

Overview of the situation

Figures 1-5

In 2008, 744 cases of malaria were reported in Panama; of those, 740 were by *Plasmodium vivax* and four, by *P. falciparum*. Malaria transmission has been reduced dramatically since 2004 when 5,095 cases were reported, of which 882 were by *falciparum* cases. Despite its proximity to Colombia's most endemic area, Panama has an epidemiological pattern more similar to other Central American countries. In Panama, *P. vivax* malaria is more prevalent, and residual *P. falciparum* strains are chloroquine-sensitive.

In 2008, cases of malaria were reported from almost every province, but the main foci were in the provinces of Panama and Darien, where malaria most affects regions inhabited by indigenous populations. Living conditions in these communities, such as makeshift dwellings and frequent exposure to the vector for reasons related to their customs and way of life, are determinants of transmission. The main vector species is the *Anopheles albimanus* mosquito.

The country's proximity to Colombia's malaria-endemic Uraba and Pacific areas constitutes a risk factor, and migratory flows across the border contribute to the persistence of the endemic in the Province of Darien. The four *P. falciparum* cases reported in Panama were imported, three from Africa and one from the Republic of Colombia.

Morbidity and mortality trends

Figures 4 – 9

The number of malaria cases in the country started climbing in 2002, and peaked at 5,095 cases in 2004. Since then, the country has reported a noticeable drop in overall incidence and a decrease in the number of cases of *P. falciparum* malaria (four cases were reported in 2008). Between 2005 and 2006, the number of reported cases of *P. falciparum* fell from 766 to 62 a year.

The number of cases of *P. vivax* malaria fell by 25% between 2000 and 2008, while the number of cases by *P. falciparum* malaria dropped 91% in the same period. During the last decade, the number of deaths from malaria has remained between zero and three a year. In 2008 a single death from malaria was reported in a case of *P. falciparum* malaria imported from Africa.

Geographical distribution

Figures 1, 12-19

Of the 12,249 localities in Panama's endemic malaria area (up to 1,000 meters above sea level), currently 47% show active transmission. A total of 36 districts reported cases in 2008; however, 16 of those districts reported five or fewer cases. Only three districts reported more than 50 cases in the same year. The districts of Chepo, Pinogana and Baru, together reported 54% of the country's total number of cases.

In 2008, API in Panama was 0.2 cases per 1,000 people at risk, but it was 9.8 per 1,000 in the District of Pinogana. In addition to reporting the highest number of cases, the districts of Pinogana and Chepo have the highest risk of transmission in the country. The number of people at high or medium risk of transmission has declined since 2000.

Malaria in specific populations

Figures 25–28

Of countries in the Region, Panama and Belize report the largest percentage of cases among children under 15 years of age. In 2008, this age group accounted for 53% of reported cases. Among the same countries, Panama also reported the highest percentage (50%) of malaria cases among indigenous population. The figure is particularly significant because only about 10% of the population belongs to this ethnic group. The concentration of cases among the native inhabitants is also related to the high percentage of cases involving children under the age of 15 years, and the fact that 100% of the country's cases are of rural origin.

Unlike other countries in the Region, where there are occupational determinants of malaria transmission, transmission dynamics in Panama are linked to the household. Dwelling conditions and its surrounding environment facilitate malaria transmission.

In 2008, pregnant women accounted for 13% of malaria cases among women of childbearing age. Although the absolute numbers is only 13 cases, the proportion is higher than that reported by most countries, and could be indicative of better registration and reporting of malaria in pregnant women, who require special care.

Diagnosis and treatment

Figures 20-24, 29–30

The number of slides examined has remained stable since 2005, but the SPR has dropped significantly. The slide positivity rate in Panama in 2008 was 0.4%. Large numbers of slides were examined that same year even in provinces that reported few cases, such as Colon, Los Santos and Herrera. Active case detection is a strategy of the control program; in 2008, its coverage encompassed 328 areas, and led to the diagnosis of approximately 80% of the cases reported in the country. Case detection activities are the responsibility of inspectors who visit high-risk areas biweekly, monthly or bimonthly.

