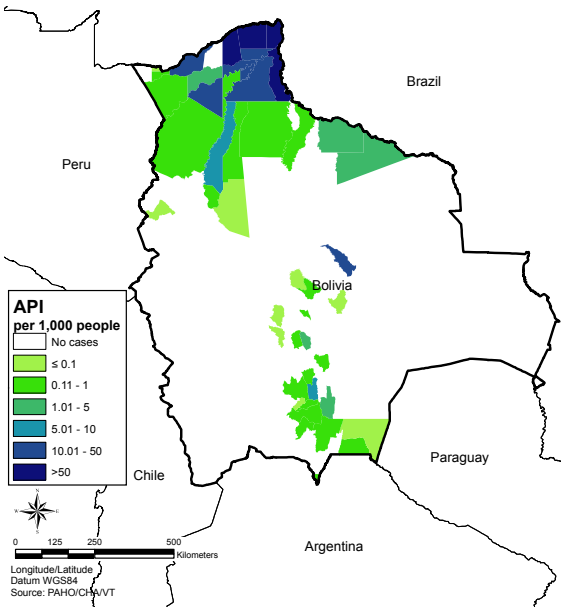
BOLIVIA, PLURINATIONAL STATE OF

Bolivia achieved the WHA 58.2 target for MDG 6C in 2011 and has maintained it since. In 2014, it had decreased morbidity by 76.5% since 2000. Deaths have also decreased and only one was reported in 2014 for the first time in 10 years.

The Amazon area in the northern part of the country has the highest incidence, particularly in the departments of Pando and Beni where 96.2% of all confirmed cases were reported in 2014 (Figures 1–3). Many of the people living in the municipalities (ADM3) of Guayaramerin and Riberalta in Beni make a living by harvesting chestnuts in the nearby Amazon forest across the border. During harvest season, the population in this area increases due to an influx of workers. In Guayaramerin, the Las

Figure 1. Malaria by Annual Parasite Index (API) at municipality level (ADM3), Bolivia 2014



Arenas stream has been identified as a breeding spot for malaria vectors and is most likely causing malaria cases in surrounding areas where people who reside close to the stream live in precarious housing (21). Approximately 95.4% of all cases in the country were due to *P. vivax,* while the rest were due to *P. falciparum* and mixed infections. *Plasmodium falciparum* cases have decreased by 66.1% since 2013. Most cases of *P. falciparum* in Bolivia have been reported in the Guayaramerin municipality. A total of 9.4% of cases in the municipality were due to *P. falciparum* infections. Most municipalities in the country almost exclusively have *P. vivax* transmission. There were about 8.7% of municipalities in the entire country that reported more than 10 malaria cases, 9.3% reported 1–10 cases, and the remainder reported no cases. There were no reported cases from the departments of Potosi and Oruro.

Figure 2. Number of cases and deaths due to malaria in Bolivia, 2000–2014

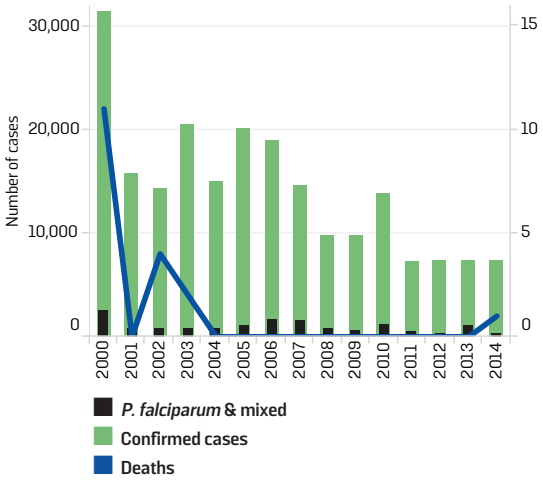


Figure 3. Municipalities with the highest number of malaria cases in Bolivia, 2012–2014

