5 | Colombia

Overview of the situation

Figures 1-5

Malaria is endemic in a large part of Colombia, which has the second highest burden of disease after Brazil. The eastern, central and western Andes in central Colombia, inhabited by people living at altitudes higher than 1,700 meters, are the only transmission-free regions. Conditions are favorable for malaria transmission in other parts of the country, but the foci of malaria transmission are areas where favorable environmental factors coexist with several social determinants. The principal vector species are *Anopheles albimanus*, *A. neivai* (Pacific), *A. pseudopunctipenis*, *A. nunestovari* (Orinoco and Amazon regions) and *A. darlingi* (Amazon). In recent years, municipalities on the Pacific coast and in the Lower Cauca (Departments of Antioquia and Cordoba) and Uraba regions (Antioquia Department) have borne the heaviest burden of disease, with an important malaria-endemic area being located in the Department of Guaviare, in a transition zone between the western plains and the Amazon.

A large proportion of *P. falciparum* malaria cases occur in the Pacific region and are associated with the predominating inhabitants of African origin. In 2008, 79,230 cases were reported, of which 22,392 (28%) were cases of *P. falciparum* malaria; this percentage is higher than in other Amazon countries, except for Guyana and Suriname. The distinguishing features of malaria in the Uraba region adjoining the Panamanian border are a predominance of *P. vivax* malaria cases and malaria endemic foci in some municipalities with a large number of cases and API of close to 100 cases per 1,000 inhabitants. On the Guajira Peninsula in northern Colombia, an endemic area near the spurs of the Santa Marta Mountains exists where outbreaks occur in the early months of the year. It was epidemiologically significant in 2008.

Morbidity and mortality trends

Figures 4 – 9

In 2008, Colombia recorded the lowest number of malaria cases in the past eight years. This can be attributed largely to a reduction of almost 50% in *P. vivax* malaria cases in the Department of Antioquia, together with a decline in malaria cases in the Pacific Departments of Narino and Choco. Mortality was lower in 2008 than in 2007 in Cordoba, the department where the two municipalities with the largest number of cases are located. However, there were problems in access to healthcare, particularly during the first half of the year. Difficult access to treatment can, according to the historical series, result in the underregistration of approximately 10,000 cases.

In 2007, when the Narino and Choco Departments adopted ACT use for *P. falciparum* malaria treatment, there was a countrywide reduction in *P. falciparum* malaria. At the same

time, however, cases of *P. vivax* malaria rose slightly. Malaria reduction in 2008 was similar for both *P. vivax* and *P. falciparum* cases. Deaths from malaria were also significantly lower in 2008 than the previous year.

Geographical distribution

Figures 1, 12-19

Endemic areas are not as marked in Colombia as in other countries of the region. The 10 municipalities with the largest number of cases do not account for even 50% of the country's malaria cases. Colombia's geographic and social characteristics are responsible for a large degree of dispersion in malaria endemic areas. Even so, systematic errors in reporting the place of origin of cases are thought to be responsible most likely for the large percent of dispersion noted in the data. In 2008, 462 municipalities were reported as the probable places of origin of malaria cases, but 228 of these had only 1 to 5 cases. Furthermore, 89 of these municipalities had 101 or more cases in 2008, making the gravity of the problem comparable to that of Brazil.

Although a large proportion of the cases of *P. falciparum* malaria occur in the Pacific region, it continues to be widely disseminated throughout all of the endemic zones in the country. In 2008, 38 municipalities reported more than 100 cases of *P. falciparum* malaria each and 12 others had over 500 registered cases. Municipalities like Tumaco in Nariño, El Bagre in Antioquia and Bajo Baudo in Choco, among others, should be given priority by the program because of their high API (>50/1,000), morbidity amounting to over 250 cases annually with over 25% of them being due to *P. falciparum*.

While the Departments of Antioquia and Cordoba experienced the highest burden of disease in 2008, it was those of Guaviare and Vichada where the incidence was highest, with API of between 40 and 60 per 1,000 inhabitants. However, heavy population mobility in these territories could lead to a considerable population that is possibly not duly included in the census used to determine rates, and could be influencing API. There were municipalities like Puerto Libertador (Lower Cauca region) and Bajo Baudo (Pacific) that registered API of over 120 cases per 1,000 inhabitants.

Malaria in specific populations

Figures 25–28

In 2008, 8.2% of the cases reported were among children under the age of 5, lower than that noted in most countries. This can possibly be attributed to the fact that a large proportion of the morbidity in Colombia is associated with activities in areas of conflict and illegal activities involving mainly young adults.

Although the information system does not yet reliably record the urban or rural origin of cases, 15.1% were registered in 2008 as of urban origin. Malaria transmission in the inner cities of several municipalities, where timely access to treatment is allegedly more viable, continues to be an important problem in Colombia and offers an opportunity to reduce morbidity substantially, particularly in zones with high percentages of *P. falciparum* malaria.

Only 2% of the women in childbearing age with malaria reported being pregnant when diagnosed; this constitutes an under-registration. Considering Colombia's general fertility rate, it should be higher than 5 pregnant women

per 100 women between the ages of 15 and 50 infected with malaria.

In Colombia, 3.3% of the population is considered indigenous. Native communities belonging to many ethnic groups inhabit Colombia's most malaria-prone zones, where the percentage of indigenous dwellers is much higher than in the rest of the country. In 2008, 8.7% of the malaria cases were reported as being among the native population.