Passive detection contributed approximately 20% of all samples tested. This type of detection took place in 918 healthcare centers, including hospitals, health centers and health posts of the Ministry of Health, Social Security services, non-profit institutions, and as part of efforts by volunteer collaborators.

In spite of the fact that the intensity and coverage of active search are significant, in 2008, only 30% of the cases had access to diagnosis within 72 hours of the onset of symptoms. This is a smaller proportion than that in most countries that report this variable. The control program does not report the use of rapid diagnostic tests for malaria.

The first line of treatment for *P. vivax* malaria in Panama is chloroquine + primaquine administered in doses of 0.5 mg/kg/day for seven days. Chloroprimaquine tablets (150 mg chloroquine + 15 mg primaquine) are used. Cases of *P. falciparum* malaria are treated with sulfadoxine + pyrimethamine.

Prevention and vector control

Figures 31-33

IRS is still the main strategy used to interrupt transmission of malaria in Panama. During 2008, organophosphates were applied in the regions of Kuna Yala, Darien, Bocas del Toro, Veraguas, Ngobe Bugle, Cocle, Colon and east Panama. A total of 14,812 dwellings were sprayed three times that year. Breeding site control activities were also conducted through physical and biological control in selected localities.

Significant progress was made in 2008 under the DDT/GEF Project in eight demonstration localities in the regions of Bocas del Toro and Ngobe Bugle. The project included community

participation and environmental reorganization activities, along with other integrated methods for fighting malaria.

In 2008, the Malaria Program distributed 7,040 LLINs to prevent spread of the disease in high-risk localities.

Financing of malaria control

Figure 34

Financing for malaria control comes from the Ministry of Health's annual budget approved by the government, together with special loans and support provided by the Panamanian State. The budget for 2008 was 1.11% larger than that for the previous year.

Figure 1. Number of cases by ADM 2 level (municipality, district), 2008

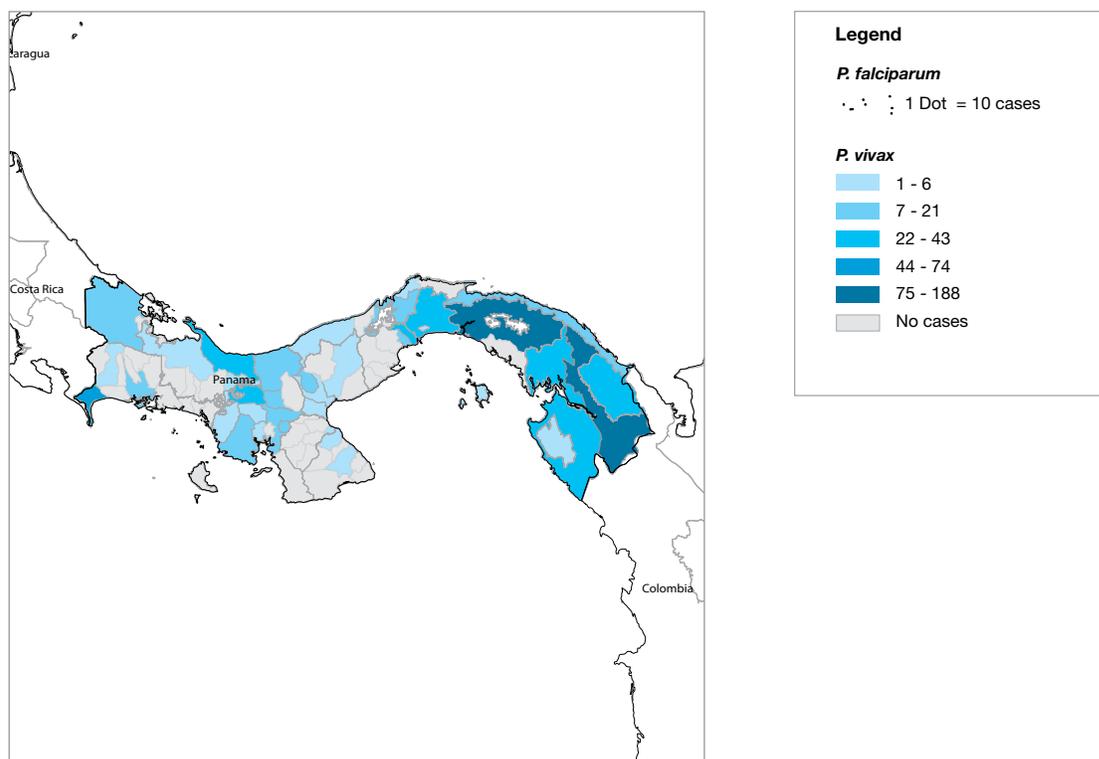
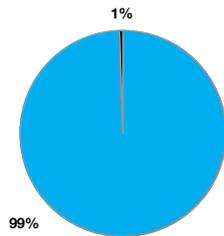


