

72303

IDRC-Lib
72303

ASPECTS OF THE LEISHMANIASES
WITH EMPHASIS ON SOCIO-ECONOMIC CONSIDERATIONS

ARC 4110
WIJEYA
no 1

by P.M. Wijeyaratne,
Senior Program Officer
Tropical and Infectious Diseases
Health Sciences Division
IDRC, Ottawa, Ontario, Canada

Presented at, ; - UNDP/World Bank/WHO Special Programme For Research [TDR]
Meeting on Economics of Tropical Diseases
Manila, Philippines, Sept. 1986.

To be published in Social Science and Medicine.

**ASPECTS OF THE LEISHMANIASES
WITH EMPHASIS ON SOCIO-ECONOMIC CONSIDERATIONS**

A discussion paper

<u>CONTENTS</u>	<u>PAGE</u>
Introduction	1
1. The various forms of leishmaniasis affecting man and their transmission	1
2. Geographic distribution	3
3. Diagnosis and clinical manifestations	4
4. Surveillance and control	5
5. The affected populations	7
6. Diagrammatic overview	8
7. Social considerations.	9
8. Economic considerations10
9. Bibliography11

ASPECTS OF THE LEISHMANIASES
WITH EMPHASIS ON SOCIO-ECONOMIC CONSIDERATIONS

Introduction

The leishmaniasis constitute a group of diseases, although of worldwide distribution, that have been relatively neglected in terms of research in the past. As such, the socio-cultural and economic relationships of the disease remain virtually undocumented and perhaps also unappreciated.

This paper for discussion is attempted with that underlying spirit in mind. It is aimed at generating key issues that need to be investigated, and to examine some approaches towards achieving them. This disease is also thought of as an example where research would also have ramifications to the control of other tropical diseases existing in the area.

The International Development Research Centre has been supporting various research projects on the leishmaniasis in different parts of the world and considers it one of its priority areas for support. The Centre is also currently proposing to conduct a workshop/symposium, in the near future, on the strategies for leishmaniasis control.

1. The various forms of leishmaniasis affecting man and their transmission

The Leishmaniasis caused by the protozoan parasites of the Leishmania group are known to occur in man in at least three major recognized forms; visceral leishmaniasis (VL), cutaneous leishmaniasis (CL) and mucocutaneous

WORLD DISTRIBUTION OF VISCERAL LEISHMANIASIS

Figure 1



WORLD DISTRIBUTION OF CUTANEOUS LEISHMANIASIS



WORLD DISTRIBUTION OF MUCO-CUTANEOUS LEISHMANIASIS



leishmaniasis (MCL). These three forms have been mainly based on clinical distinction and due respectively to different parasitic species, Leishmania donovani, L. tropica and L. braziliensis which are now known to be split into several closely related subspecies and strains. The diseases are transmitted by the bites of sandflies, mainly Phlebotomus (in the Old World) and Lutzomyia (in the New World). The sandflies become infected either from man or more frequently from domestic or sylvatic rodents, dogs and other mammals. Man to man transmission (or anthroponosis) of these infections have only been shown to occur in certain areas such as India and Bangladesh, while transmission from animal reservoirs (or zoonosis) appears to be the widespread mechanism in endemic regions.

2. Geographic distribution

The geographic distribution of the Leishmaniases (fig. I) is quite varied (TDR, 1985). Asia, the Middle East, Africa and Latin America are all affected by one or more of the forms. For instance, VL is endemic in several parts of Africa, the Indian subcontinent and Latin America, and occurs sporadically in China, the Mediterranean Basin, southwest Asia and southern parts of the Soviet Union (World Health Organization, 1985). CL also has a very similar distribution in the world. MCL, on the other hand, is primarily found in South America, although cases have also been reported in Ethiopia and the Sudan.

3. Diagnosis and clinical manifestations

The laboratory diagnosis of the leishmaniasis is still unreliable with the available techniques in terms of lack of sensitivity and specificity. Intradermal skin tests (Montenegro test), parasitological identification of biopsy material from lesions, bone marrow and liver, and serological tests are all being used but with varying degrees of success.