Diagnosis and treatment

Figures 20-24, 29–30

In 2008, 447,627 slides were examined in suspected fever cases. The SPR was found to be significantly lower in 2008 than in previous years. Even so, it continues to be one of the highest in the region and the high SPR in some departments point to the need for a more active search for and surveillance of cases. It should be noted that the departments with the largest reductions in 2008 had lower SPRs (Antioquia, Narino). Low SPR in Buenaventura Municipality (Pacific), Department of Valle, where malaria transmission is highly focal, appears to be indicative of appropriate surveillance and early detection efforts.

In 2008, 66% of malaria cases were diagnosed within 72 hours of the onset of symptoms. Delayed initiation of treatment in a large percentage of cases is considered a determining factor in the perpetuation of transmission in several regions.

Use of RDTs for malaria increased significantly in Colombia in 2007 and 2008. The PAMAFRO project financed by the Global Fund helped acquire the RDTs used in 2008. Considering the existence of appropriate scenarios in Colombia for utilization of these RDTs, their use

in only 5% of the cases, compared with microscopy, appears to be too low. Better utilization of RDTs is expected in the next few years thanks to the support of a new project already approved by the Global Fund.

Colombia was the last country in the Amazon region to introduce ACTs for treatment of uncomplicated *P. falciparum* malaria. The ATM+LUM combination has been in use in the Pacific departments only since 2007. The reduction in number of cases has been sizeable in departments like Narino, Choco and Valle. In 2007, the percentage of *P. falciparum* malaria cases decreased sizably nationwide, apparently as a result of this treatment policy change in aforementioned departments. Although number of *P. falciparum* malaria cases decreased further in 2008, its proportion in total cases remained unchanged, perhaps because the reduction of *P. vivax* malaria was strong in Antioquia.

Prevention and vector control

Figures 31-33

IRS continues to be one of Colombia's control program strategies. More number of people were protected by IRS in 2008 than in 2007. In 2005, Colombia introduced the use of LLINs, which by 2008 had achieved wide coverage. The PAMAFRO project financed by the Global Program has helped fund implementation of LLINs and the new project approved in 2008 is expected to result in better coverage. AMI also contributed toward validating a strategy for better use and a greater impact from LLIN use. One year after LLIN were put into use, a marked reduction in malaria was documented in some Pacific localities (Choco), due in part to the new intervention.

Financing of malaria control

Figure 34

From 2006 to 2008, Colombia benefited from the PAMAFRO project financed by the Global Fund to control malaria in border areas with the other Andean countries. A new project was approved in 2008 that will concentrate efforts on more than 40 municipalities with the heaviest burden of disease in the country. Since 2002 USAID, through the AMI project, has been supporting activities to improve management of various malaria control program components.

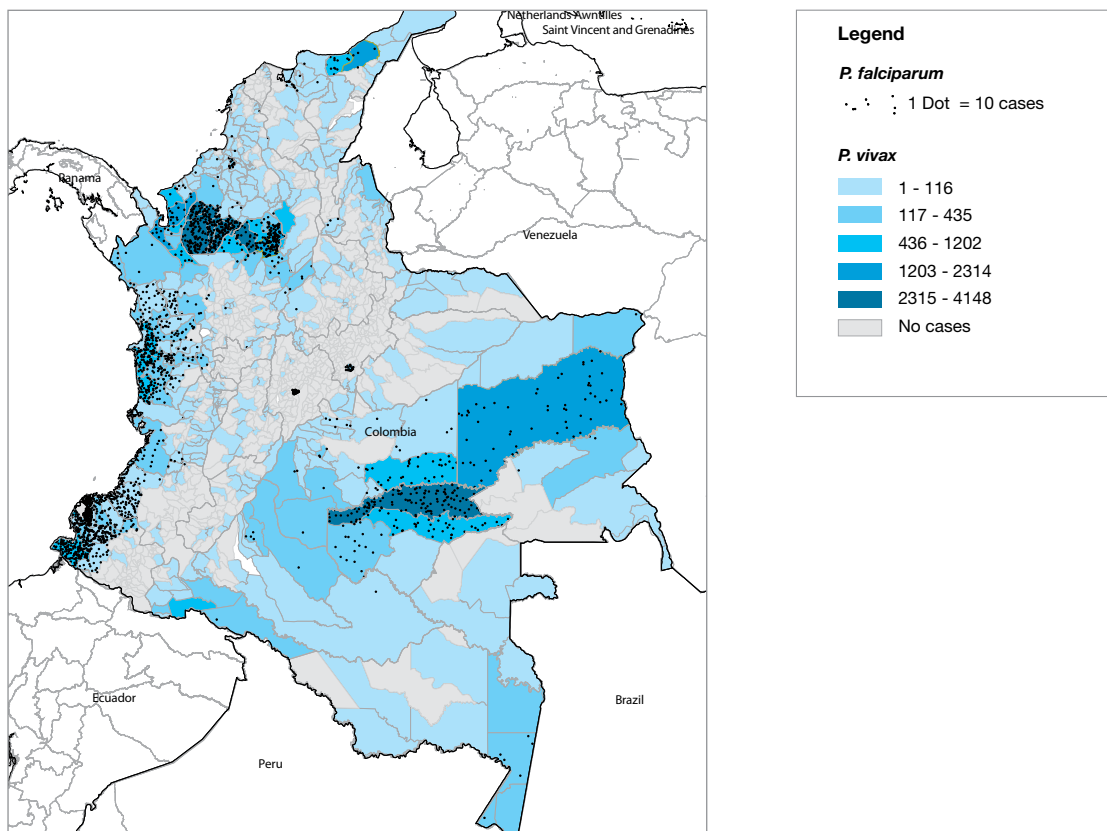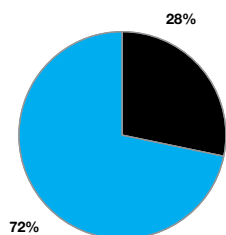**Figure 1. Number of cases by ADM 2 level (municipality, district), 2008**