Municipality	Department	2012	2013	2014
Guayaramerin	Beni	3,857	3,897	3,240
Riberalta	Beni	1,074	1,547	2,137
Nueva Esperanza	Pando	155	215	308
Santos Mercado	Pando	24	353	300
El Sena	Pando		340	272
Villa Nueva	Pando	39	117	141
Ingavi	Pando	54	74	108
Cobija	Pando	82	124	54
Bella Flor	Pando	52	85	46
Ixiamas	La Paz	1	187	1

Decrease
Increase

0 2,000 4,000

The most common vectors in the country are *An. darlingi*, mostly affecting the Amazon area in the north, and *An. pseudopunctipennis*, affecting the southern area near Argentina.

Men are more affected by malaria than women, making up 61.9% of cases and having an incidence of 85 cases per 100,000 men compared to 51 cases per 100,000 women (Figure 4). Young men between the ages of 15-19 are the most affected age group (Figure 5). The malaria in pregnancy rate was 71 cases per 100,000 pregnant women, which was found to be 1.3-folds higher than non-pregnant women of child-bearing age.

Priority Groups

An estimated 35,000 chestnut harvesters known as *zafreros* are the most at-risk population in Bolivia. *Zafreros* migrate to harvest areas with their families and live in precarious conditions that are only accessible by river or poor and often impassible roads. Indigenous peoples also inhabit the Amazon forest area and are affected by malaria. Health services are almost non-existent in these areas.

Diagnosis and Treatment

Microscopy is predominately used to diagnose malaria cases, though RDTs have been used in the past particularly in rural areas. RDT usage was not reported for 2014 (Figure 6). An efficacy study conducted in 2011 found 6.5% of 96 patients with *P. vivax* infections to be resistant to chloroquine (22).

A 7-day course of chloroquine and primaquine is the first-line treatment for *P. vivax* infections, while artesunate and mefloquine combination therapy is used as the first-line treatment for *P. falciparum* (Figure 7).