The clinical manifestations of the leishmaniasis are very many and show a great variety in the different forms and in different areas. However, in general, cutaneous leishmaniasis may manifest as simple self-healing lesions on the skin or as widespread diffuse lesions of a painful and chronic nature leading to disfiguring scars (Convit and Pinardi, 1974). It is known that the time elapsing between infective sandfly bites and the appearance of signs may vary from three months to as much as three years.

Mucocutaneous leishmaniasis may first manifest as a papular skin lesion which may transform to a nodular tumour that could later show apparent spontaneous disappearance. Commonly, however, parasite invasion of the mucous membrane of the upper respiratory tract occurs, causing extensive destruction of surrounding tissue. Naso-pharyngeal cartilages including the palate become eroded, with frequent involvement of the trachea and larynx, resulting in gross mutilation, disfiguration and in a few cases to death due to lung infection. Both CL and MCL forms are handled by the affected people in various ways. Traditional treatment methods use drastic local preparations of various types including battery acid, tar and toxic herbal concoctions, none of which cure the disease.

The currently available drugs too are toxic and require the patients to be hospitalized for treatment, often for prolonged periods and invariably with no complete cure.

Visceral leishmaniasis (or Kala azar), involves leishmanial parasites infecting the reticulo-endothelial cells of various organ systems of the body, mainly the spleen, bone marrow, liver, lymph nodes and skin. Anaemia, recurrent fever, loss of weight and increasing enlargement of the liver and spleen are characteristic of VL, and progressive wasting is common. Treatment is very difficult and recovery is rare, eventually leading to death. After a prolonged duration, Visceral leishmaniasis may lead to cutaneous lesions that may persist, being then called post-kala azar dermal leishmanoid (PKDL) with associated problems and with possible relevance to transmission of infection.

4. Control measures

In principle, the leishmaniasis can be controlled by intervention focussed on vulnerable pathways in the cycles of transmission whether it be an anthroponosis or zoonosis. The following are some examples of the control measures.

- a) parasite control by treating infected individuals. These measures have been very ineffective due to the lack of effective and feasible drugs of choice, and due to the presence of animal reservoirs maintaining the natural cycle.
- b) Vector sandfly control measures either by larvicidal or adulticidal approaches:

In the past, some measure of success of this was accidentally achieved due to malaria vector control programs by the use of residual insecticides. However, the highly varied breeding ecology of sandfly larvae, as well as the complex and mostly unknown biting habits of adult sandflies, has not yet made this approach appear feasible in most situations.

c) Preventive measures aimed at protecting the risk groups of the community:

This approach has hardly been attempted due to:

- i) the largely unknown risk factors in acquiring the infection;
- ii) the unavailability of effective chemicals such as repellants to impede man-vector contact;
- iii) the lack of antileishmanial prophylactic drugs for community wide usage; and
- iv) bed nets to prevent sandfly attack making conditions hotter and with decreased ventilation.

d) Animal reservoir control:

Although such measures have been attempted in a very limited scale, impediments to their success in controlling the disease have been:

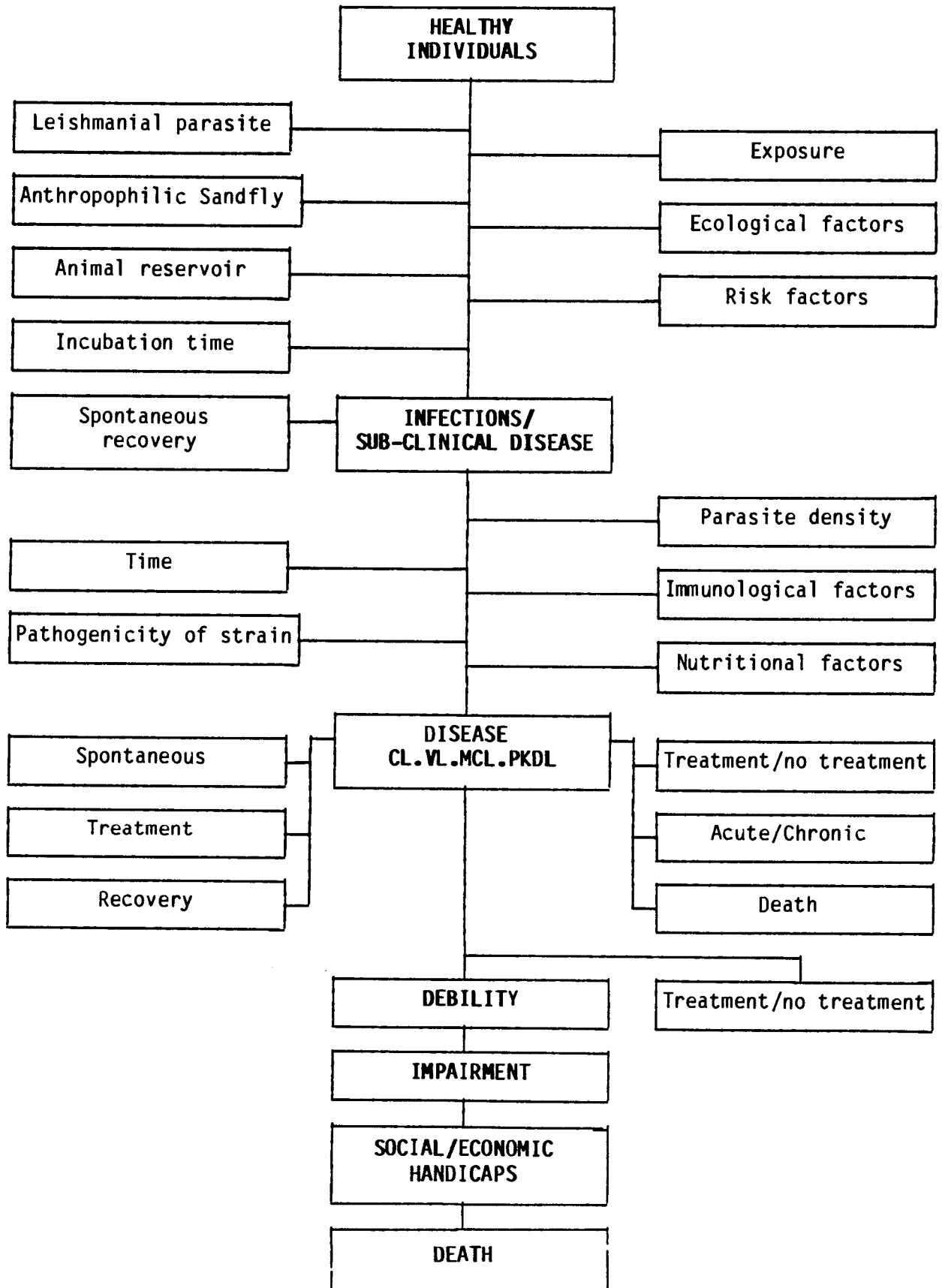
- i) the lack of complete knowledge of all the reservoir hosts associated;
- ii) some reservoirs being domestic animals and hence the reluctance for their destruction; and
- iii) the lack of economically feasible methods of their control.

It is becoming increasingly apparent that significant cultural aspects and lack of community education on the disease need to be addressed to, if the above listed control measures are to be practiced as a viable approach.

5. The affected populations

- a) The leishmaniases essentially affect poor rural communities.
- b) Most sufferers belong to the economically viable age groups of populations.
- c) Generally more males are affected and a strong association with occupational exposure is evident.
- d) For instance, in Ethiopia, children (4-14 years) herding livestock show the highest prevalence of CL acquiring the infection mainly from the hyrax. In the Ethiopian southwest, the same animal reservoir is associated as the source of infection of VL for coffee growing adult men (Bray 1978).
- e) In Kenya, livestock herding nomadic populations are mainly affected with VL where sandflies breeding in termite hills and gerbil reservoirs are involved in the transmission (Mbugua and ArapSiongok, 1981) of infection.
- f) In Belize and in the Yucatan peninsula of Mexico, a form of CL, Chiclero's ulcer is acquired mainly from the forest by chicle gatherers, a major occupational group in the region
- g) In the Andean and Amazonian regions of South America where CL and MCL are common, colonisation schemes and resettlement, deforestation and cultivation of new land are known to be the reasons for widespread human infection acquired evidently from various rodent reservoirs. People involved in hunting, fishing and gathering activities are the worst affected.
- h) In Bihar and the Bengal regions of India where serious and large outbreaks of VL have occurred, farming populations were predominantly affected in apparently man-to-man transmission occurring mainly in human habitations.
- i) In Tunisia as well as in the Middle East, it appears that large scale construction programs for water resources have increased the prevalence of CL and dogs and rodents are incriminated.