Legend

P. falciparum

1 Dot = 10 cases

P. vivax

- 1 - 116
- 117 - 435
- 436 - 1202
- 1203 - 2314
- 2315 - 4148
- No cases

Figure 2. Proportion of cases by species, 2008

28%

72%

***Plasmodium* species**

■ *P. vivax*

■ *P. falciparum* and mixed

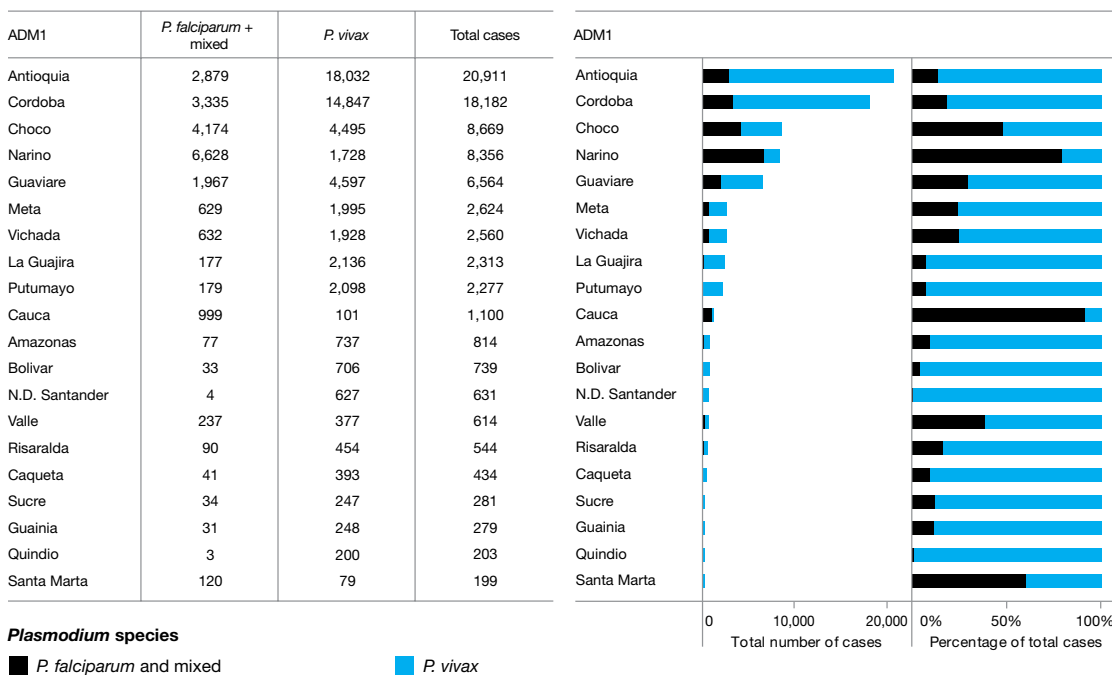**Figure 3. Number of malaria cases by species by ADM1 level in 2008**

ADM1	*P. falciparum* + mixed	*P. vivax*	Total cases
Antioquia	2,879	18,032	20,911
Cordoba	3,335	14,847	18,182
Choco	4,174	4,495	8,669
Narino	6,628	1,728	8,356
Guaviare	1,967	4,597	6,564
Meta	629	1,995	2,624
Vichada	632	1,928	2,560
La Guajira	177	2,136	2,313
Putumayo	179	2,098	2,277
Cauca	999	101	1,100
Amazonas	77	737	814
Bolivar	33	706	739
N.D. Santander	4	627	631
Valle	237	377	614
Risaralda	90	454	544
Caqueta	41	393	434
Sucre	34	247	281
Guainia	31	248	279
Quindio	3	200	203
Santa Marta	120	79	199

Total number of cases

Percentage of total cases

***Plasmodium* species**

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

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

Number of cases — Year

130,991
115,944
100,242
101,160
88,972
92,702
87,083
78,157
70,753
69,693
78,030
56,838
55,158
54,509
51,730
43,472
42,422
22,392

***Plasmodium* species**

■ *P. falciparum* and mixed   ■ *P. vivax*
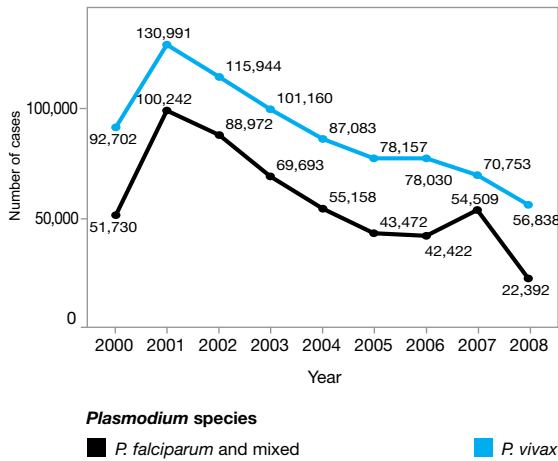
Figure 5. Number of malaria cases, 2000-2008

Number of cases — Year

144,432
231,233
204,916
170,853
142,241
121,629
120,452
125,262
79,230
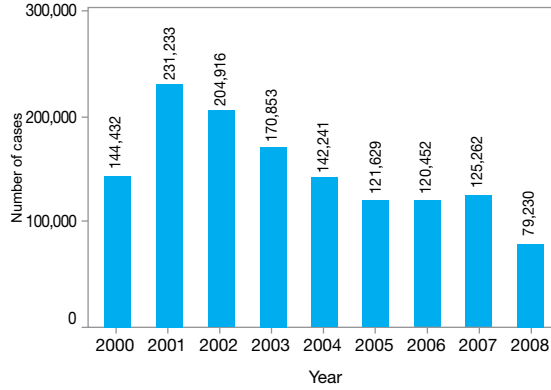
Figure 6. Number of malaria deaths, 2000-2008