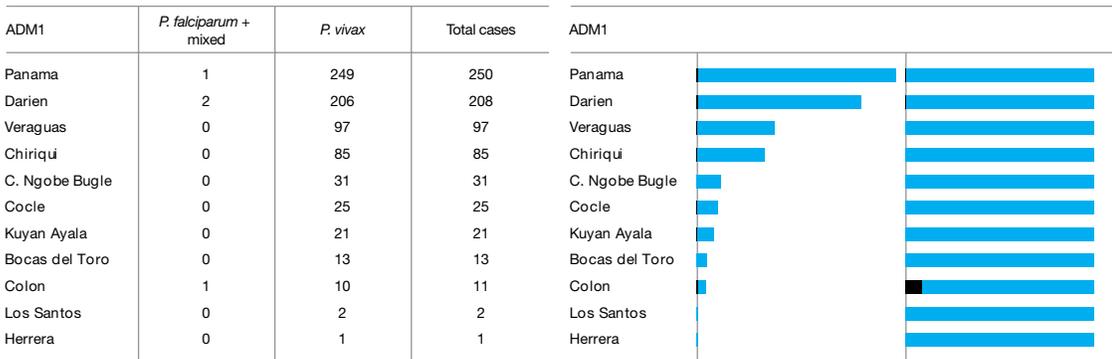
Figure 2. Proportion of cases by species, 2008



Plasmodium species

- *P. vivax*
- *P. falciparum* and mixed

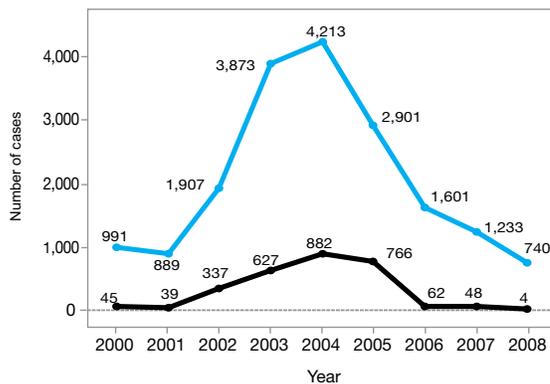
Figure 3. Number of malaria cases by species by ADM1 level in 2008



