communities.

Toledo alone is responsible for 47% of the cases in the country in 2008, and 56% of the cases are coming from 5 villages: Tambran, Indian Creek, Corazon, Crique Sarco and Punta Gorda Town.

Given its small population, Belize is the country with the highest malaria incidence in Central America, close to the incidence rates reported by Colombia and Brazil. The Toledo District incidence of 17 cases per 1000 inhabitants is similar to that of the neighboring Guatemalan towns but somewhat lower than in some Honduran locations as reported in 2008.

Malaria in special groups

Figures 25-28

In 2006 female infections were 46.3%, and during 2008 it was 43%. The morbidity among the age group of less than 15 years of age experienced a small reduction from 57.4% in 2007 to 53.3% in 2008 . The group of women between 15 to 44 years of age represented 15.2 % of the total malaria and although no data is available on the incidence of malaria among pregnant women, is not considered to be a

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Figure 4. Number of cases by specie 2000-2008

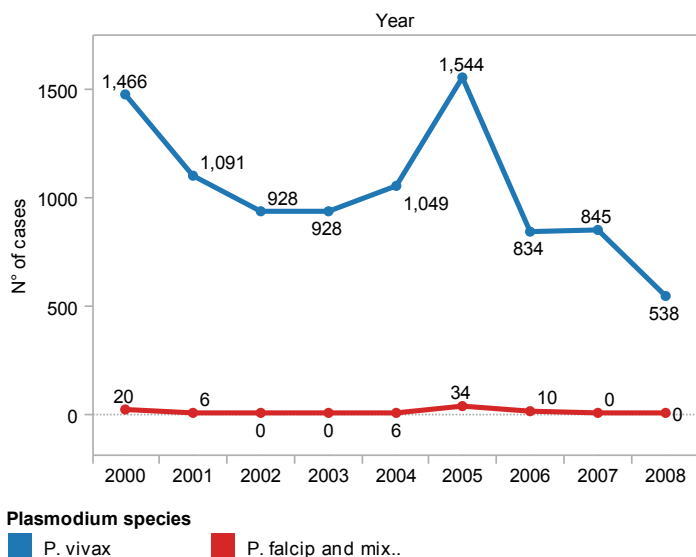


Figure 8. Annual variations in number of cases

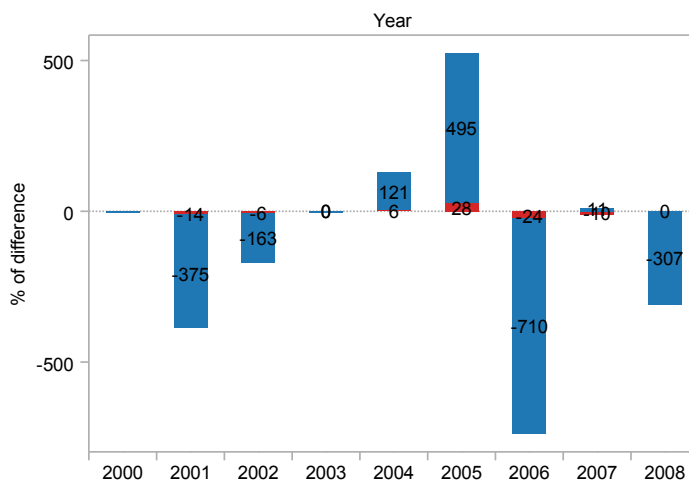


Figure 5. Number of malaria cases, 2000 - 2008

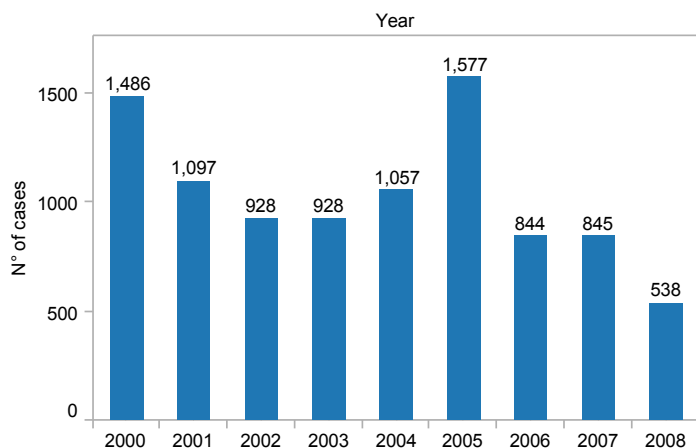


Figure 9. Difference (%) in number of cases with 2000

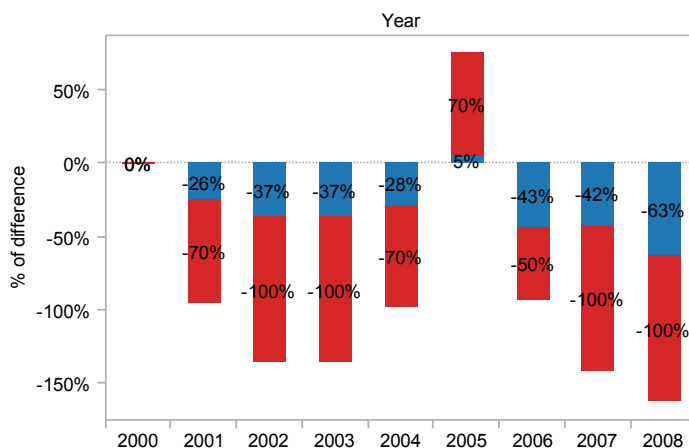


Figure 6. Number of malaria deaths 2000-2008

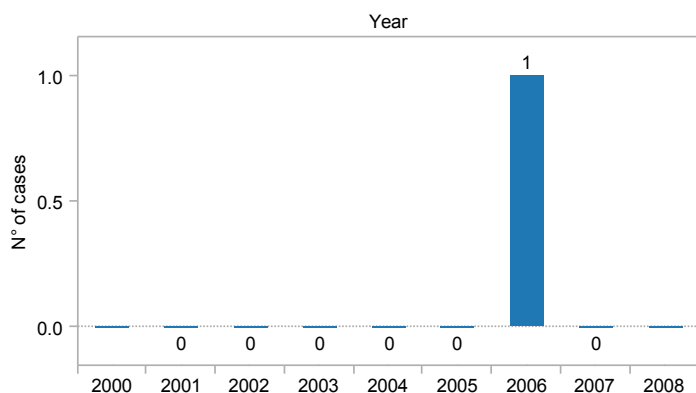


Figure 10. N° of cases and RBMI / MDG targets for 2010 and 2015

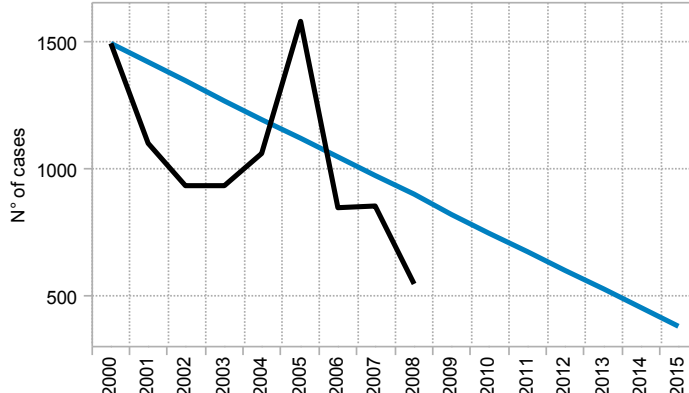


Figure 7. Number of hospitalized malaria cases, 2000 - 2008

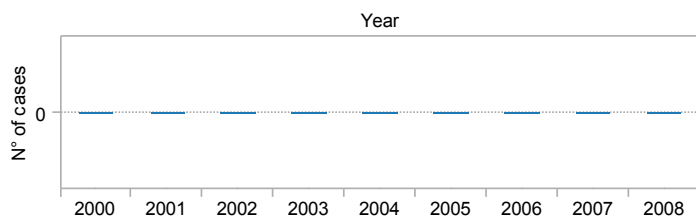
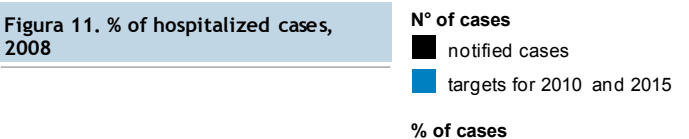