6. Diagrammatic overview showing factors associated with the Leishmaniases



7. Social considerations

The following is a list of factors that need to be considered in examining socio-cultural aspects relevant to the leishmaniasis.

- a) General demography and educational status in the community including occupational survey
 - b) General health status of the community (community diagnosis)
 - c) Perceptions on modes of acquisition of leishmanial infection and attitudes towards such modes
 - d) Beliefs and practices about leishmaniasis
 - e) Patterns of behaviour of:
 - i) sub-clinical infection carriers,
 - ii) acute cases and,
 - iii) chronic cases.
- Social and community infrastructural aspects of the population, including occupations and services
- f) General comprehension level about health and disease and prevention and control, and the use of any health facilities. The idea of risk factors in leishmaniasis. Social interactions in the community.
 - g) If resettlement schemes, migrant workers or nomadic populations are involved, examine three basic levels, e.g., at point of origin, en route and at final destination; and duration of movements, frequency, etc. Recreational and leisure patterns in the community as may be related to leishmanial transmission and its impact and effects.
 - h) Possible influence of leishmaniasis on educational attainment, development and motivation of the community
 - i) Influence of leishmaniasis on household activities, e.g., child care, cooking, backyard farming productivity, etc.

8. Economic considerations

The following is a list of economy-related issues that need to be examined in relation to the leishmaniasis.

- a) Sources of income in the community and employment patterns
- b) Ownership of land and other assets
- c) Nomadic populations and sources of income/survival and productivity
- d) Access to resources, e.g., hunting, fishing, gathering
- e) Agricultural patterns in the community including schemes for mechanization, commercial enterprises, etc.
- f) Colonisation schemes, forestation and forest clearance activities, irrigation schemes and other development projects in the area.
- g) Local political and economic structure
- h) Location and distribution of houses and their design
- i) Domestic animals, livestock and other animals - distribution
- j) Existence of temporary and permanent labor pools
- l) Individual treatment costs for leishmaniasis
- m) Loss of time at school/work/home at different levels of disability/morbidity associated with the leishmaniasis.
- n) Associated losses in income/revenue and savings and investment opportunities
- o) Hospitalization costs
- p) Costs of preventive care
- q) Costs associated with animal reservoirs and their control or elimination
- r) Costs of efforts at disease control in the community

s) Priority given to leishmaniasis by:

- i) local physicians
- ii) the Health Departments
- iii) the Ministry of Health

In conclusion, it is strongly felt that research and a close examination of economic as well as socio-cultural issues relevant to the leishmaniasis would lead to greater attention by researchers and authorities towards this largely neglected group of disease.

SELECTED BIBLIOGRAPHY

1. Ayele, T. and Ali, A. (1984). Visceral leishmaniasis in Ethiopia. *Am. J. Trop. Med. Hyg.* 33(4), pp.548-552.
2. Bray, R.S. (1979), Epidemiology of leishmaniasis: some reflections on causation. Ciba Foundation Symposium 20, Elsevier, Excerpta Medica, North-Holland.
3. Convit, J.E. and Pinardi, M.E. (1974). Cutaneous leishmaniasis: Clinical and immunopathological spectrum in South America. Ciba Foundation Symposium 20, Elsevier, Excerpta Medica, North-Holland.
4. Mbugua, G.G. and Arap Siyongok, T.K. (1981). Epidemiology of Kala azar in Kitui and Meru districts. Proceedings of the 2nd Annual Medical Conference, Nairobi, Kenya. Africa Book Services (EA) Ltd., Nairobi, Kenya.
5. Tropical Diseases Research-TDR (1985). Seventh Programme Report; Chapter 12 - Social and Economic Research; Chapter 7 - The Leishmaniasis. World Health Organization, Geneva, Switzerland.