Plasmodium species

- *P. falciparum* and mixed
- *P. vivax*

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



Plasmodium species

- *P. falciparum* and mixed
- *P. vivax*

Figure 5. Number of malaria cases, 2000 - 2008

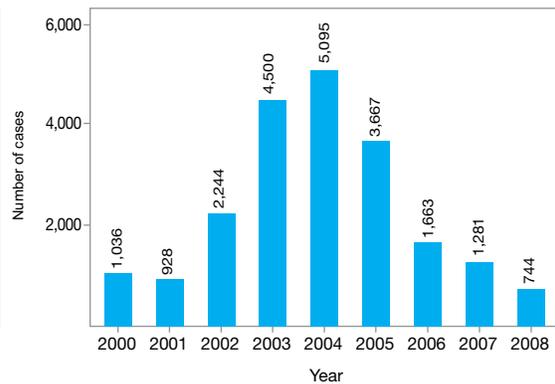


Figure 6. Number of malaria deaths, 2000-2008

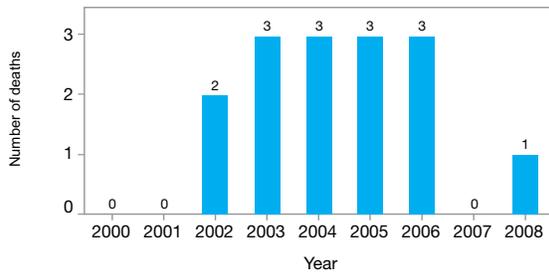


Figure 7. Number of hospitalized malaria cases, 2000 - 2008

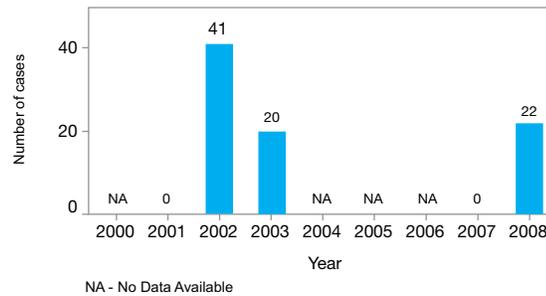
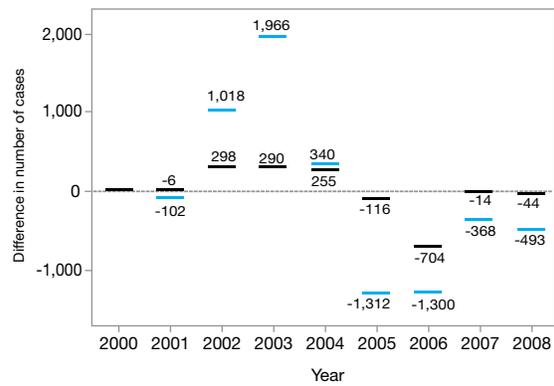
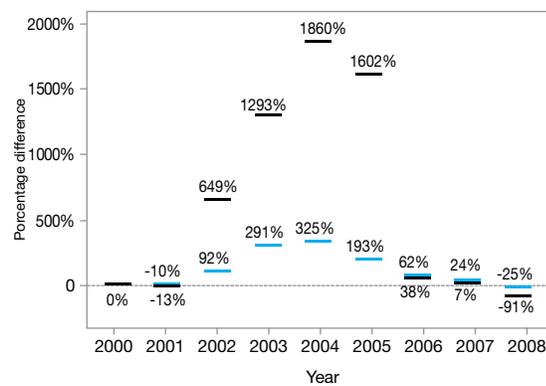


Figure 8. Annual variations in number of cases



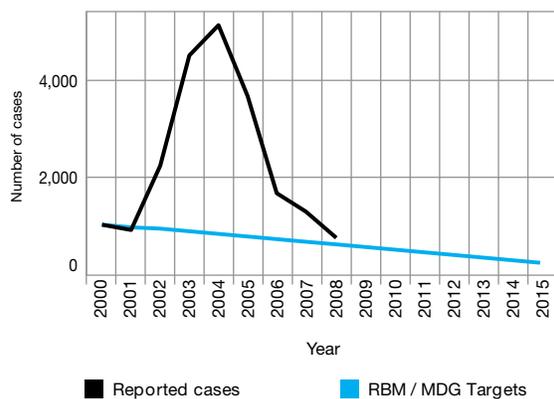
Plasmodium species
 ■ *P. falciparum* and mixed ■ *P. vivax*

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



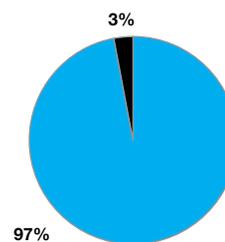
Plasmodium species
 ■ *P. falciparum* and mixed ■ *P. vivax*