Figure 11. % of hospitalized cases, 2008



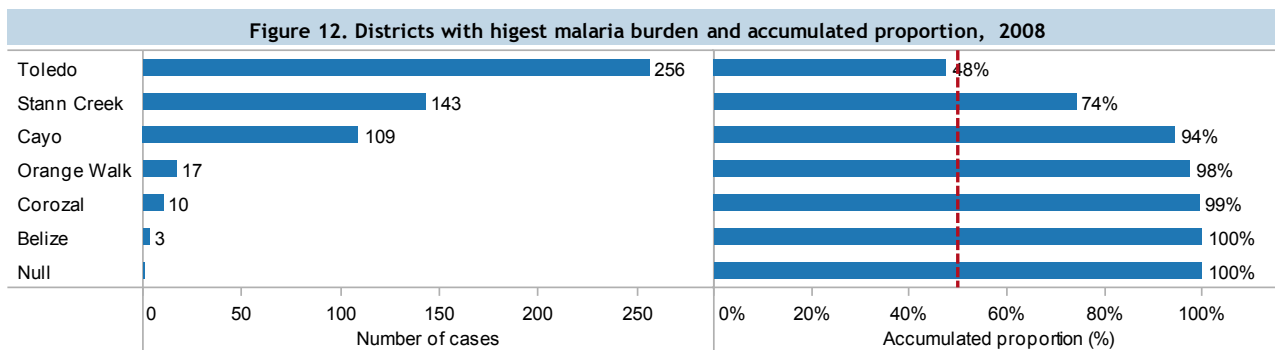


Figure 13. Districts by number of malaria cases

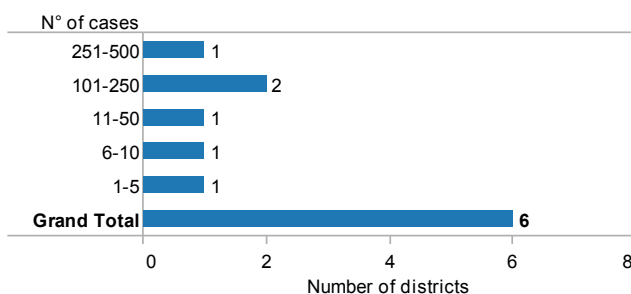


Figure 14. Districts by number of P. falciparum cases