Number of deaths — Year

41
58
40
24
25
28
53
19
22
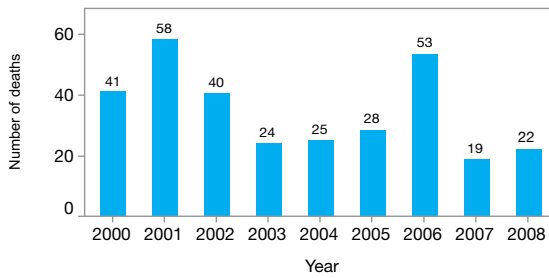
Figure 7. Number of hospitalized malaria cases, 2000 - 2008

Number of cases — Year

223

NA NA NA NA NA NA NA NA

NA - No Data Available
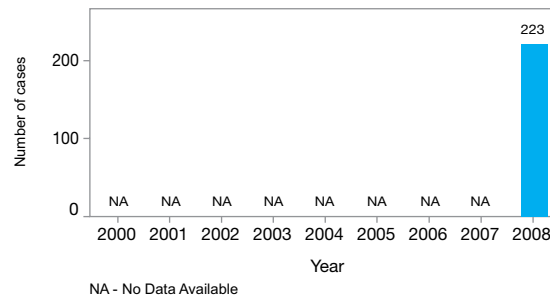
Figure 8. Annual variations in number of cases

Difference in number of cases — Year

48,512
38,289
12,087
-127
-1,050
-8,926
-11,270
-7,277
-14,784
-14,077
-15,047
-14,535
-11,686
-13,915
-19,279
-32,117

***Plasmodium* species**

■ *P. falciparum* and mixed   ■ *P. vivax*
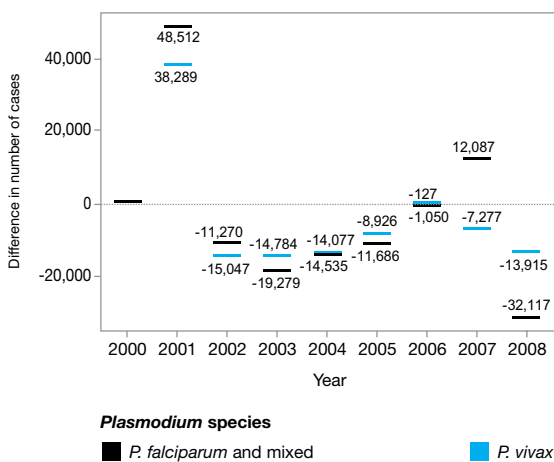
Figure 9. Percentage difference in number of cases compared to 2000

Percentage difference — Year

0%
94%
72%
41%
25%
35%
9%
7%
-6%
-16% -16%
-16% -18%
5%
-24%
-39%
-57%

***Plasmodium* species**

■ *P. falciparum* and mixed   ■ *P. vivax*
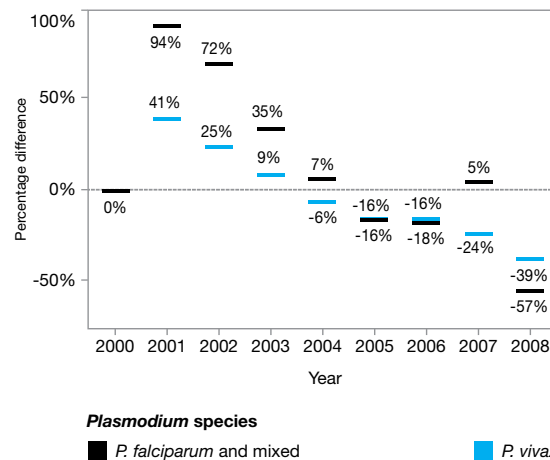
Figure 10. Number of cases and RBM / MDG targets for 2010 and 2015

Number of cases

Year

■ Reported cases   ■ RBM / MDG Targets

Figure 11. Percentage of hospitalized cases, 2008

0.3%

99.7%

Percentage of cases
■ Oupatients
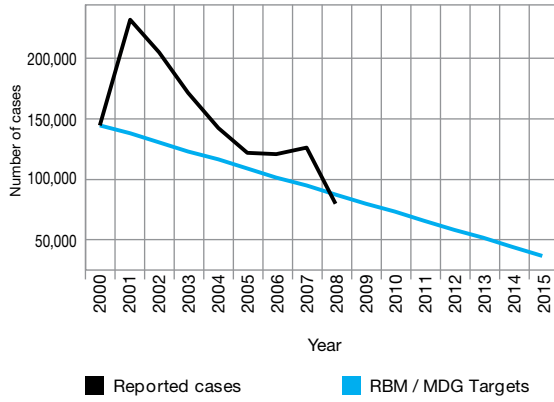■ Hospitalized