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



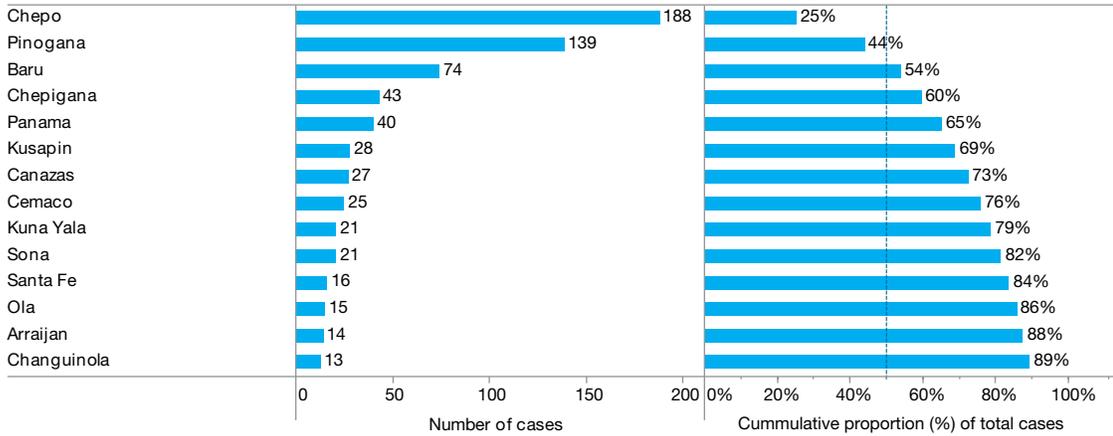
■ Reported cases ■ RBM / MDG Targets

Figure 11. Percentage of hospitalized cases, 2008



Percentage of cases
 ■ Outpatients
 ■ Hospitalized

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



* See Annex A for a complete list.

Figure 13. Districts (ADM2) by number of malaria cases, 2008

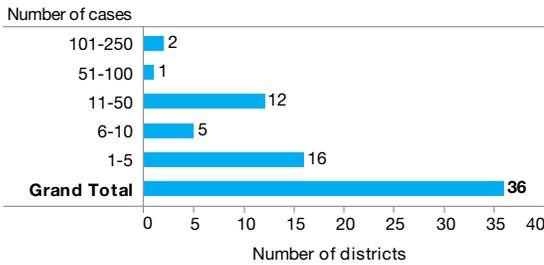


Figure 14. Districts (ADM2) by number of *P. falciparum* cases, 2008

No district reported cases of *P. falciparum* malaria in 2008

Figure 15. Districts (ADM2) by number of cases, API and percentage of *P. falciparum* cases, 2008