Figure 15. Districts by N° of cases, API and % of P. falciparum

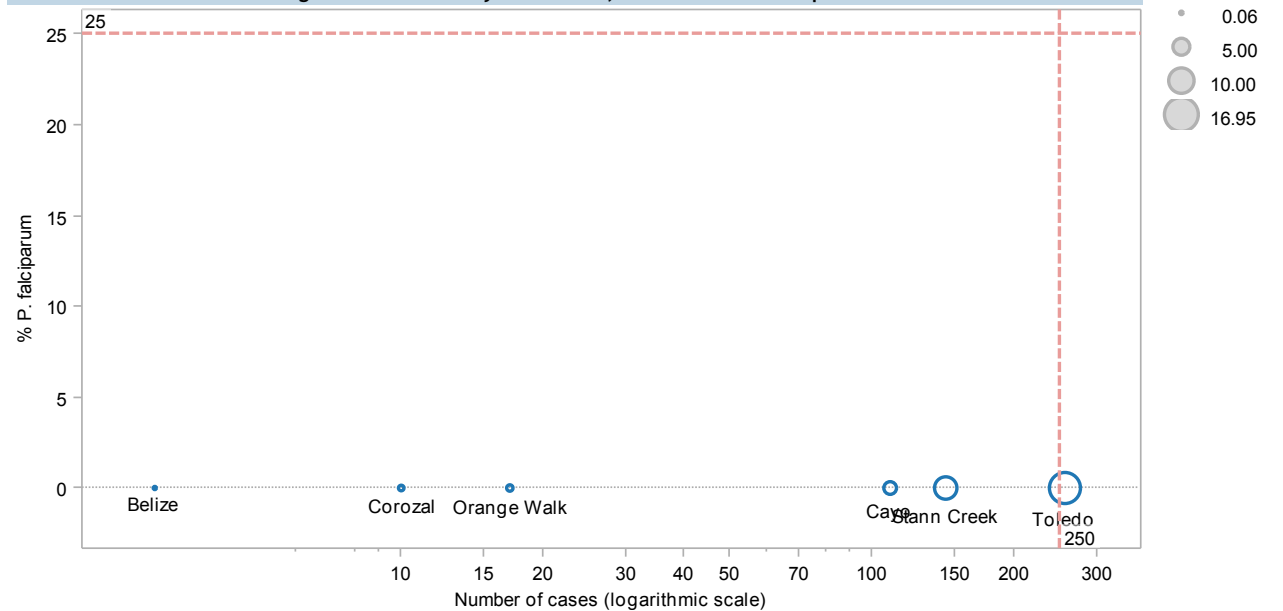


Figure 16. Annual incidence (API) by district, 2008

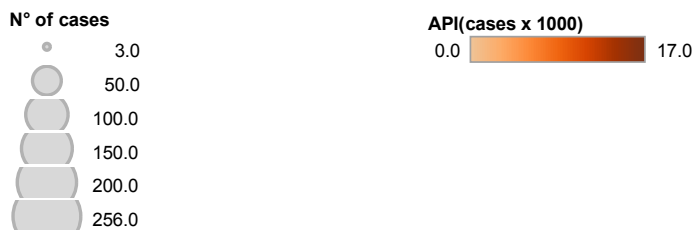
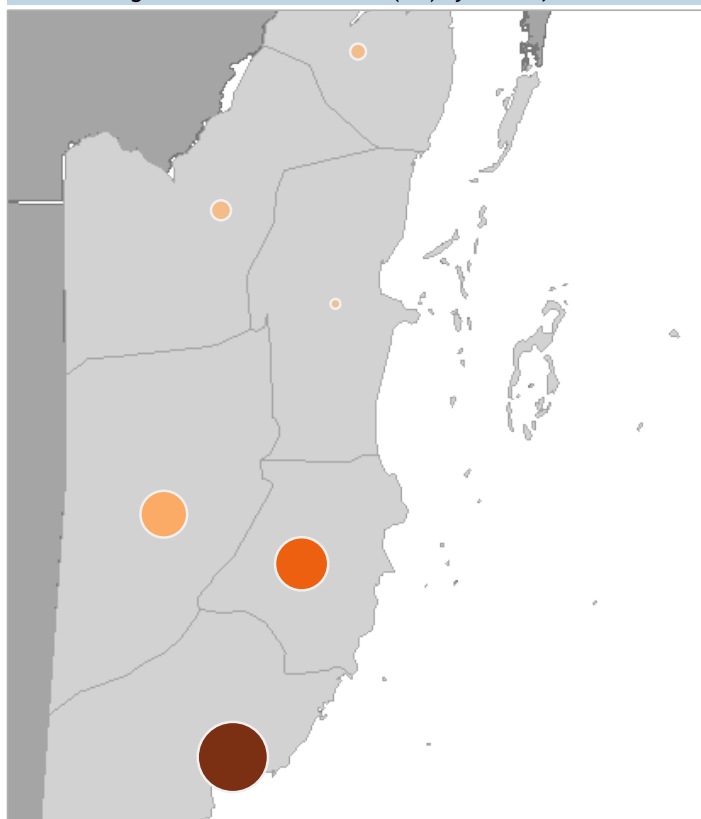


