

Overview of the situation

Figures 1-5

Since the 1980s, malaria has been focalized primarily in four states: Bolivar, Sucre, Amazonas and Delta Amacuro. Historically, a large part of the country's territory has been affected and transmission occurs in three main areas, eastern, western and southern, which together encompass more than 10 states. In 2002, the State of Sucre reported about 60% of the country's cases (almost exclusively malaria by *Plasmodium vivax* transmitted by the mosquito of the species *Anopheles aquasalis*). However, in the past 5 years, a high-impact intervention was conducted in Sucre, leading to a sharp reduction in cases in that region. As a result, the situation has changed over the past four years and, currently, over 80% of malaria cases are reported in eight municipalities in the states of Bolivar and Amazonas.

In 2008, Venezuela reported 32,037 cases of malaria, the lowest number since 2004, when almost 47,000 were reported. However, the proportion of cases by *P. falciparum*, which in 2004 accounted for 9.9% of the total, increased to 17.3% in 2008.

The endemic nature of malaria in the State of Bolivar is determined by migration related to gold mining, particularly on the country's border with Guyana. Mining takes place in areas where living conditions contribute to vulnerability to

transmission. The main vector here is the mosquito *A. darlingi*. The latter is also the main vector in the State of Amazonas, which accounts for a relatively small proportion of the country's burden of malaria, but constitutes a problem of high incidence among many indigenous and mestizo communities, whose widely scattered locations make it difficult to provide health services.

Another change noted in the past decade in the behavior of the disease is the presence of transmission in marginal urban areas of the City of Puerto Ayacucho, in Atures Municipality.

Morbidity and mortality trends

Figures 4 – 9

Malaria transmission has fluctuated since 2000, and peaked in 2004, 2005 and 2007. In 2008, both morbidity and the parasite combination in Venezuela were similar to those in 2000. As in 2000 there was a predominance of infection by *P. vivax* As stated above, malaria has become more focalized in the states of Bolivar and Amazonas following a drop in the number of cases in Sucre, which began in 2003. In 2004, despite the absence of a strong burden of disease in Sucre, the number of cases in the country rose to almost 42,000, primarily as a result of an increase in *P. vivax* malaria in the State of Bolivar.

Despite the significant levels of *P. falciparum* malaria particularly in the State of Bolivar, no ca-

ses of severe malaria or deaths from the disease have been reported in recent years.

Geographical distribution

Figures 1, 12-19

In 2008, the Municipality of Domingo Sifontes in the State of Bolivar reported 13,830 cases of malaria, or 43% of the total number of cases registered in the country that year. This same municipality reported 3,726 cases of *P. falciparum* malaria, or 67% of the total number of cases by this type in the country. There are three malaria foci in Domingo Sifontes; the one in San Isidro is the most important. It is located in an area with many natural breeding sites, inhabitants in several localities and heavily deforested mining areas in the middle of the jungle.

With regard to burden of disease the Municipality of Cedeño follows Domingo Sifontes with 3,727 cases reported in 2008. That same year, only seven municipalities accounted for 80% of the number of cases reported. That is to say, malaria in Venezuela is more focalized than in neighboring countries, such as Colombia or Brazil. Of the 67 municipalities reporting cases in 2008, only 25 registered over 50 cases. Of the 23 municipalities that registered cases by *P. falciparum* in 2008, only 11 reported over 10 cases each. Malaria transmission in this region of Venezuela is closely associated with mining activities and the precarious living conditions of the people engaged in those activities.

Domingo Sifontes reported the second highest malaria incidence rate in 2008, after Manapiare, in the State of Amazonas, where an incidence rate of 286 per 1,000 inhabitants was reported. The API in the municipalities of Cedeño and Sucre, in the State of Bolivar, and Alto

Orinoco in Amazonas, are also close to 100 per 1,000 inhabitants.

Malaria in specific populations

Figures 25-28

In 2008, 7% of malaria cases in the country were reported among children under the age of five years. This percentage is similar to that reported in other countries of the Region, such as Bolivia, Colombia and Ecuador. Meanwhile, the percentage of cases of malaria among people between 15 and 49 years of age was higher than that noted in most of these other countries. This is likely related to the importance of occupational malaria associated with mining activities in Domingo Sifontes.

Urban transmission accounted for only 3.3% of the cases reported in 2008; this is considerably lower than the urban proportions reported in Brazil, Bolivia and Colombia.

Although the number of cases of malaria cases among indigenous populations in Venezuela was not reported in 2008, malaria is clearly a significant problem in these communities, especially in the states of Amazonas and Bolivar. In the latter state, in the municipalities of Cedeño and Sucre in the Caura River basin, malaria is prevalent among indigenous communities. Transmission in this jungle region is associated with subsistence farming and population migration. Both the Yanomami communities in the State of Amazonas and the Guahiba communities in marginal urban and rural areas near the city of Puerto Ayacucho and the Colombian border are also affected by the disease.