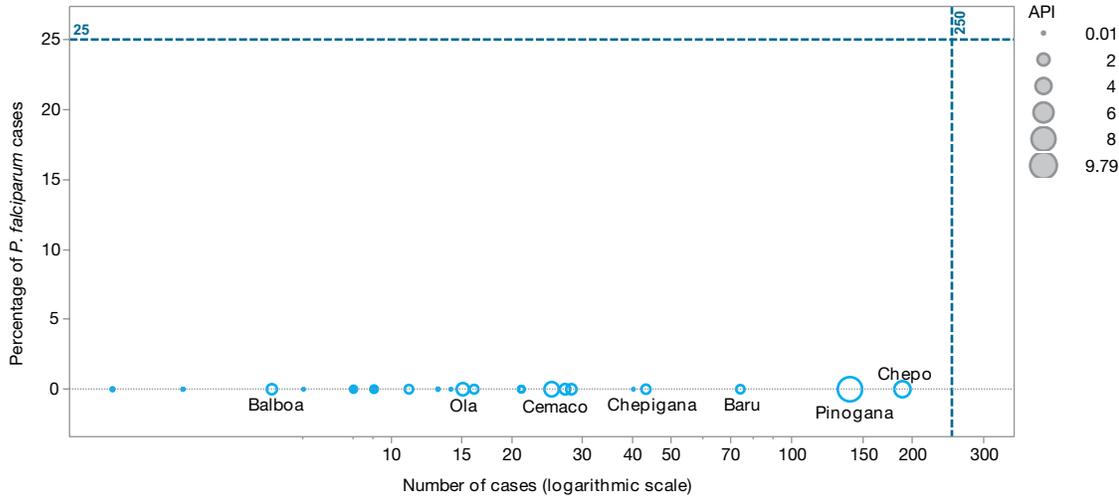


Figure 16. Annual Parasite Index (API) by districts (ADM2), 2008

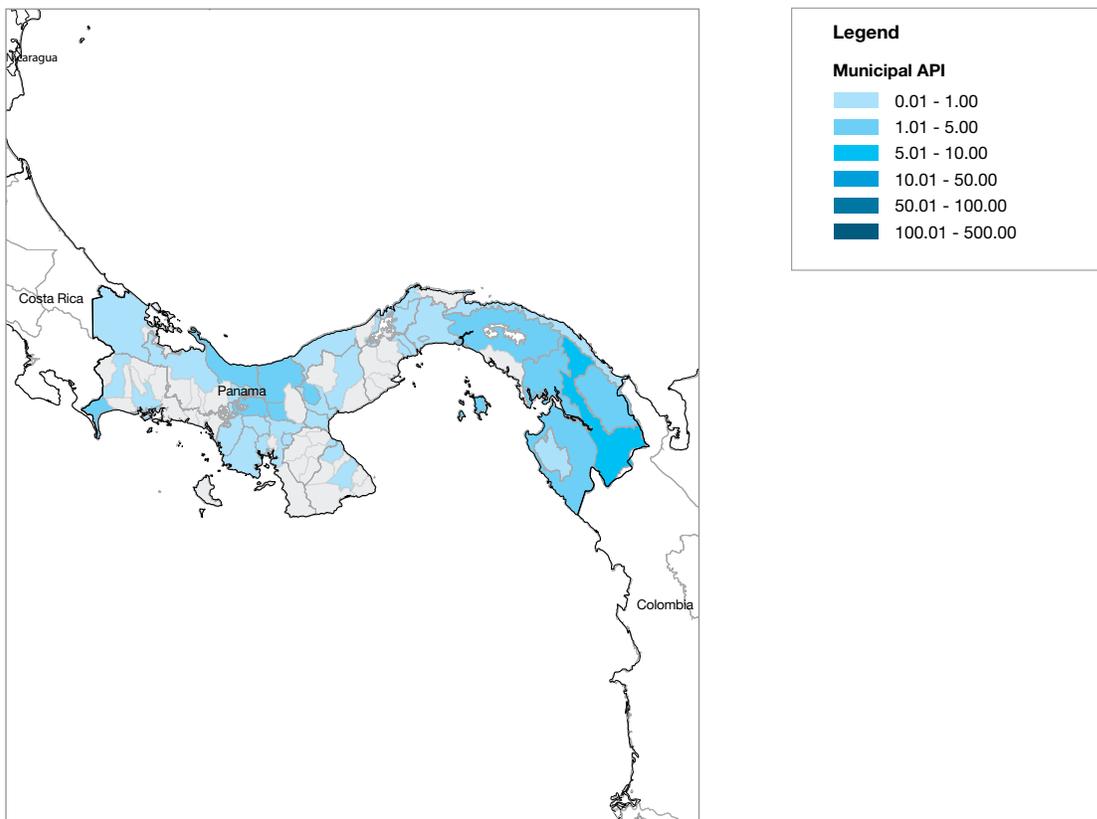
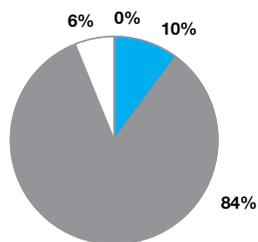


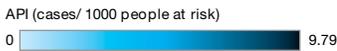
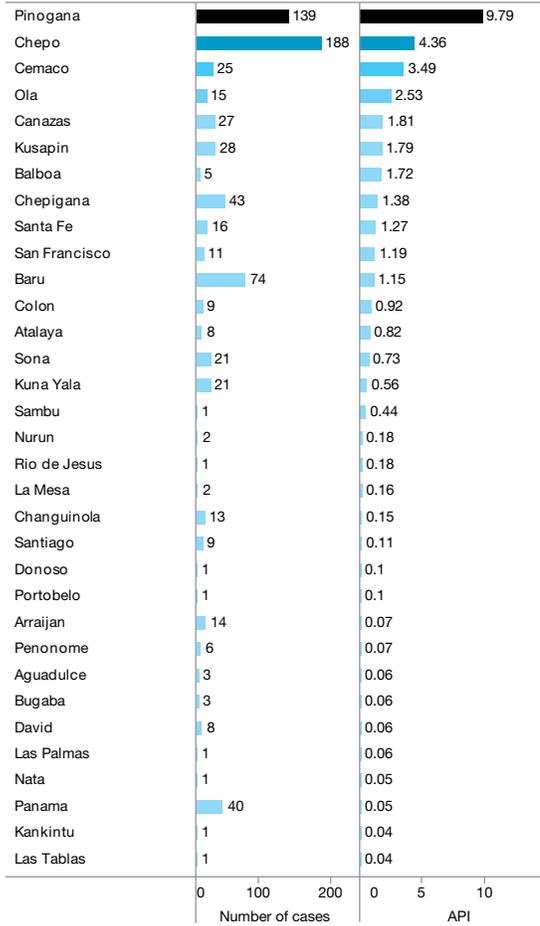
Figure 17. Population by malaria transmission risk, 2008