Figure 18. Annual incidence (API) and number of cases by district

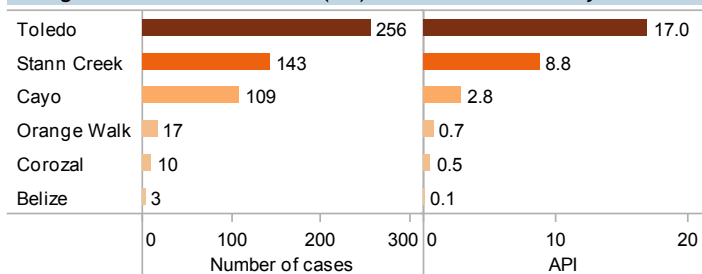
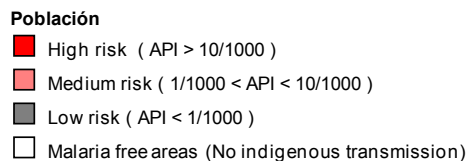
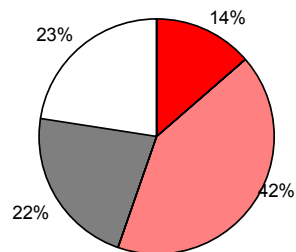


Figure 17. Population by malaria transmission risk

Year	High risk (API > 10/1000)	Medium risk (1/1000 < API < 10/1000)	Low risk (API < 1/1000)	Malaria free areas (No indigenous tra..)
2000	85,000	68,000	67,000	15,000
2001	0	153,000	0	97,000
2002	0	153,000	0	0
2003	0	153,000	0	97,000
2004	54,000	78,000	124,000	9,000
2005	54,000	61,000	142,000	0
2006	54,000	61,000	142,000	0
2007	63,403	71,497	176,600	0
2008	39,991	122,527	64,959	66,241

Figure 19. Population by malaria transmission risk



significant morbidity but it certainly warrants more close investigation and documentation.

No data is available about the existence or malaria urban transmission in Belize

Diagnosis and treatment

Figures 20-24, 29-30

The detection of cases in Belize is done by means of both active and passive surveillance. Passive surveillance refers to sampling all fever cases at the moment of consultation / contact with the health services at any level. Active surveillance is understood as the sampling of fever cases by malaria evaluators searching for febrile persons and/or during foci investigations. The objective is to maintain a testing level of 10% of the population per year. (ABER) Active case surveillance accounted for more than 40% of the slides tested in 2008. The SPR (Slide Positivity Rate) has decreased gradually from the beginning of the decade to a 2.1% while the Annual Parasitic Index (API) was 1.7 per 1000 in 2008.

The number of blood films (TBFs) made has remained steady in recent years despite the reduction in the number of cases with an initial tendency to increase active case detection than passive. At the districts level during 2008 important variations were observed in Slide Positivity Rate (SPR): ranging from 3.4 to 4.1 in the high incidence districts and 0.03 to 0.4 in low risk areas (Belize, Orange Walk and Corozal Districts)

The control program has relayed in the microscopic confirmation of TBFs (thick blood films) for the confirmation of malaria cases. There is one microscopist in every istrict with exemption of Orange Walk that sends its samples to be tested at the close neighboring district of Corozal.

Private sector regularly send TBFs taken at their facilities to be tested by control program microscopists and positive cases are given 14 days semi-supervised treatment just as is done with any other case detected in the Public Health System,

but in some areas self-medication represents a challenge for the program.

Prevention and vector control

Figures 31-33

The Vector Control Program of the Ministry of Health is responsible for control activities in the form of larviciding and spraying for adult mosquitoes: Indoor Residual Spraying (IRS) and space insecticide applications.