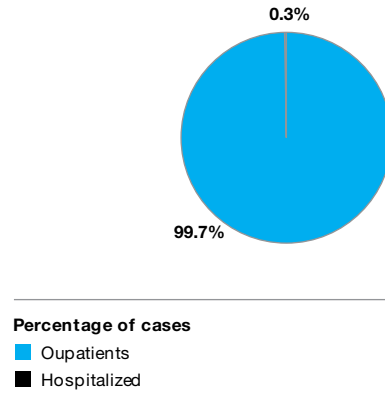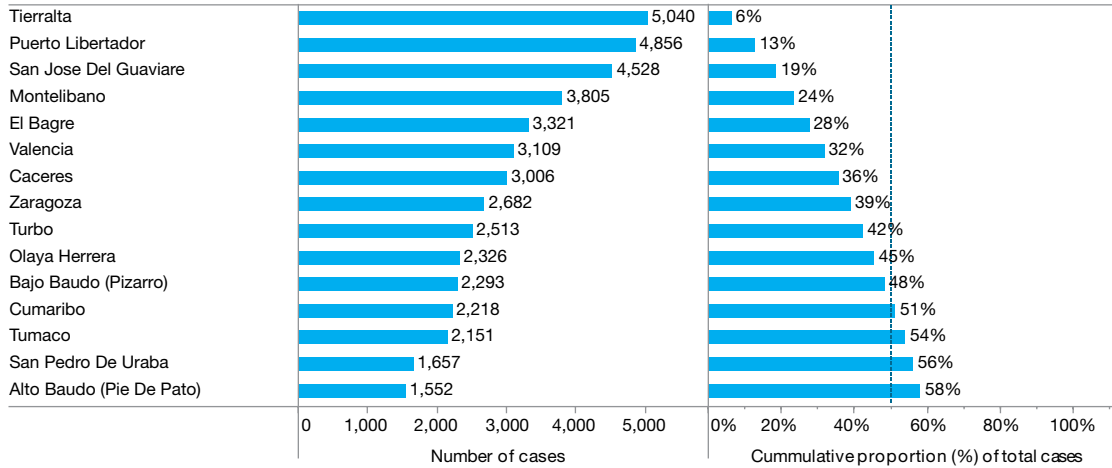**Figure 12. Districts with highest malaria burden and cummulative proportion of total cases in the country, 2008**

District	Number of cases	Cummulative proportion (%) of total cases
Tierralta	5,040	6%
Puerto Libertador	4,856	13%
San Jose Del Guaviare	4,528	19%
Montelibano	3,805	24%
El Bagre	3,321	28%
Valencia	3,109	32%
Caceres	3,006	36%
Zaragoza	2,682	39%
Turbo	2,513	42%
Olaya Herrera	2,326	45%
Bajo Baudo (Pizarro)	2,293	48%
Cumaribo	2,218	51%
Tumaco	2,151	54%
San Pedro De Uraba	1,657	56%
Alto Baudo (Pie De Pato)	1,552	58%

Number of cases

Cummulative proportion (%) of total cases

* See Annex A for a complete list.

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

Number of cases
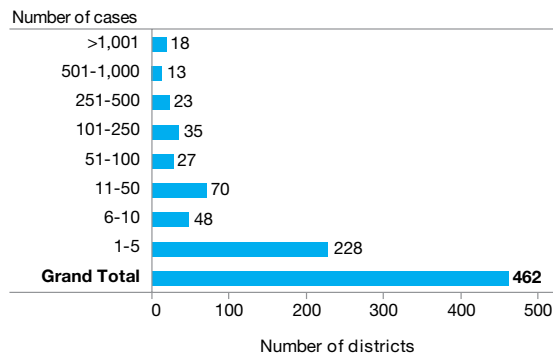
Range	Number of districts
>1,001	18
501-1,000	13
251-500	23
101-250	35
51-100	27
11-50	70
6-10	48
1-5	228
Grand Total	**462**

Number of districts

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

Number of
P. falciparum
cases

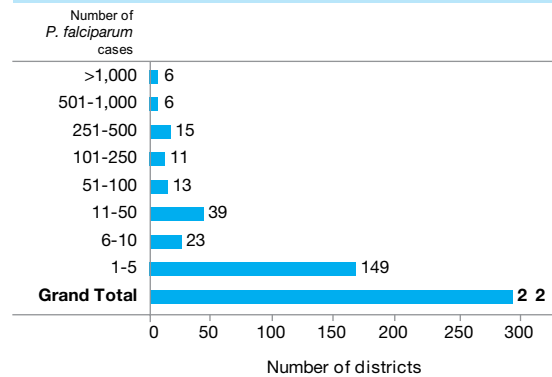| Range	Number of districts
>1,000	6
501-1,000	6
251-500	15
101-250	11
51-100	13
11-50	39
6-10	23
1-5	149
Grand Total	**2 2**

Number of districts

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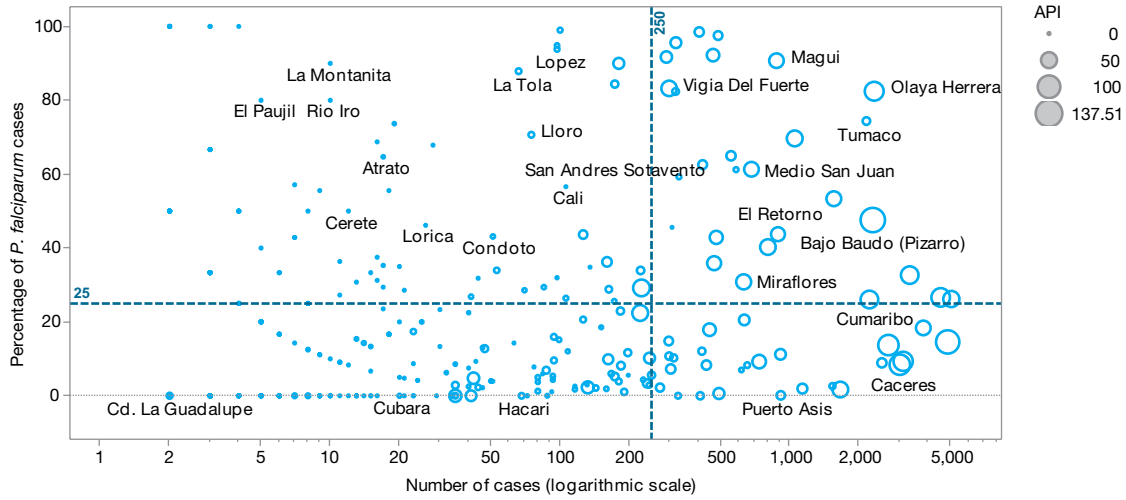