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



* See Annex A for a complete list.

Figure 21. Cases diagnosed by microscopy and RDTs, 2000-08

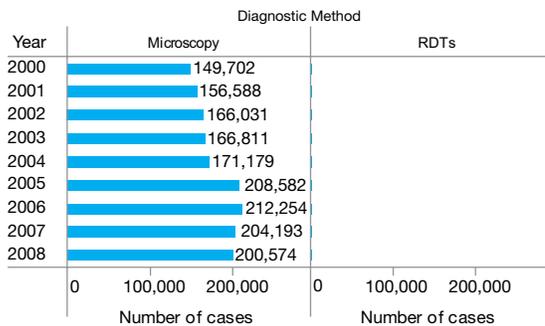


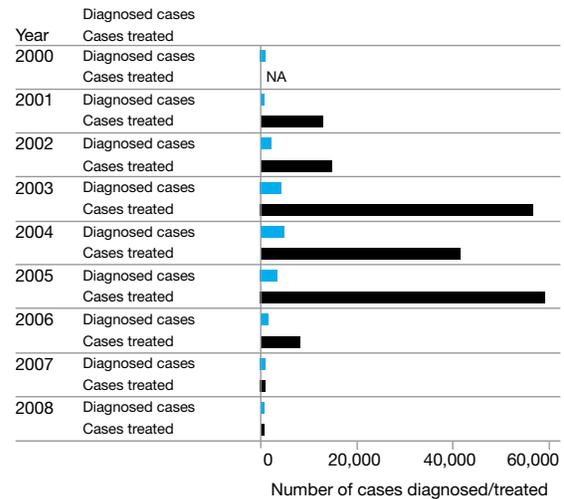
Figure 19. Population by malaria transmission risk, 2000-08

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	424,000	2,006,000	0	82,000
2001	391,000	2,430,000	0	98,000
2002	435,000	0	2,428,000	100,000
2003	497,000	368,000	2,256,000	105,000
2004	107,000	221,000	2,739,000	105,403
2005	107,000	221,000	2,250,000	91,546
2006	0	382,000	2,793,000	109,624
2007	0	0	3,228,357	111,424
2008	0	333,293	2,746,913	201,906

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

Year	Number of slides examined	Number of slides positive	Slide Positivity Rate (%)
2000	149,702	1,036	0.69
2001	156,588	928	0.59
2002	166,031	2,244	1.35
2003	166,811	4,500	2.7
2004	171,179	5,095	2.98
2005	208,582	3667	1.76
2006	212,254	1,663	0.78
2007	204,193	1,281	0.63
2008	200,574	744	0.37

Figure 22. Number of cases diagnosed and cases treated, 2000-2008

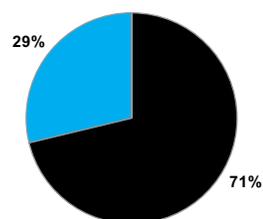


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Figure 23. Slide Positivity Rate (SPR) by ADM1, 2008

ADM1	Examined	Total cases	SPR (%)
Panama	33,093	250	0.76
Darien	38,213	208	0.54
Veraguas	21,947	97	0.44
Chiriquí	27,033	85	0.31
C. Ngobe Bugle	30,468	31	0.1
Cocle	5,434	25	0.46
Kuyan Ayala	10,263	21	0.2
Bocas del Toro	17,713	13	0.07
Colon	4,781	11	0.23
Los Santos	4,306	2	0.05
Herrera	1,692	1	0.06

