Environmental risk factors for diseases transmitted by vectors: 
a case study in North-Argentina

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Abstract: The study quantifies the environmental risk factors for two diseases with different vectors and cycles of transmission: malaria and Chagas' disease in N.W. Argentina near the Bolivian border. This is the area within Argentina where malaria is still a serious health problem. Chagas' disease is to some extent present in many parts of the country. The field work for the study concerned 9003 people in 3466 dwellings. The study resulted in detailed maps of risk factors, particularly water quality and contacts with migrants from Bolivia in the case of malaria and thatched roofs and dogs in the case of Chagas' disease.

Key words: Chagas' disease, Salvador Mazza, environmental risk factor, malaria, vector borne disease

Introduction

Environmental risk factors belong to the natural history of diseases; they correspond to different physical, chemical, biological, economic, psychological and sociocultural phenomena related to pathologies. They are particularly important for the prevention of diseases and the promotion of health because one can interfere in order to control or eradicate a pathology. In the present study we will try to quantify the risk factors for two diseases with different vectors and cycles of transmission: malaria and Chagas' disease.

In spite of a significant withdrawal of vector-borne diseases in Argentina, Chagas' disease and malaria still occur, particularly in the northern part of the country.

Malaria is produced by parasites of the genus Plasmodium transmitted to man by mosquitoes of the genus Anopheles. The World Health Organization (WHO, 1995) estimates the number of people at risk to 2,400 million and the infected people per year between 300 and 500 million. In Argentina it was a serious problem in the centre and the north of the country until the 40s, when a programme of control started on the basis of sanitation and the treatment of fever. In the 50s a programme of spraying in the houses was added. These actions limited the area of transmission to the Bolivian border where the transmission remains because of the ecological conditions and the intensive border traffic which maintain permanently the cycle of the disease.

Chagas' disease is produced by a protozoan of the genus Trypanosoma transmitted to man by haematophagous hemipterous of the subfamily Triatominae. The WHO estimates the number of people at risk in Latin America to 75 million (OPS, 1990), without taking Mexico into account as the data are lacking. The estimated prevalence is from 0 to 10% for the rural population and for poor urban suburbs (about 18 million infected people). In Argentina the prevalence rate in 18 year-old male citizens called for compulsory military service amounts to 1.9% (national average).
but some provinces exceed 10% (Ministry of Public Health, 1994).

The most important forms of transmission are vectorial, transfusional and transplacental. The most frequent is the vectorial transmission; consequently, the programme of control is based on various methods of domestic spraying and the control of blood banks.

Materials and methods

A case study has been analysed in the NW of Argentina near the Bolivian border. It is situated in Salvador Mazza (Pocitos) in the north of the department of San Martin (province of Salta).

Field work and a very detailed inquiry (1,466 dwellings and 5,903 people) in the periphery of Salvador Mazza during the period 1992–1994 were carried out. This figure accounts for the total number of inhabitants in the suburban area.

The inquiry included the direct observation of the peridomestic environment and of the dwellings analysing the type of vegetation, the presence of free animals, hygienic conditions, the presence of possible breeding of vectors, the building materials of walls, roofs and floors of houses, the presence of openings, the size of rooms, the type of bathrooms and their distance from the kitchen and bedrooms. The composition and mobility of the family as well as the occupational and environmental health risks were deter-