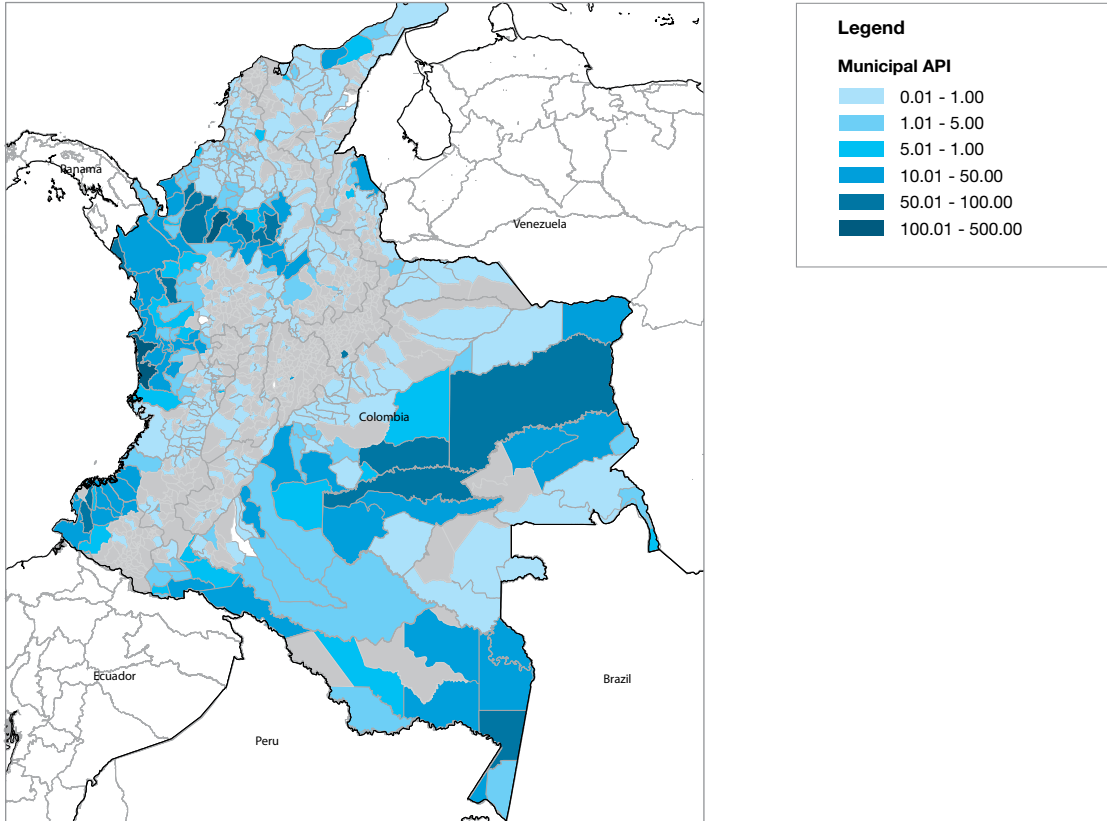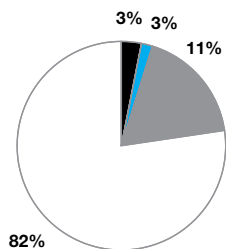**Figure 16. Annual Parasite Index (API) by districts (ADM2), 2008**

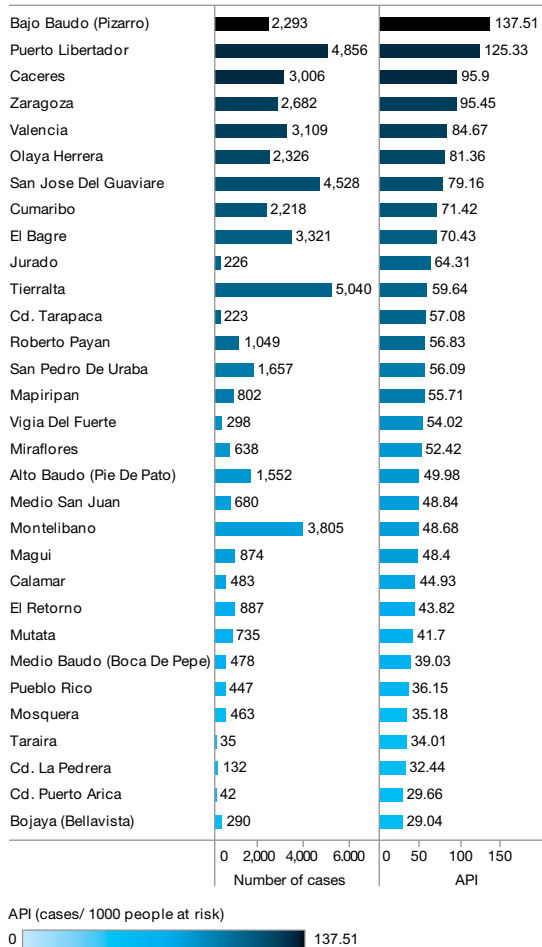## Figure 17. Population by malaria transmission risk, 2008