Diagnosis and treatment

Figures 20-24, 29-30

The slide positivity rate has remained relatively stable over the last three years and represents a decrease when compared to the first half of the decade. Case detection, evaluated with this indicator, is near average for the Region, but the slide positivity rate is lower than in neighboring countries, like Colombia and Brazil. This might be explained by the fact that the State of Sucre contributes a high proportion of the total number of slides examined in the country and has a very low positivity rate.

Several reports have been received regarding performance evaluations of rapid diagnostic tests in different localities, but the Program has submitted no data on their use.

In 2005, Venezuela instituted the use of ACTs for the treatment of uncomplicated *P. falciparum* malaria. The first line of treatment for this form of malaria is a mefloquine + artesunate combination. The introduction of ACT in Venezuela did not result in a decrease in the number and proportion of *P. falciparum* malaria cases as it did in other Amazon countries. This may have to do with aspects of early access to and the appropriate use of the drugs. Over the last six years, Domingo Sifontes has been an essential area for monitoring antimalarial drug resistance in the context of the Amazon Network for the Surveillance of Antimalarial Drug Resistance (RAVREDA). Transmission conditions in gold mining areas, such as Domingo Sifontes, facilitate the to the establishment of potential foci for dissemination of drug-resistant malaria in the Americas. This makes transmission control particularly important in this infected area.

Prevention and vector control

Figures 31-33

Indoor residual spraying with insecticides is a widely used vector control strategy in Venezuela. Approximately 10 million people were reportedly protected by this measure in 2008, placing Venezuela among the top three countries in the region for the ratio of spraying coverage to number of cases. Despite the intensity with which this intervention has been applied, transmission in the country's most endemic area is associated with the characteristics of dwelling in mining areas, which, because of their open unfinished nature, makes the success of this measure unlikely.

Two years ago, Venezuela started implementing long-lasting insecticidal nets (LLIN), a tool that has demonstrated its usefulness in neighboring countries, such as like Guyana and Suriname. The PAMAFRO Project supported the implementation of LLINs in malaria-endemic localities bordering Colombia.

Financing of malaria control

No information was available on this subject.

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

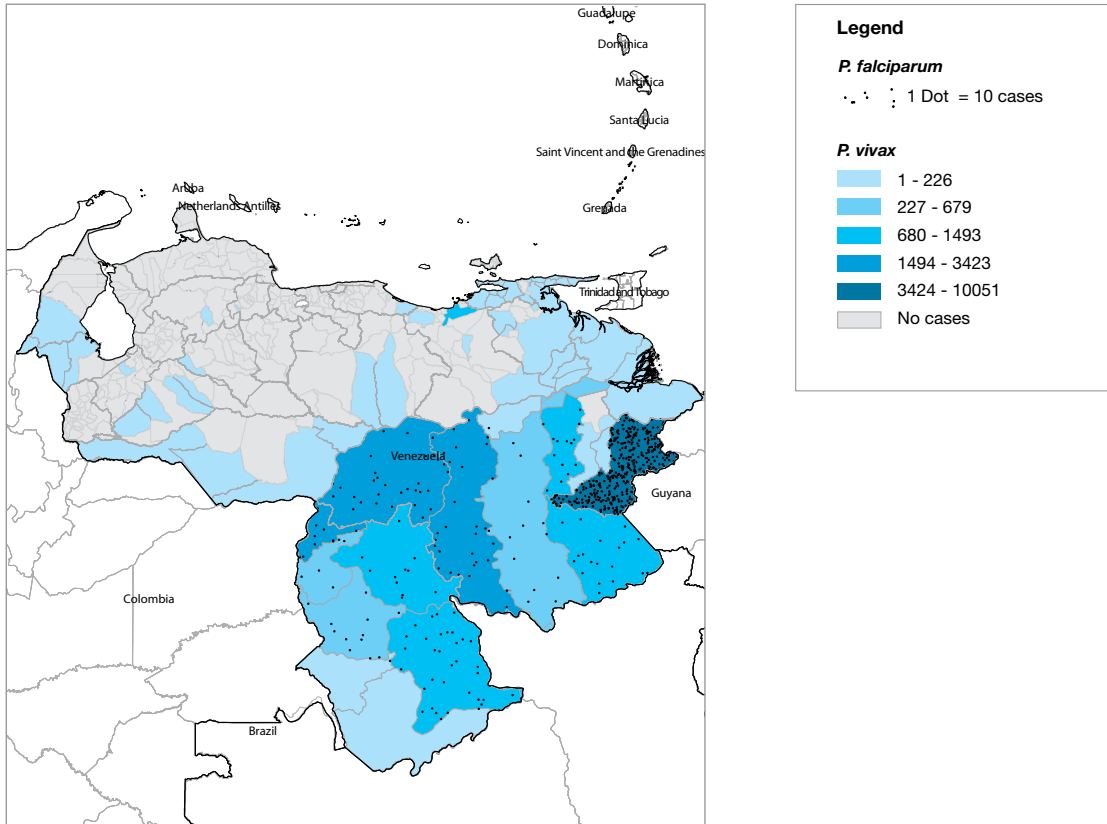
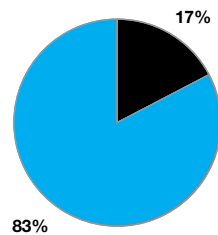


