

## NICARAGUA

Malaria is endemic in the Moskitia area along the Atlantic coast in the northwestern part of the country that shares a border with Honduras (Figure 1). In 2014, Nicaragua had reported 1,163 cases of malaria and no deaths (Figure 2). The department of North Caribbean Coast Autonomous Region (RACCN) has the highest amount of cases and is home to some of the country's most affected municipalities such as Waspan (26.2% of all 2014 malaria cases), Rosita (22.6%), Puerto Cabezas (15.4%), and Prinzapolka (9.8%) (Figure 3). However, malaria is also present in other parts of the country including along the northern Pacific coast in the department of Chinandega where sugar-cane plantations are areas of mosquito proliferation. The department of South Caribbean Coast Autonomous Region (RACCS) has had an increase in the past few years. Cases in Desembocadura de la Cruz de Rio Grande

Figure 1. Malaria by Annual Parasite Index (API) at municipality level (ADM2), Nicaragua, 2014

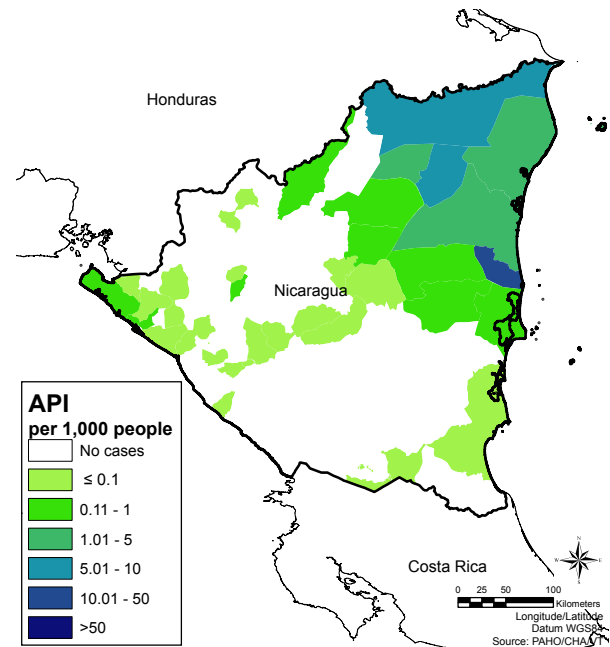
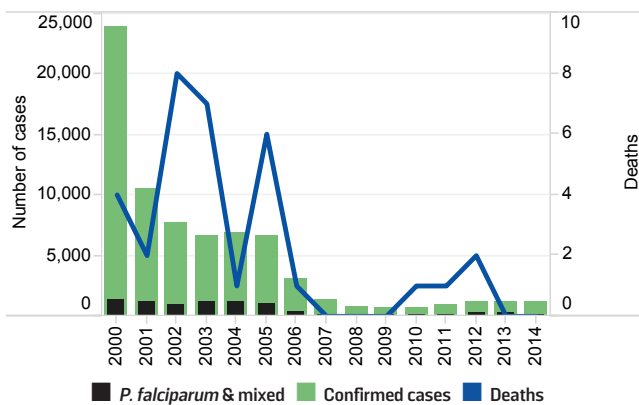


Figure 2. Number of cases and deaths due to malaria in Nicaragua, 2000-2014



municipality almost tripled in 2014 from the previous year. Together, RACCN and RACCS account for 90% of all malaria cases in Nicaragua. During 2012-2014, there were 7 municipalities reporting more than 1 case per 1,000 inhabitants in one or more years (stratum 3) (Figure 4). Main factors contributing to malaria in Nicaragua are migration, natural disasters (floods), and drug trafficking. Improved surveillance has also led to the detection of more cases. Approximately 2% of cases were reported imported in 2014. On the contrary, Costa Rica has reported five imported cases from Nicaragua since 2011.