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

District	Number of cases	API
Bajo Baudo (Pizarro)	2,293	137.51
Puerto Libertador	4,856	125.33
Caceres	3,006	95.9
Zaragoza	2,682	95.45
Valencia	3,109	84.67
Olaya Herrera	2,326	81.36
San Jose Del Guaviare	4,528	79.16
Cumaribo	2,218	71.42
El Bagre	3,321	70.43
Jurado	226	64.31
Tierralta	5,040	59.64
Cd. Tarapaca	223	57.08
Roberto Payan	1,049	56.83
San Pedro De Uraba	1,657	56.09
Mapiripan	802	55.71
Vigia Del Fuerte	298	54.02
Miraflores	638	52.42
Alto Baudo (Pie De Pato)	1,552	49.98
Medio San Juan	680	48.84
Montelibano	3,805	48.68
Magui	874	48.4
Calamar	483	44.93
El Retorno	887	43.82
Mutata	735	41.7
Medio Baudo (Boca De Pepe)	478	39.03
Pueblo Rico	447	36.15
Mosquera	463	35.18
Taraira	35	34.01
Cd. La Pedrera	132	32.44
Cd. Puerto Arica	42	29.66
Bojaya (Bellavista)	290	29.04

API (cases/ 1000 people at risk)

0 ▬▬▬▬▬▬ 137.51

* See Annex A for a complete list

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	3,165,000	1,757,000	13,897,000	23,286,000
2001	4,900,000	831,000	16,750,000	21,353,000
2002	2,713,000	1,358,000	18,333,000	21,374,645
2003	2,185,000	1,278,000	4,821,000	37,041,000
2004	2,457,000	1,809,000	7,150,000	33,879,000
2005	2,128,000	2,045,000	4,312,000	35,382,336
2006	2,456,000	1,809,000	7,150,000	22,253,290
2007	1,942,104	1,429,604	3,987,449	14,790,843
2008	1,495,012	1,481,514	4,835,851	36,637,883

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

Year	Number of slides examined	Number of slides positive	Slide Positivity Rate (%)
2000	478,820	144,432	30.16
2001	747,079	231,233	30.95
2002	686,635	204,916	29.84
2003	640,453	170,853	26.68
2004	562,681	142,241	25.28
2005	493,562	121,629	24.64
2006	451,240	120,452	26.69
2007	564,755	125,262	22.18
2008	447,627	79,230	17.7

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

Diagnostic Method

Year	Microscopy	RDTs
2000	478,820	
2001	747,079	
2002	686,635	
2003	640,453	
2004	562,681	
2005	493,562	
2006	451,240	
2007	564,755	25,000
2008	447,627	22,754
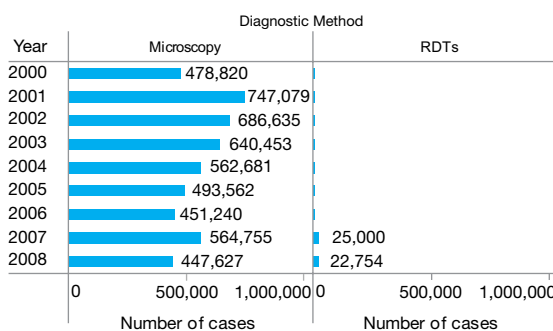
Figure 22. Number of cases diagnosed and cases treated, 2000-2008

Year	
	Diagnosed cases
	Cases treated
2000	Diagnosed cases
	Cases treated — NA
2001	Diagnosed cases
	Cases treated
2002	Diagnosed cases
	Cases treated
2003	Diagnosed cases
	Cases treated
2004	Diagnosed cases
	Cases treated
2005	Diagnosed cases
	Cases treated — NA
2006	Diagnosed cases
	Cases treated
2007	Diagnosed cases
	Cases treated
2008	Diagnosed cases
	Cases treated

Number of cases diagnosed/treated (0, 100,000, 200,000)

NA- No Data Available

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

ADM1	Examined	Total cases	SPR (%)
Antioquia	112,246	20,911	18.63
Cordoba	57,636	18,182	31.55
Choco	41,422	8,669	20.93
Narino	74,232	8,356	11.26
Guaviare	11,221	6,564	58.5
Meta	55,653	2,624	4.71
Vichada	4,654	2,560	55.01
La Guajira	34,261	2,313	6.75
Putumayo	23,875	2,277	9.54
Cauca	2,065	1,100	53.28
Amazonas	1,766	814	46.08
Bolivar	4,065	739	18.18
N.D. Santander	16,786	631	3.76
Valle	9,541	614	6.44
Risaralda	3,020	544	18.01
Caqueta	7,858	434	5.52
Sucre	853	281	32.95
Guainia	961	279	29.04
Quindio	1,473	203	13.78
Santa Marta	---	199	0
Santander	701	112	15.98
Magdalena	656	105	16
Barranquilla	---	92	0
Tolima	373	65	17.4
Boyaca	571	58	10.15
Cundinamarca	332	53	15.98
Huila	230	52	22.65
Casanare	219	35	15.99
Cartagena	---	30	0
Atlantico	154	29	18.87
Cesar	244	28	11.49
Caldas	76	19	24.85
Bogota D.C.	0	0	0
San Andres	---	0	0

---Data not available

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

34%

66%
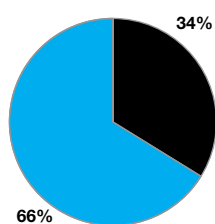
Time span between onset of symptoms and diagnosis

■ >72 hours
■ <72 hours

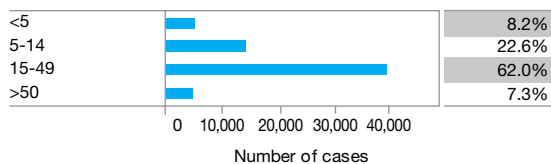## Figure 25. Number and percentage of cases by age group, 2008