Figure 2. Proportion of cases by species, 2008



Plasmodium species

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

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

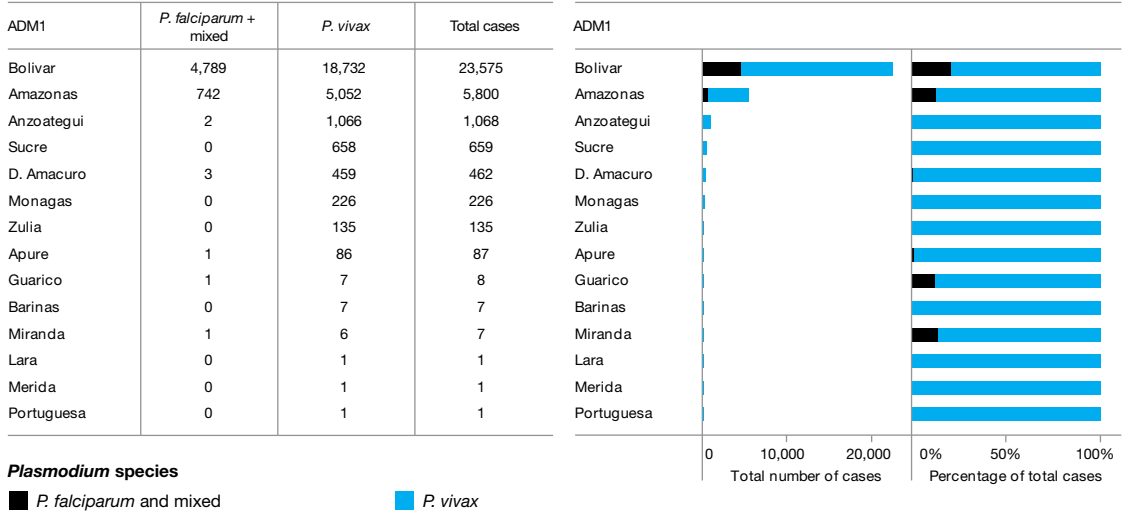


Figure 4. Number of cases by species, 2000 - 2008

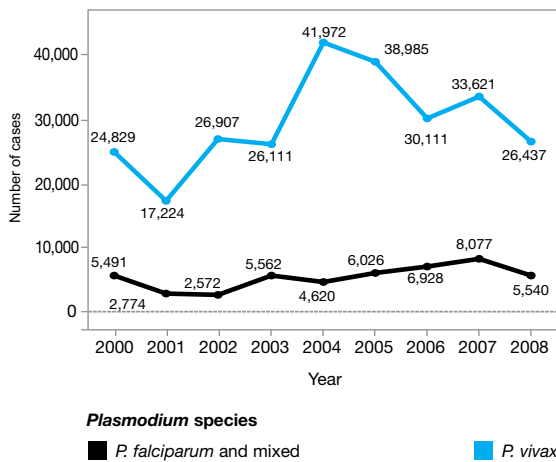


Figure 5. Number of malaria cases, 2000 - 2008

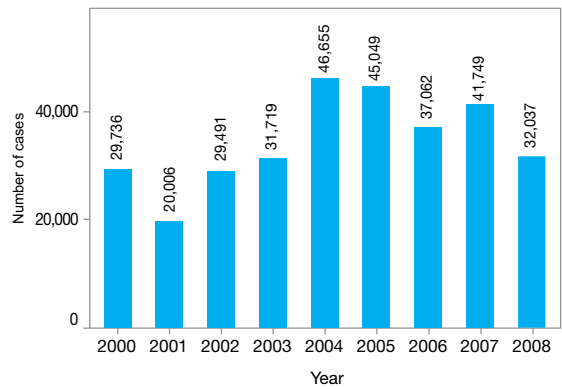


Figure 6. Number of malaria deaths, 2000-2008

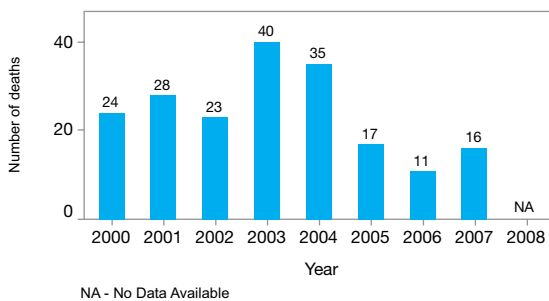