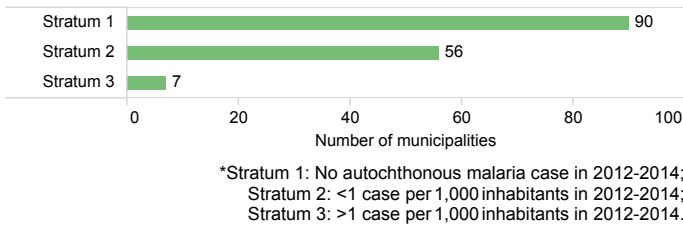
Figure 3. Municipalities with the highest number of malaria cases in Nicaragua, 2012-2014

Municipality	Department	2012	2013	2014
Waspan	RACCN**	336	398	305
Rosita	RACCN**	115	238	263
Puerto Cabezas	RACCN**	253	171	179
Prinzapolka	RACCN**	86	35	114
Bonanza	RACCN**	135	127	51
Desembocadura*	RACCS‡	32	17	50
Wiwili de Jinotega	Jinotega	2	6	40
El Viejo	Chinandega	93	78	32
Siuna	RACCN**	37	23	28
Laguna de Perlas	RACCS‡	9	1	15

■ Decrease  
■ Increase

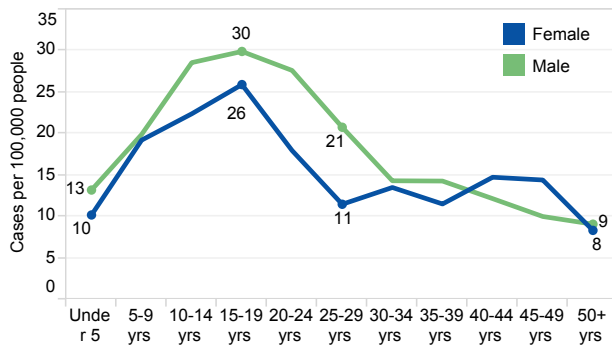
\*Desembocadura de Rio Grande  
 \*\*North Caribbean Coast Autonomous Region  
 ‡South Caribbean Coast Autonomous Region

**Figure 4. Number of municipalities (ADM2) by strata in Nicaragua, 2012-2014**

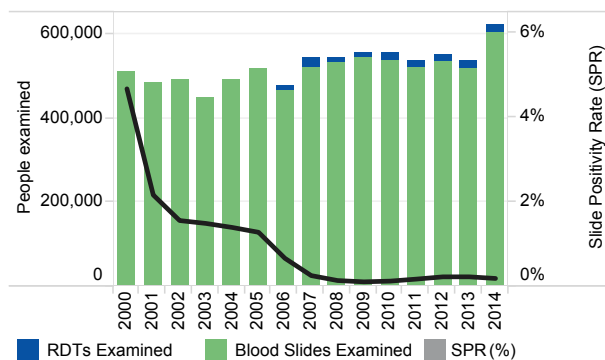


Men were more affected than women in 2014 (Figure 5), and were found to have incidence rates of 17.7 and 14.9 cases per 100,000 people, respectively. Analysis by age groups shows that men have higher incidence at most ages (Figure 6). Children (10-14) and adolescents (15-19) had the highest incidence of malaria. There were an estimated 17 malaria cases per 100,000 pregnancies in 2014, which was similar to the incidence in non-pregnant women of child-bearing age, implying that pregnant women were not at a higher risk of having malaria.

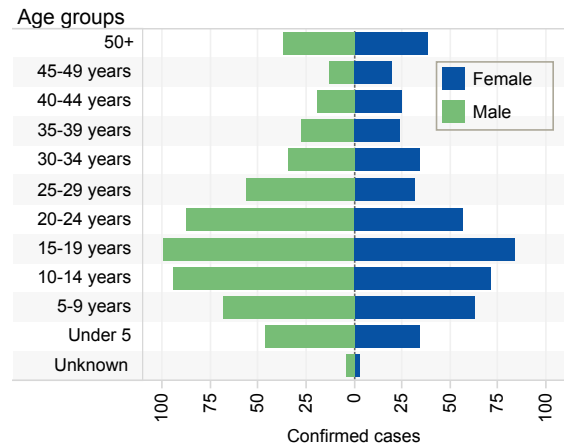
**Figure 6. Malaria incidence by age and sex in Nicaragua, 2014**