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



Time span between onset of symptoms and diagnosis

■ >72 hours
■ <72 hours

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

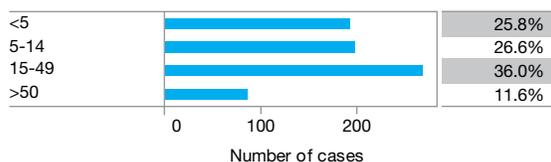


Figure 26. Number and percentage of cases by locality type, 2008

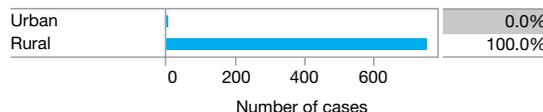


Figure 27. Number and percentage of cases in pregnant women among women of child bearing age, 2008

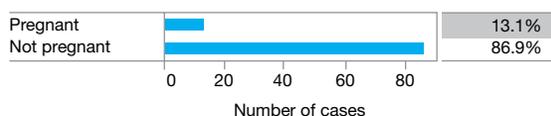


Figure 28. Number and percentage of cases in indigenous population, 2008

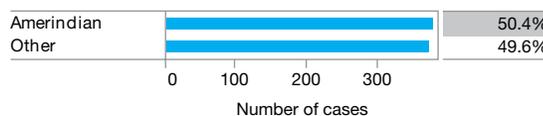


Figure 29. Proportion of *P. falciparum* cases, 2000-2008

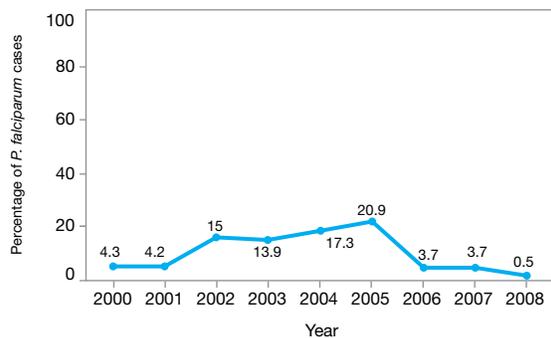


Figure 30. Number of ACT treatments distributed by year, 2000-08

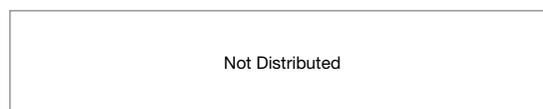


Figure 31. Indoor residual spraying coverage by year, 2000-08

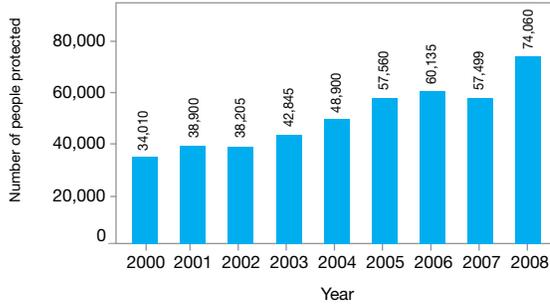


Figure 32. Number of LLINs distributed by year, 2000-2008



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

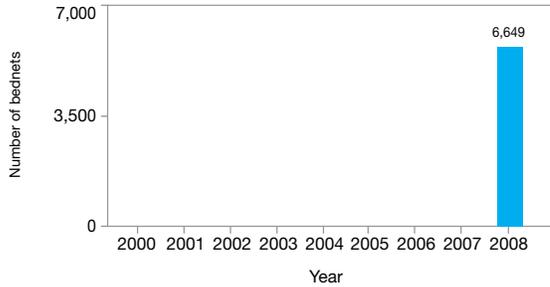
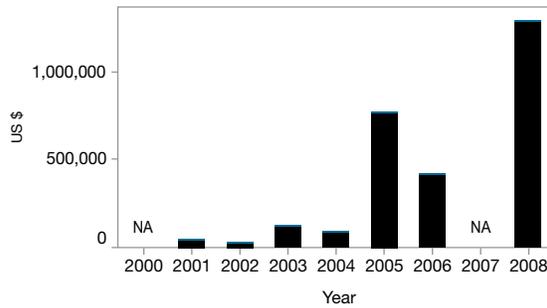


Figure 34. Sources for malaria control funds by year, 2000-08



Financing sources

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

NA - Data not available