Malaria transmission and internal and external mobility from 2017 to 2021 in Ecuador

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Ecuador is among the countries participating in the E-2025 initiative launched by the World Health Organization, committing to eliminate local malaria transmission by 2025.

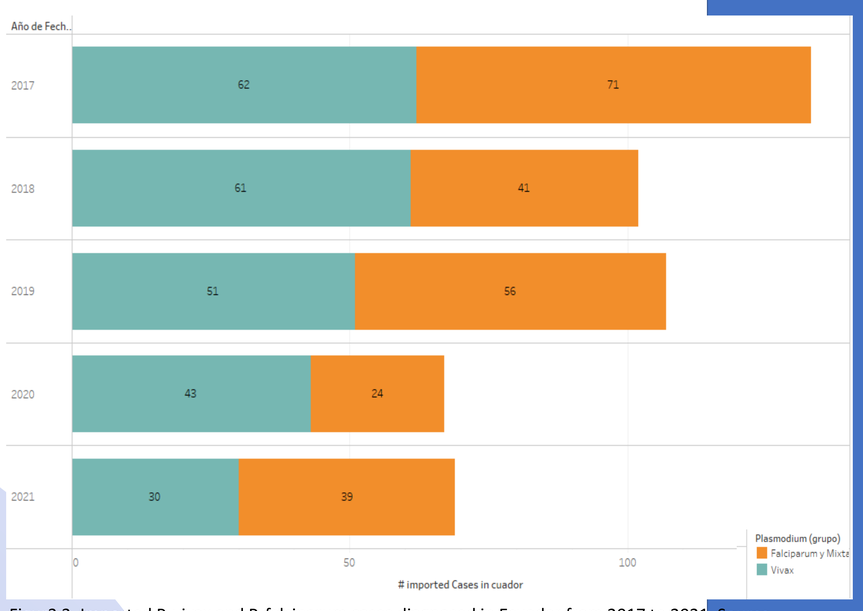
One of the challenges the country faces is the intense mobility among indigenous populations in the Amazon region bordering endemic localities in Peru, in the southern coastal region bordering Peru and the northern coastal region bordering Colombia. In the period of 2017-2021, Ecuador registered in its official information system SIVEMAE, a total of 9,326 malaria cases (16.6% correspond to cases of falciparum malaria). Of these, 477 (5%) are classified as imported cases.

Figure 1. Map of Ecuador and its 3 regions: Amazon (green), Coast (yellow), Highlands (purple). Source: forosecuador.ec

In recent years, imported cases in receptive areas have played an important role in generating outbreaks and/or maintaining transmission. Important outbreaks from imported cases occurred in the last years in Santa Elena and Cotopaxi.

Imported cases originate mainly from three countries: Colombia (200/477 cases), followed by Peru, (191/477 cases) and Venezuela (81/477 cases). Of the 2017-2021 period analyzed, 2017 had the highest number of imported cases (133/477, 28%) with origin of infection in Peru (66/133, 50%) and Colombia (56/133, 43%).

Of the 477 imported cases registered in Ecuador, 229 people reside in Ecuador, mainly in the province of Esmeraldas - 108 in five years, of which 97 have probable locality of infection in Colombia. Two cantons at Esmeraldas concentrate almost all imported cases: San Lorenzo (75 cases) and Esmeraldas (22).



Figur3 3. Imported P. vivax and P. falciparum cases diagnosed in Ecuador from 2017 to 2021. Source SIVEMAE national data visualized in Tableau Software.