Over the years, the IRS has been reduced to the most positive localities for malaria. In 2008 approximately 47,000 people were protected by this measure. The focalized approach and utilization of insecticides during this period of reduction of the transmission is certainly in line with more effective and rational use of pesticides. It is noteworthy that case surveillance and early initiation of a 14 days semi-supervised treatment has been kept while efforts are underway to implement environmental actions following the DDT-GEF Project model.

Malaria control financing

Figure 34

In Belize, Vector Control staff deals with Malaria, Dengue and Chagas Disease (Integrated Vector Management) and is funded almost exclusively by Government. Annual vector control budget is approved and activities are implemented making it logistically difficult to differentiate expenses by disease of interest.

A rough estimate can be 50%, 40%, and 10% for Malaria, Dengue and Chagas disease/Administrative duties. The percentage of the Ministry of Health budget dedicated to Vector Control has been 0.7%, 0.9% and 0.8% for the years 2007, 2008 and 2009 respectively, notably less than 1% per annum.

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	Positives slides	% positive slides
2000	18,559	1,486	8.0
2001	18,173	1,097	6.0
2002	15,480	928	6.0
2003	15,480	928	6.0
2004	17,358	1,057	4.1
2005	25,119	1,577	6.1
2006	25,755	844	3.3
2007	22,134	845	3.8
2008	25,550	538	2.1

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

Name ADM1	Examined	Total cases	SPR (%)
Toledo	6,271	256	4.1
Stann Creek	3,990	143	3.6
Cayo	3,209	109	3.4
Orange Walk	3,809	17	0.4
Corozal	2,874	10	0.3
Belize	5,397	3	0.1

Figure 21. Cases diagnosed by microscopy and by RDT

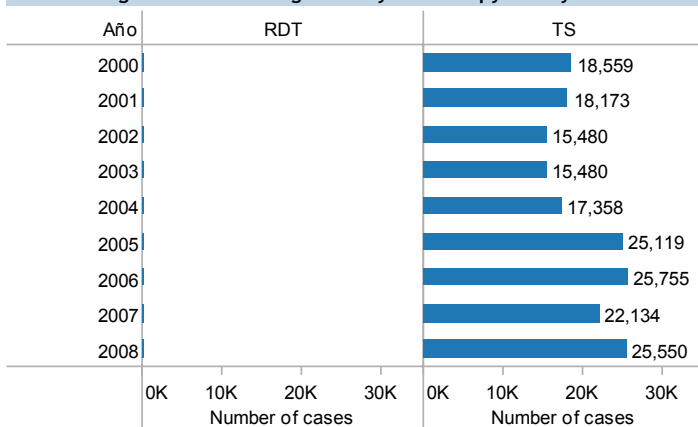


Figure 22. Confirmed cases vs distributed treatments , 2000-2008

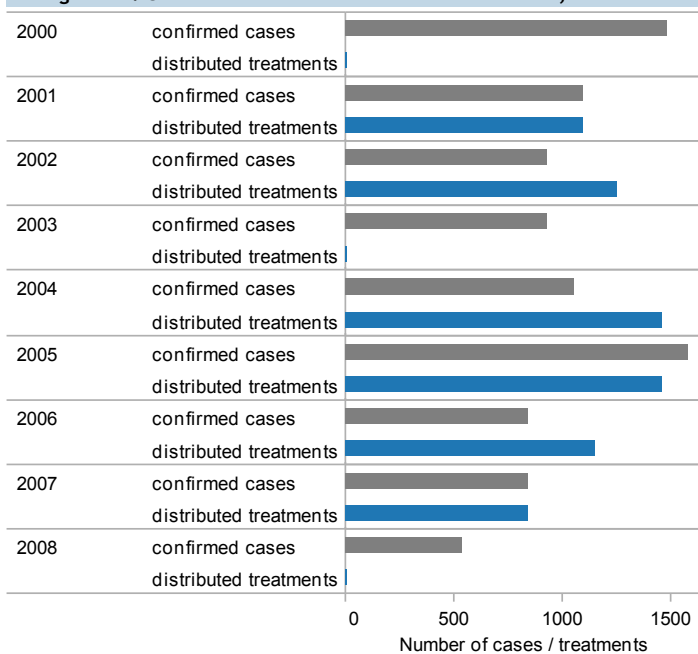
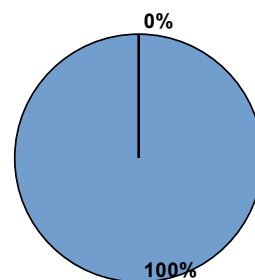


