

#### 4.7. Peru

Peru has a population of 25,232,226 inhabitants, 72% of which live in urban areas. Thirty percent of the total population is exposed to malaria or live in areas with ecological factors favorable to transmission. The epidemiological stratification shows that 8% of the population lives in areas of high and very high risk of malaria transmission.

Malaria in Peru (1999): Epidemiological Map by Risk Levels is presented in Annex 1, Figure 6.

During the period 1995-2000, the general objective of the Malaria Control Program has been to control the disease especially in high risk areas thereby decreasing the morbidity and mortality caused by malaria, controlling the negative impact on the population and in the country's development. Early diagnosis and treatment are the current strategies being employed to control the disease and prevent epidemics.

Due to its magnitude, malaria is considered one of the main reemerging communicable diseases in Peru. The disease affects the rural and native populations in agriculturally developed areas, and in areas of new colonization currently under demographic expansion. Epidemiologically, malaria is easily affected by both climatic changes and natural disasters, such as flooding. It is estimated that the direct cost derived from malaria in Peru during 1998 approached 34 million dollars.

Malaria in Peru is associated with tropical zones and irrigated desert areas in the northern coast and in the northwestern mountainous region, the forest in the central southwestern region and in the low rain forest of the Amazonian region. During the period of 1994-1998 the Ministry of Health reported an annual average of 180,000 confirmed malaria cases and indicated a tendency to increase at the national level. The regions responsible for this increase in 1998 were Loreto, Piura (I, II) and Tumbes.

The more active and unstable endemic-epidemic areas concentrated 80% of the total number of cases during 1994-98. Those areas are the following: the northern region called Macro North Region (Piura I and Piura II), the Amazonian Macro Region (Loreto and San Martin) and the Central Forest Macro Region (Junin, Jaen, Cusco).

The proportion of *P. falciparum* cases increased from 1.6% in 1992 to 28.3% in 1996 and decreased to 26.6% in 1999. The global increment in the number of malaria cases in 1997-1998 was a direct consequence of the *El Niño* phenomenon. This effect was controlled during 1999.

*The main factors associated with malaria transmission in Peru are as follows:*

- Expansion of the agricultural frontier
- Migration, caused by the expansion of the agricultural frontiers
- Environmental phenomenon
- Resistance of *P. falciparum* to antimalarial drugs
- Difficult access to health services in some areas
- Reduced susceptibility of certain vectors to plaguicides in the N. Macro Region.

The malaria and other vector-borne disease control programs consist of multidisciplinary units with technical, executive and normative functions at national, regional and local levels. The health sector reform, started in 1994, has favored the implementation of decentralized actions to approach malaria:

- From 1994 to 1999 the percentage of health services with malaria control programs increased from 41.8% to 81.8%
- The coverage of public health laboratories doing the “dipstick” exam increased from 64.3% in 1994 to 95.4% in 1999
- The quality control of the public laboratories increased from 52.8% in 1995 to 76.4% in 1999
- The efficiency of the treatment with Chloroquine-Primaquine for *P. vivax* malaria in the health services area increased from 62.1% in 1995 to 92.3% in 1999
- The rate of abandon of malaria *P. vivax* treatment (Chloroquine-Primaquine) in health services decreased from 36% in 1995 to 7.7% in 1999
- The efficiency of the *P. falciparum* malaria treatment increased from 65.7% in 1995 to 93.6% in 1999 and the abandon of this treatment decreased in the same period from 29.3% to 3.7%

The strategy to tackle the resistance of the parasites to anti-malarial drugs includes situation analysis, a pilot study with standard methodology, multi-center studies, the elaboration of an anti-malarial national policy, and the establishment of a National Antimalarial Resistance Surveillance System.

*Finally, the following points were highlighted:*

- The Global Strategy for Malaria Control has been implemented in the country since 1994. The country sees RBM as a way to reinforce these efforts.
- Since 1994, health sector reform that has favored the implementation of decentralized actions to approach malaria has been initiated.
- There are 6,500 health centers with 25,000 workers. Their staff has been trained in diagnosis and treatment of malaria. All health workers are in some way involved in one of the components of malaria control, especially malaria clinical diagnosis, confirmed by a laboratory of the public health system.
- In the Amazonian Region of the country where 9% of the population live, the laboratory network has been expanded to approximately 360 centers.

- Between 1994 and 1997 there was a reduction in the API. In 1998, due to the climatic effects of El Niño, there were 247,000 malaria cases reported, an increase of 32% in the API from the previous year.
- The majority of malaria cases come from the northern region of the Pacific Coast, of which 60% of these are *P. falciparum* infections. This situation worsened due to El Niño.
- In 1999, 140,000 malaria cases were reported, representing a reduction of 38%. During the first semester of 2000 a further decrease in malaria cases was observed.
- In relation to RBM elements, efforts are being made to systematize evidence-based research. The research agenda includes the use of the rapid diagnosis test (dipstick) and the investigation of resistance of *P. falciparum* to anti-malarial drugs. In addition, efforts are being made to coordinate actions in the areas of environmental control, surveillance and vector behavior within a decentralized malaria program.
- The implementation of RBM has permitted the promotion of external (outside health service) activities simultaneously with the activities implemented in the health services. This implicates health actions on both the individual and collective levels.
- Studies about cost-effectiveness of these actions have also been carried out.