Age group		Percentage
<5		8.2%
5-14		22.6%
15-49		62.0%
>50		7.3%

Number of cases (0, 10,000, 20,000, 30,000, 40,000)

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

Locality		Percentage
Urban		2.0%
Rural		98.0%

Number of cases (0, 20,000, 40,000, 60,000)

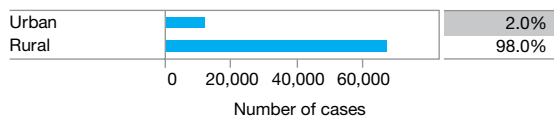## Figure 27. Number and percentage of cases in pregnant women among women of child bearing age, 2008

		Percentage
Pregnant		15.1%
Not pregnant		84.9%

Number of cases (0, 5,000, 10,000, 15,000)
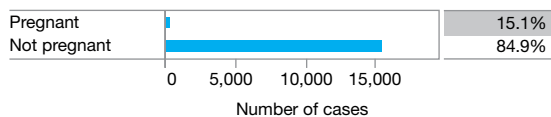
**Figure 28. Number and percentage of cases
in indigenous population, 2008**

Amerindian — 8.7%
Other — 91.3%
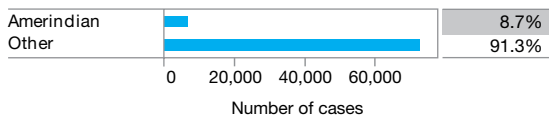
Number of cases

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

35.8 43.4 43.4 40.8 38.8 35.7 35.2 43.5 28.3
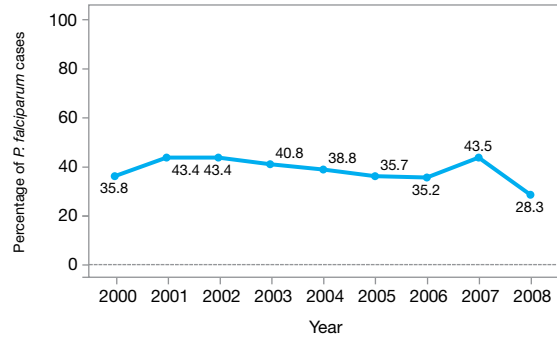
**Figure 30. Number of ACT treatments
distributed by year, 2000-08**

51,840 33,240 46,350
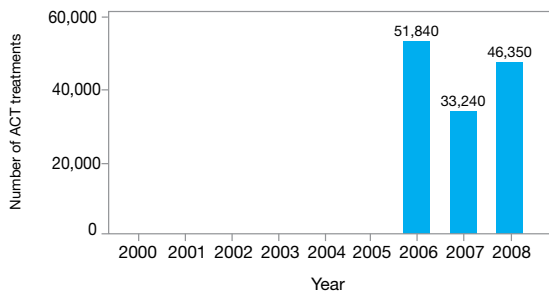
**Figure 31. Indoor residual spraying
coverage by year, 2000-08**

143,640 211,294
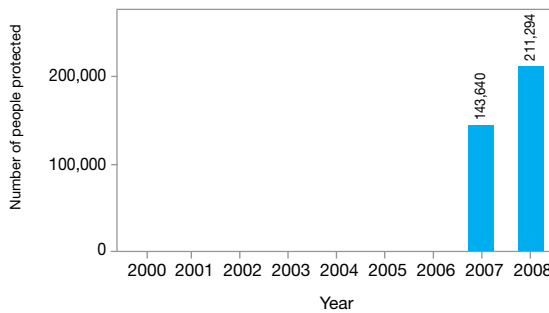
Figure 32. Number of LLINs distributed by year, 2000-2008

20,000 8,360 87,394 105,759
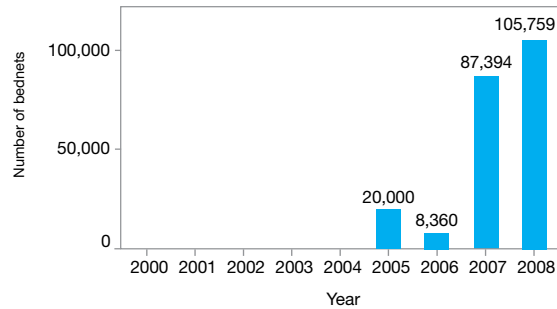
Figure 33. Number of ITNs distributed by year, 2000-08

150,000 88,604
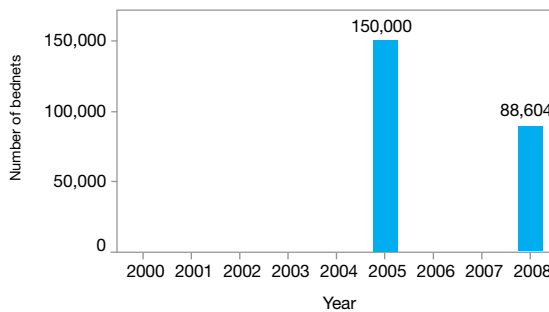
Figure 34. Sources for malaria control funds by year, 2000-08
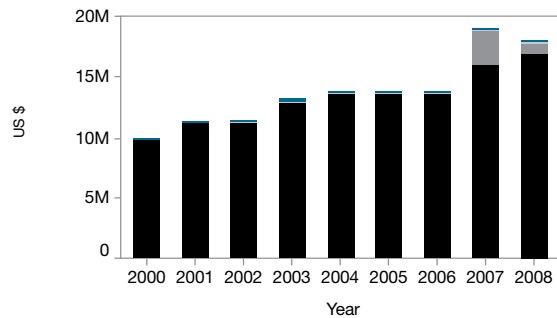
Financing sources

■ USAID   ■ Other bilateral funds   ■ Government
□ UN agencies   ■ Global Fund