Figure 7. Number of hospitalized malaria cases, 2000 - 2008

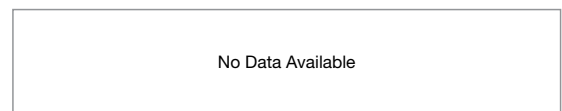


Figure 8. Annual variations in number of cases

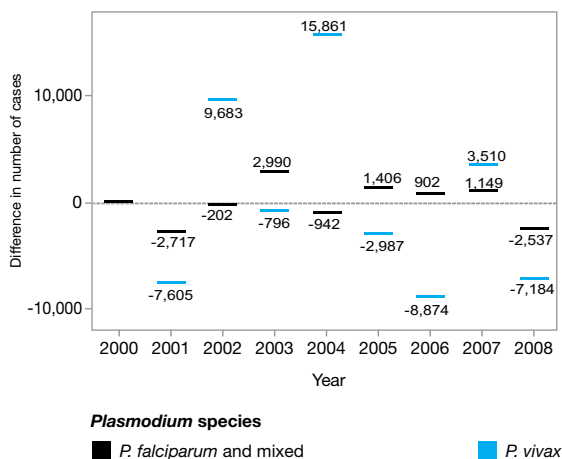


Figure 9. Percentage difference in number of cases compared to 2000

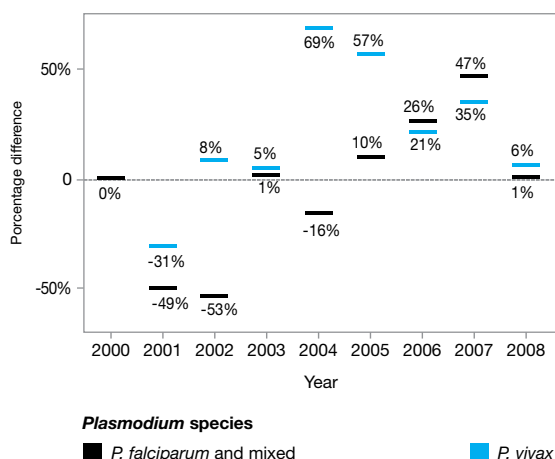


Figure 10. Number of cases and RBM / MDG targets for 2010 and 2015

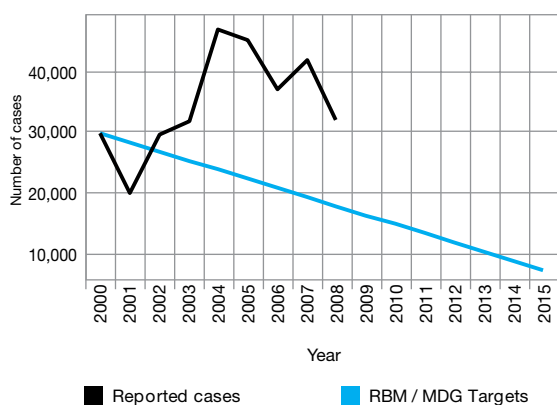


Figure 11. Percentage of hospitalized cases, 2008

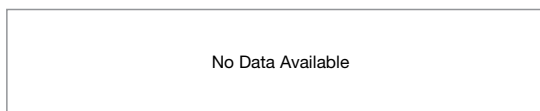
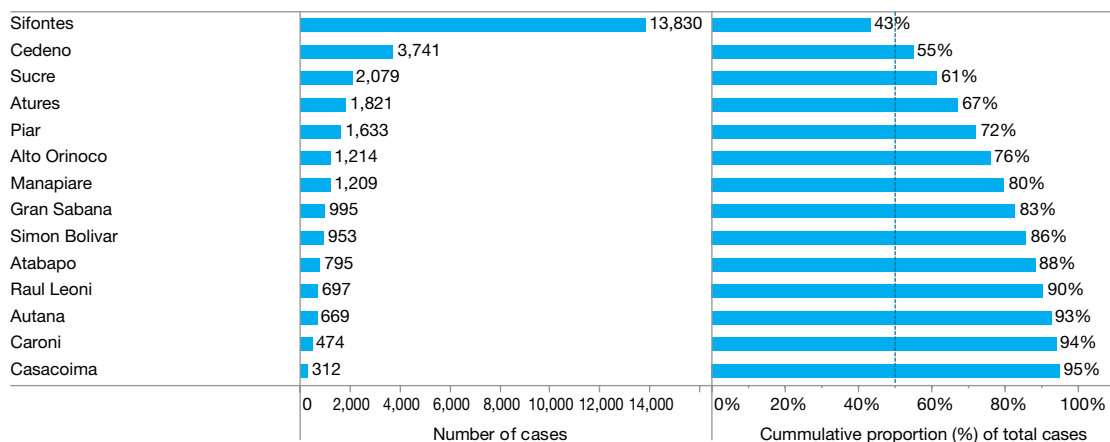