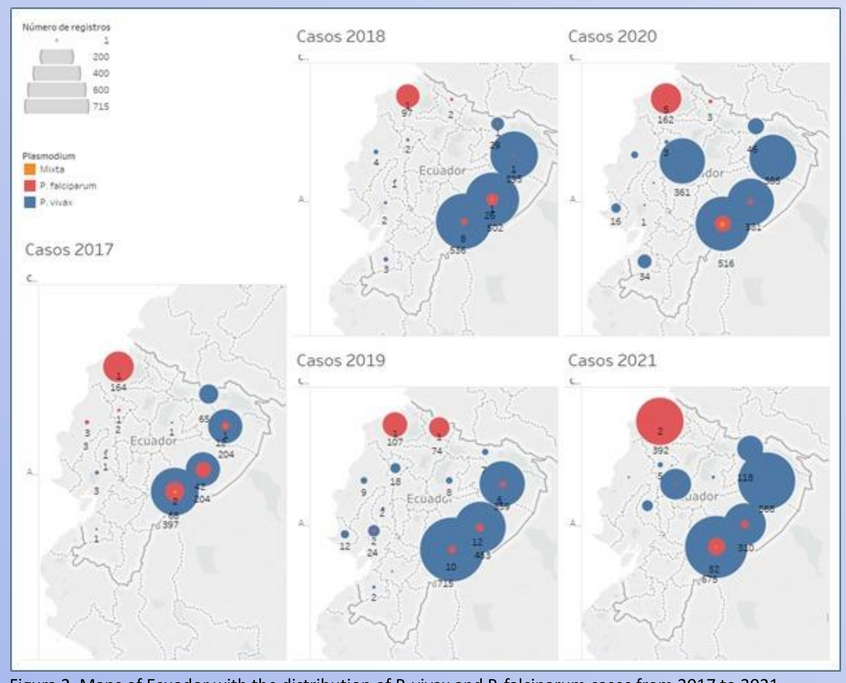
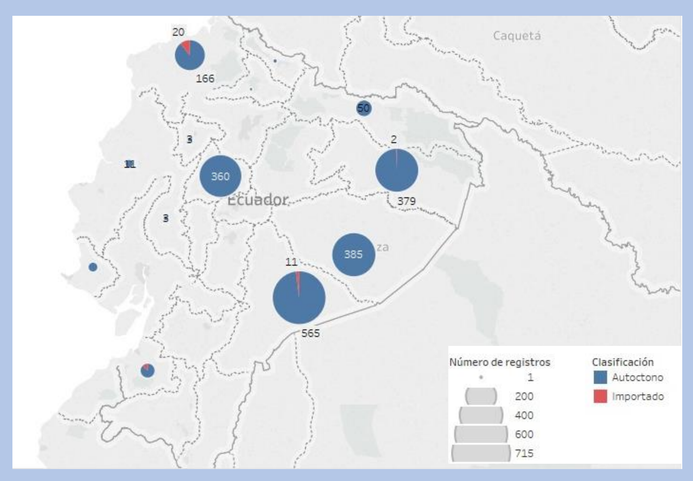


Figura 2. Maps of Ecuador with the distribution of P. vivax and P. falciparum cases from 2017 to 2021 . Source SIVEMAE national data visualized in Tableau Software.



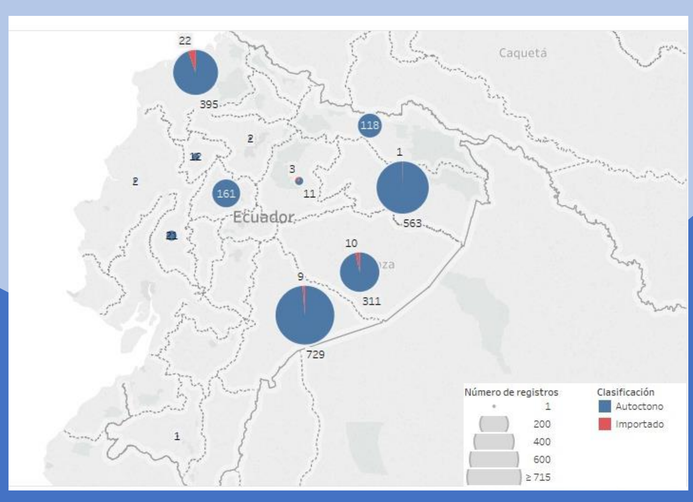


Figure 4. a) Distribution of imported cases in Ecuador by province in 2020. b) Distribution of imported cases in Ecuador by province in 2021. Source SIVEMAE national data visualized in Tableau Software.

The province of Morona Santiago has a total of 58 imported cases in these years, including the canton of Taisha, which has a total of 46 cases.

More than 95% of imported cases registered in Ecuador are from neighboring countries, accessible by land or river, by formal or informal borders. On the border with Colombia, mobility is motivated by the strong presence of mining, while between Ecuador and Peru it is the family and cultural ties between communities that determine mobility.

Regarding internal mobility, this is more important in the indigenous communities of the Amazon, with emphasis on the Taisha Canton, which registers more cases with a difference between the place of residence and the place of infection. Taisha is located on the eastern border with Peru, with an Achuar and Shuar indigenous population, with high mobility regardless of borders.

Mobility occurs in both directions, is not only frequent, but also continuous and therefore requires specific strategies.

Analyses of mobility between communities with ongoing malaria transmission demonstrate the need to maintain active surveillance and are essential for structuring national and inter-country interventions for malaria elimination.