Figure 24. Time span between onset of symptoms and diagnosis



Time span between onset of symptoms and diagnosis (days)
■ > 72 hours
■ <72 hours

Figure 25. Number and % of cases by age group

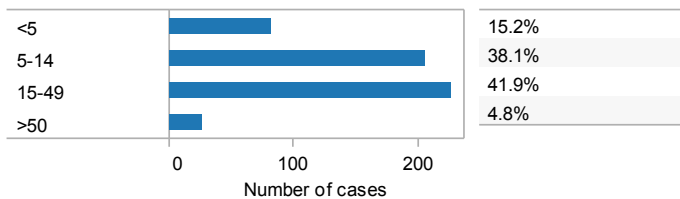


Figure 26. Number and % of cases by locality type

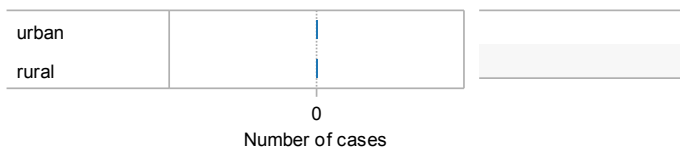


Figure 27. Number and % of cases in pregnant women

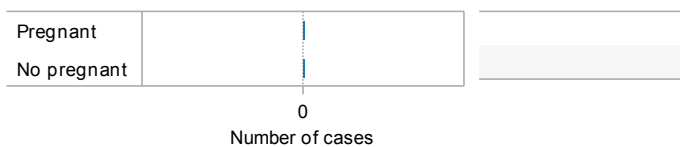


Figure 28. Number and % of cases in amerindian population

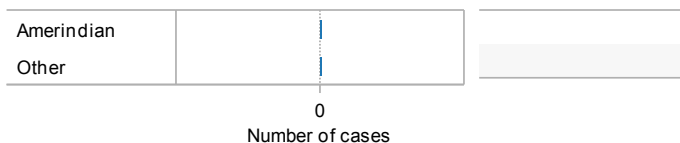


Figure 29. Proportion of P. falciparum cases, 2000-2008