Figure 12. Districts (ADM2) with highest malaria burden and cumulative proportion of total cases in the country, 2008



* See Annex A for a complete list.

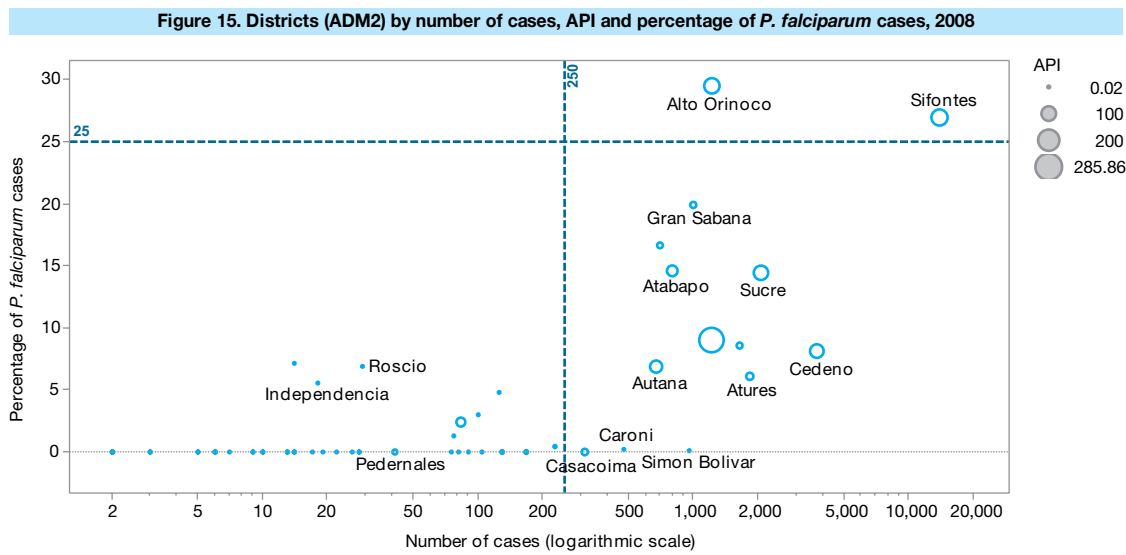
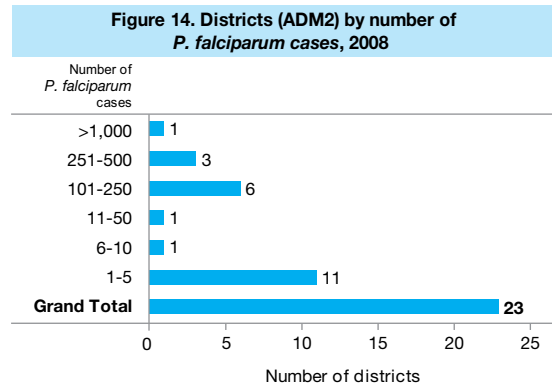
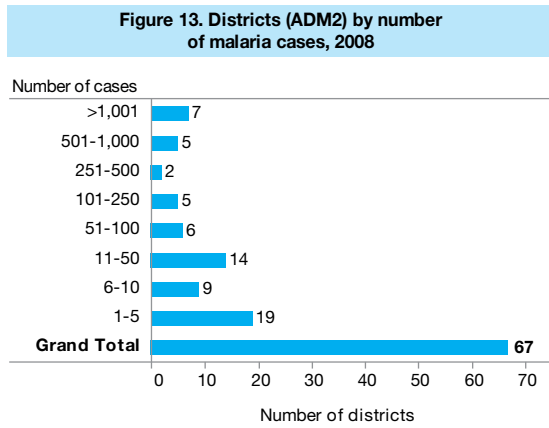