**Figure 7. Blood slides examined, RDTs examined, and SPR in Nicaragua, 2000-2014**



**Figure 5. Malaria cases by age and sex in Nicaragua, 2014**



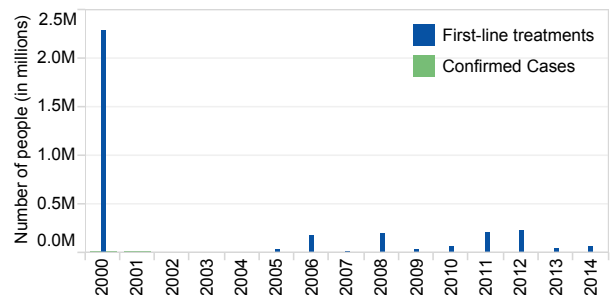
**Priority Groups**

The Miskito people of Nicaragua are disproportionately affected by malaria due to poverty, underdevelopment, and limited access to healthcare compared to the rest of the country. The area they inhabit traverses the Honduran border, which poses a problem for disease tracking.

**Diagnosis and Treatment**

Microscopy is the primary method of diagnosis in the country, though RDTs were introduced in 2006 for use in places that are difficult to access (Figure 7). Nicaragua's first-line treatment is chloroquine and primaquine for both *P. falciparum* and *P. vivax* infections. An observed dosage of chloroquine and primaquine (30 mg/kg/day) is given over the course of 7 days for treatment of *P. vivax* in Nicaragua as compared to a 15 mg/kg/day dosage for 14 days that is given in Honduras. The difference in dosage may cause confusion along the border for those with *P. vivax* infections due to the varying treatment schemes.

**Figure 8. Number of malaria cases and those treated with first-line treatment in Nicaragua, 2000-2014**

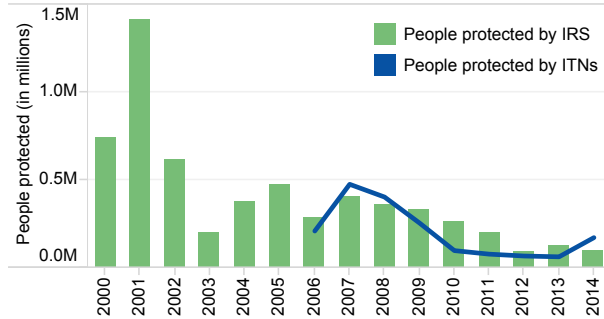


\* First line treatment data is unavailable for 2001-2004.

### Vector Control

Nearly 95,000 people are estimated to be protected by IRS in Nicaragua, which has decreased steadily since 2007 (Figure 9). Tests conducted in 2012–2014 found both *An. albimanus* and *An. pseudopunctipennis* to be susceptible to pyrethroids. More people are estimated to be protected by ITNs that IRS in 2014, with ITNs protecting 173,000 people.

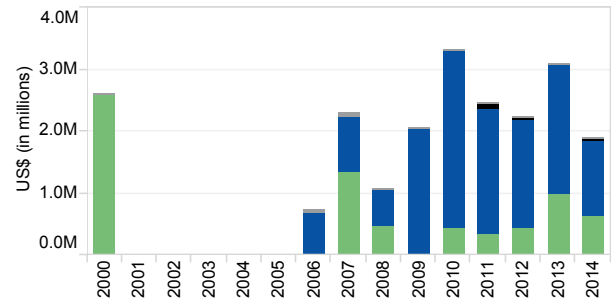
**Figure 9. People protected by IRS and by ITNs in Nicaragua, 2000–2014**



### Funding

Governmental funding for malaria at the national level has varied from one year to the other. In 2014, it was less than that in 2013, but higher than any year during 2010–2012. The Global Fund has been the main contributor of external resources since 2006 through national grants as well as providing resources through the EMMIE initiative (Figure 10). Other external funders include USAID via the AMI/RAVREDA project and PAHO/WHO.

**Figure 10. Funding for malaria control in Nicaragua, 2000–2014**



Funding information is not available for 2001–2005.

Legend: Government (green), Global Fund (blue), USAID (black), Others (grey)