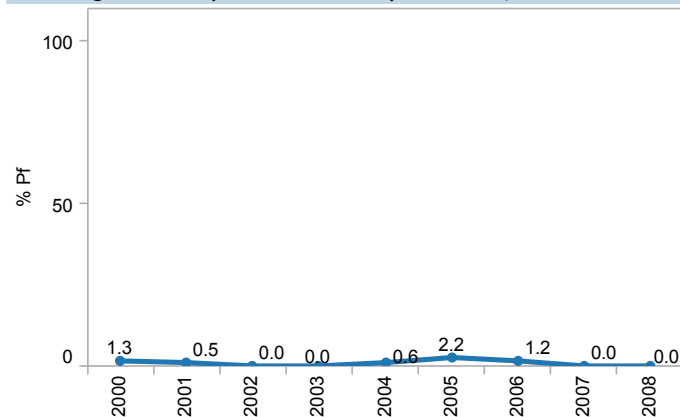


Figure 30. Number of ACT treatments distributed by year

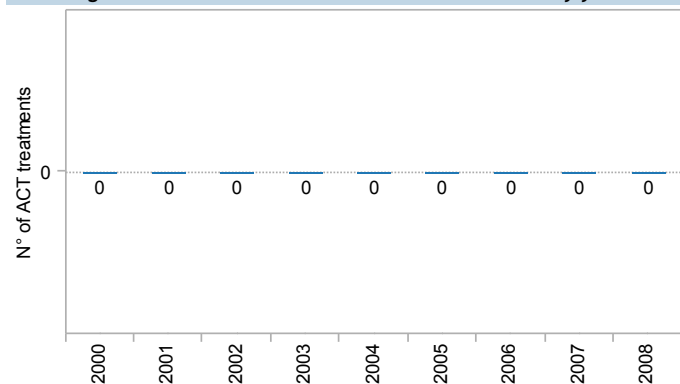


Figure 31. Indoor residual spraying coverage

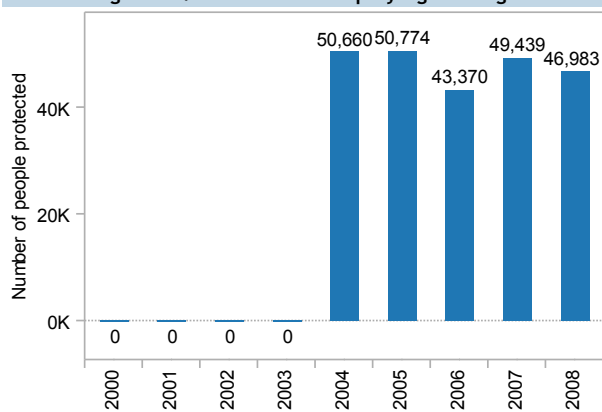


Figure 32. Long lasting impregnated net coverage

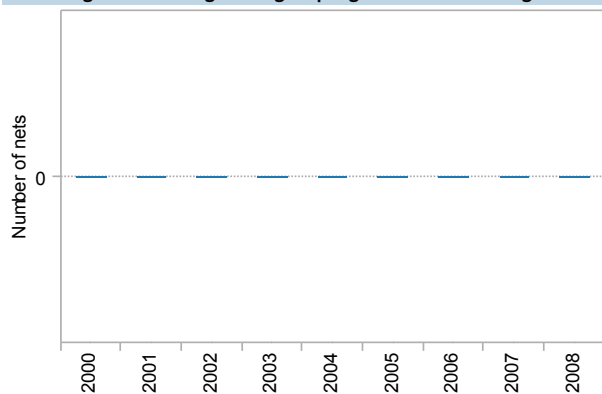


Figure 33. Conventional insecticide impregnated net coverage

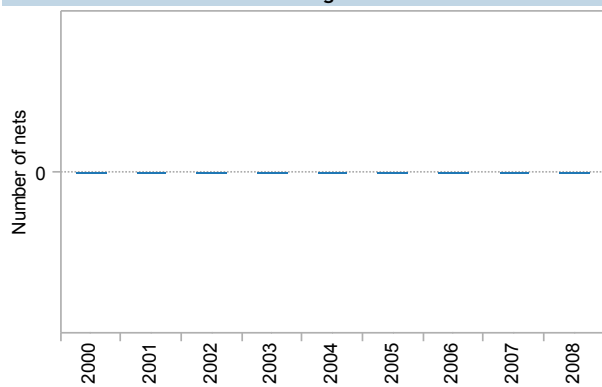
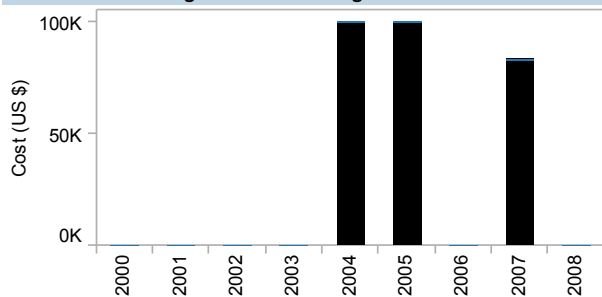


Figure 34. Financing sources



Financing sources

- USAID
- UN agencies
- Other bilateral fu..
- Global Fund
- Government