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POPULATION DISPLACEMENT AND EPIDEMIOLOGY OF MALARIA IN THE PURUS RIVER BASIN, BRAZIL

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Malaria is one of tropical diseases more incidents in the world. Approximately 40% of the world's population lives in areas with a risk of transmission of malaria, resulting in approximately 300 million people infected in the world each year[1]. Standing out among the three major epidemics of the 21st century along with AIDS and tuberculosis. Currently in Brazil the risk of malaria transmission is not uniform because the endemic area is the Amazon, comprising the states of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima, Tocantins and part of Maranhão

Approximately 99.8% of malaria cases around the country are registered in the region, with an average of 500,000 cases annually [2]. And among them, the states of Acre and Amazonas, which is located in the Purus River basin (Figure 1), has been presenting since 2005 the largest Annual Parasitic Index (API) [2].



Figure 1: Location of the study area. Purus River basin, Amazon, Brazil. Source: IBGE and ANA

The Purus River basin is still little altered by human action, and has higher level of natural environments conservation. Currently, the interface region between the eastern portion of the state of Acre and Amazonas is bounded by the scenario of the agricultural frontier expansion, by the logistics given for the BR-364 BR-319 and BR-230. It is this region that concentrates the impact

of the occupation in the basin, associated mainly to logging and agricultural activities [3] [4].

Its population is composed mainly by settlers, and indigenous riparian and are mainly concentrated in the main channel of the Purus, split between municipal centers, Indian reservations, the groves and rural settlements [3]. To perform this study we used the registration of malaria cases between 2003 and 2006 obtained from the computerized database of the Information System for Epidemiological Surveillance - Notification of Cases of Malaria (SIVEP-Malaria). The data was used by local epidemiological summary reporting of the 21 municipalities belonging to the Upper Purus, which contains the number of examinations and total positive cases of malaria, compiled by the proportion of positive smears from autochthonous cases contracted in the same notification town and imported, that is, he had a letter in the municipality, but the illness was contracted in another. After the collection was the collection and systematization of all data and were subsequently inserted in an environment of Geographic Information System (GIS). In this environment took place space-time analysis and as the product of such cartograms are generated with the distribution of cases between 2003 and 2006.

Is observed in Figure 2 that about 80% of malaria cases reported in low and middle Purus except for Boca de Acre and Anori are autochthonous. That is, the person was contaminated and the notification occurred in the same town. This is probably the difficulty of access to the region, coupled with the dynamic environment that interferes with the population dynamics in these two sectors of the basin. In this region the floodplain areas are large and suffer from seasonal flooding and there are no other modes of transport, besides the river [3]. The deeper draft boats to carry passengers and cargo have moving difficulties during periods of drought, reducing considerably the shift in population and trade.

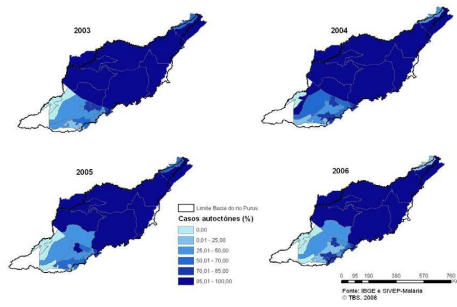


Figure 2: Percentage of autochthonous cases in the cities of Rio Purus Basin between 2003 and 2006. Source: SIVEP - Malaria and IBGE

The opposite occurs in all municipalities of Alto Purus, which have smaller territorial extensions and are cut by federal and state highways. This setting changes the pattern of spread of disease, because the data show the occurrence of low numbers of autochthonous cases and indicate there has been more reporting of cases imported from other counties [2]. In this region of the basin lies the capital of Acre, Rio Branco, from where it gives the intersection of federal and state highway linking it with the interior (Figure 3).

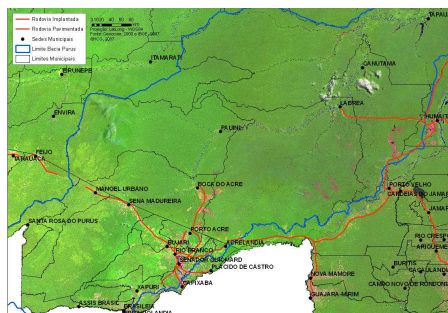


Figure 3: Roads that cross the upper and middle Purus. Source: IBGE and GeoCover

It was found that the cities of Acre have been reported cases of people who contracted malaria mainly in Porto Velho (RO), Boca do Acre (AM), Lábrea (AM) and Bolivia. Approximately 69% of cases contracted in Porto Velho and 59% infected in Boca do Acre were recorded in the capital, Rio Branco. Already those from Lábrea, 49.5% were reported in Rio Branco, 45% in Acrelândia. The cases stemmed from Bolivia, 26.5% were registered in Capixaba that is a border city with that country. These numbers demonstrate the important population dynamic that exists between the cities of Acre, in the extreme south of Amazonas and Rondônia, in addition to bordering countries belonging to the basin. They may also be pointing out that the health infrastructure in some cities or countries, is in poor condition, causing people to seek medical help in other municipalities. As Rio Branco where the registration of malaria cases is around 2,500 per year, with 66% of these cases are imported. The disease in this region appears strongly related to vegetation changes resulting from agricultural expansion and population dynamics of an intense attraction due to the strong population of many susceptible individuals

without previous contact with the disease for manpower on projects settlement.

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