Figure 16. Annual Parasite Index (API) by districts (ADM2), 2008

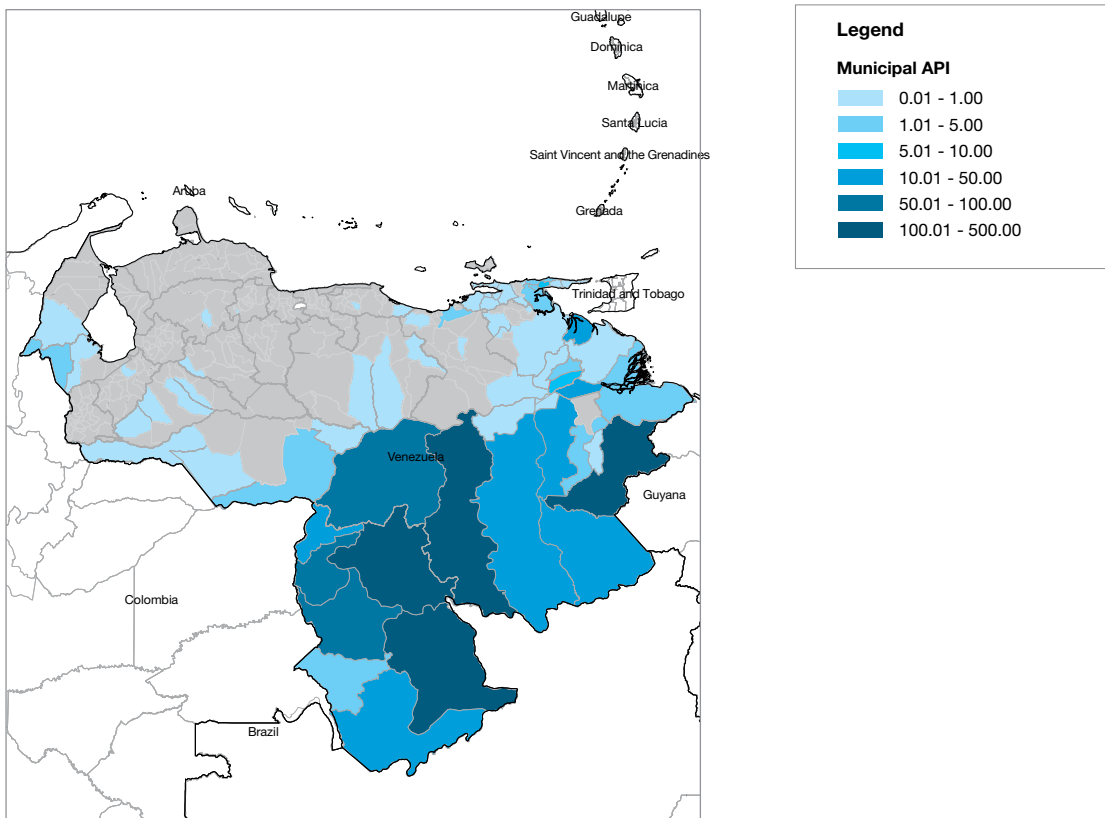
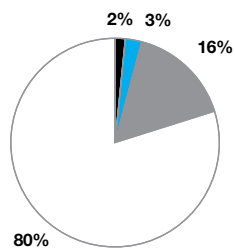


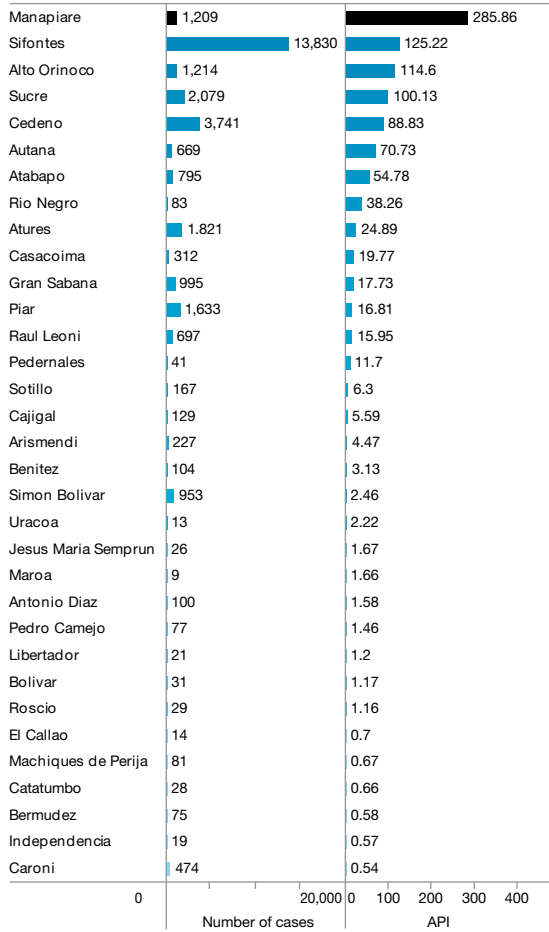
Figure 17. Population by malaria transmission risk, 2008