Figure 4. Malaria cases by age and sex in Bolivia, 2014

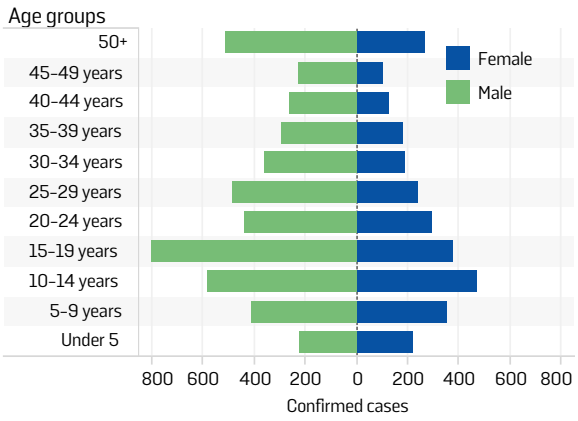


Figure 5. Malaria incidence by age and sex in Bolivia, 2014

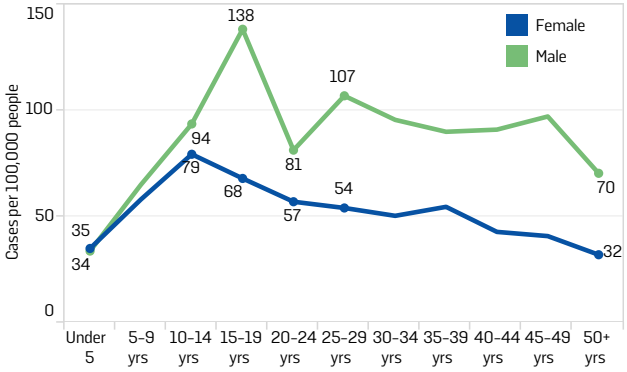


Figure 6. Blood slides examined, RDTs examined, and SPR in Bolivia, 2000-2014

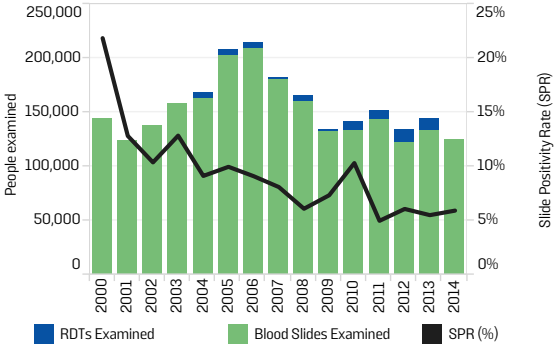


Figure 7. Number of malaria cases and those treated with first-line treatment in Bolivia, 2000-2014

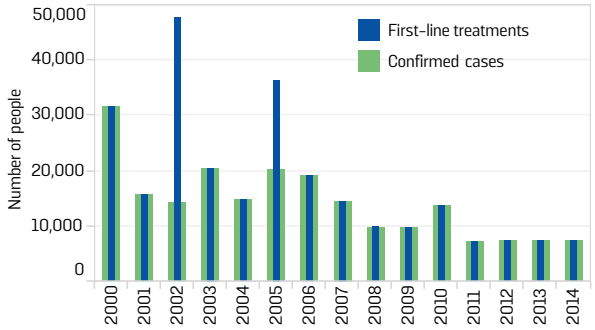


Figure 8. Time between first symptom and initiation of treatment in Bolivia, 2010–2014

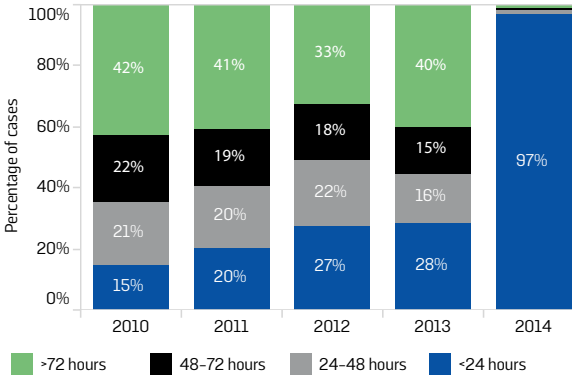
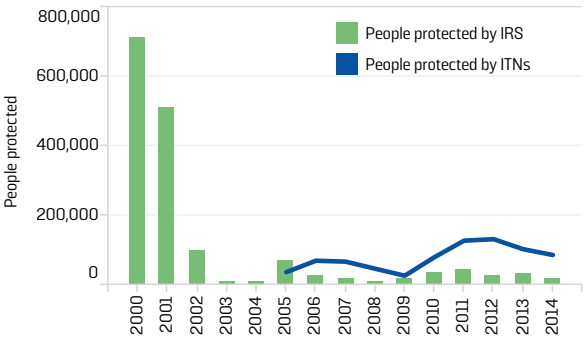


Figure 9. People protected by IRS and by ITNs in Bolivia, 2000–2014



The reported time from the appearance of first symptom to treatment improved significantly in 2014 (Figure 8). However, data for further years will be required to determine if this is an actual improvement in access to diagnosis and treatment.

Vector Control

The use of IRS has decreased considerably compared to 2000, and in 2014 protected about 16,500 people (Figure 9). Confirmed resistance to pyrethroids was detected in Guayaramerin in 2013. Vector control via ITNs protected an estimated 87,000 people in 2014 where there is a focus to distribute nets in targeted Amazonian communities as well as to pregnant women living in high-risk areas during prenatal visits.

Funding

The government has consistently provided funding for malaria throughout the years. The Global Fund has also provided support for malaria control and contributed US$1.6 million last year (Figure 10). Funds from USAID were available in Bolivia until 2012.

Figure 10. Funding for malaria in Bolivia, 2000–2014