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

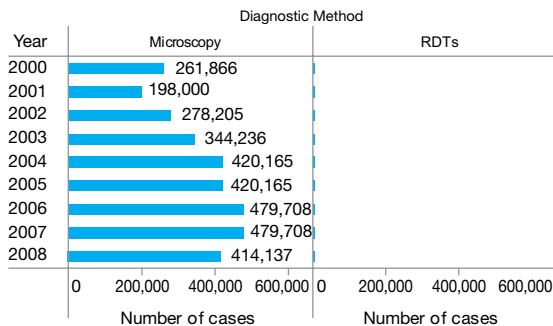


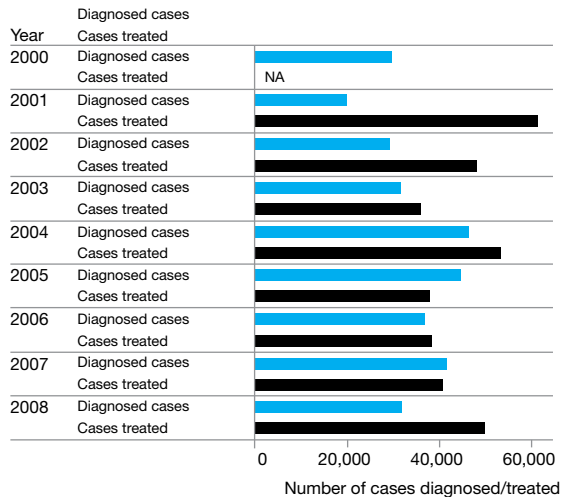
Figure 19. Population by malaria transmission risk, 2000-08

| 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 | 650,000 | 80,000 | 8,017,000 | 15,423,000 |
| 2001 | 451,000 | 232,000 | 6,563,000 | 17,396,000 |
| 2002 | 460,000 | 236,000 | 6,783,000 | 17,644,000 |
| 2003 | 512,000 | 198,000 | 4,482,000 | 20,816,226 |
| 2004 | 512,000 | 198,000 | 4,482,000 | 20,815,961 |
| 2005 | 513,000 | 352,000 | 7,176,000 | 18,426,940 |
| 2006 | 480,000 | 45,000 | 6,858,000 | 19,544,368 |
| 2007 | 469,206 | 1,519,646 | 5,904,057 | 19,708,334 |
| 2008 | 429,337 | 701,398 | 4,365,060 | 21,813,597 |

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

| Year | Number of slides examined | Number of slides positive | Slide Positivity Rate (%) |
|------|---------------------------|---------------------------|---------------------------|
| 2000 | 261,866 | 29,736 | 11.36 |
| 2001 | 198,000 | 20,006 | 10.1 |
| 2002 | 278,205 | 29,491 | 10.6 |
| 2003 | 344,236 | 31,719 | 9.21 |
| 2004 | 420,165 | 46,655 | 11.1 |
| 2005 | 420,165 | 45,049 | 10.72 |
| 2006 | 479,708 | 37,062 | 7.73 |
| 2007 | 479,708 | 41,749 | 8.7 |
| 2008 | 414,137 | 32,037 | 7.74 |

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



NA- No Data Available

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

| Nombre ADM1 | Examined | Total cases | SPR (%) |
|---------------|----------|-------------|---------|
| Bolivar | 185,834 | 23,575 | 12.69 |
| Amazonas | 63,242 | 5,800 | 9.17 |
| Anzoategui | 8,762 | 1,068 | 12.19 |
| Sucre | 119,978 | 659 | 0.55 |
| D. Amacuro | 8,106 | 462 | 5.7 |
| Monagas | 4,586 | 226 | 4.93 |
| Zulia | 5,744 | 135 | 2.35 |
| Apure | 1,159 | 87 | 7.51 |
| Guarico | 3,039 | 8 | 0.26 |
| Barinas | 3,930 | 7 | 0.18 |
| Miranda | 22 | 7 | 31.82 |
| Lara | 1,244 | 1 | 0.08 |
| Merida | 40 | 1 | 2.5 |
| Portuguesa | 1,189 | 1 | 0.08 |
| Aragua | 124 | 0 | 0 |
| Carabobo | 365 | 0 | 0 |
| Cojedes | 37 | 0 | 0 |
| Dtto. Capital | 150 | 0 | 0 |
| Falcon | 7 | 0 | 0 |
| N. Esparta | 189 | 0 | 0 |
| Tachira | 5,888 | 0 | 0 |
| Trujillo | 404 | 0 | 0 |
| Vargas | 43 | 0 | 0 |
| Yaracuy | 55 | 0 | 0 |

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

No Data Available

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

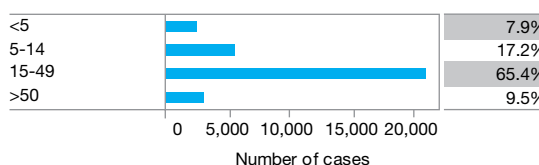


Figure 26. Number and percentage of cases by locality type, 2008

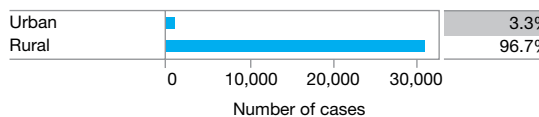


Figure 27. Number and percentage of cases in pregnant women among women of child bearing age, 2008

No Data Available

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

No Data Available

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

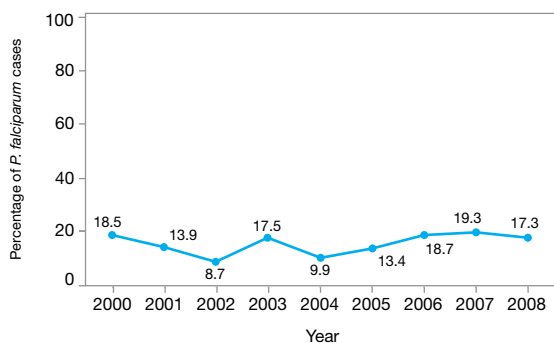


Figure 30. Number of ACT treatments distributed by year, 2000-08

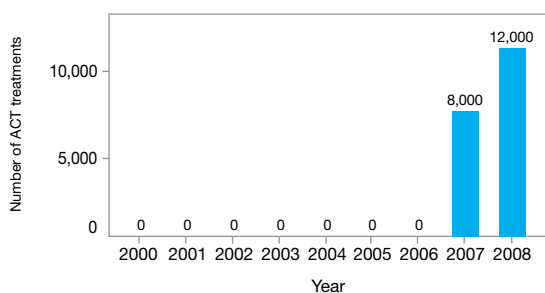


Figure 31. Indoor residual spraying coverage by year, 2000-08

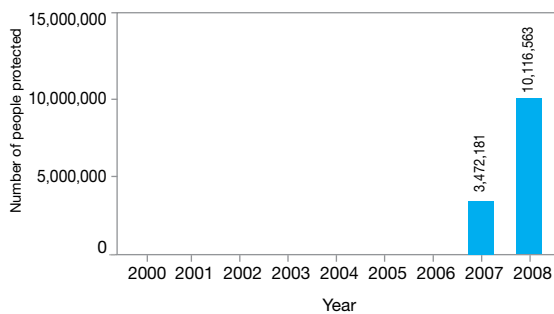


Figure 32. Number of LLINs distributed by year, 2000-08

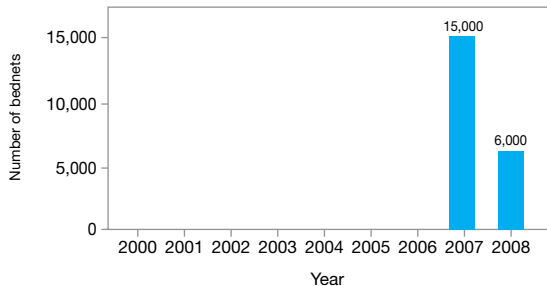


Figure 33. Number of ITNs distributed by year, 2000-08

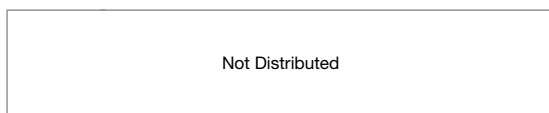
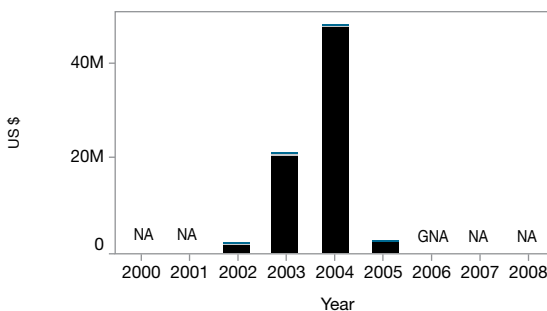


Figure 34. Sources for malaria control funds by year, 2000-08



Financing sources

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

NA - No Data Available

GNA - Data for Government funding not available