

WORLD HEALTH ORGANIZATION
Regional Office
for the Eastern Mediterranean
ORGANISATION MONDIALE DE LA SANTE
Bureau regional de la Mediterranee orientale



مَنْظَرَةُ الصِّحَّةِ الْعَالَمِيَّةِ
الكَتَابِ اَلْاِقْسَامِي
لشَرْقِ الْبَحْرِ الْمَتَوَسِّطِ

REGIONAL COMMITTEE FOR THE
EASTERN MEDITERRANEAN

Fortieth Session

Agenda item 10(a)

EM/RC40/7
June 1993

ORIGINAL: ARABIC

Technical Paper

LEISHMANIASIS

CONTENTS

	<u>page</u>
1. Introduction	1
2. Public health importance of leishmaniasis	1
3. Factors affecting the spread of leishmaniasis	2
4. Epidemiology of leishmaniasis	3
4.1 Causative agent	3
4.2 Vectors	5
4.3 Reservoir hosts	6
5. Clinical aspects	8
5.1 Visceral leishmaniasis (Kala-Azar)	8
5.2 Cutaneous leishmaniasis	9
6. Diagnosis	10
7. Review of leishmaniasis in the Eastern Mediterranean Region	10
7.1 Visceral leishmaniasis	10
7.2 Cutaneous leishmaniasis	12
8. Prevention and control of leishmaniasis	16
8.1 Case detection and treatment	16
8.2 Control of sandflies and protection from their bites . .	17
8.3 Control of reservoir hosts	18
8.4 Integrated approaches	19
8.5 Health education and training	19
9. Organization and management of national leishmaniasis control programmes	19
9.1 Identification of the problem	20
9.2 Definition of objectives and targets	20
9.3 Approaches	21
9.4 Training	21
9.5 Monitoring and evaluation	22
9.6 Research	22
10. WHO collaborative activities in leishmaniasis control	23
11. Conclusions	23
12. Recommendations	24

ABBREVIATIONS

The following abbreviations are used in this report:

ACL	anthroponotic cutaneous leishmaniasis
AVL	anthroponotic visceral leishmaniasis
CL	cutaneous leishmaniasis
DCL	diffuse cutaneous leishmaniasis
ELISA	enzyme-linked immunosorbent assay
LR	leishmaniasis recidivans
PKDL	post-kala-azar dermal leishmaniasis
VL	visceral leishmaniasis
ZCL	zoonotic cutaneous leishmaniasis
ZVL	zoonotic visceral leishmaniasis

Technical Paper

LEISHMANIASIS

Agenda item 10(a)

1. Introduction

Leishmaniases are a group of globally widespread parasitic diseases of multifaceted clinical manifestations (cutaneous, mucocutaneous, diffuse cutaneous and visceral). It is caused by several species belonging to the genus *Leishmania* - flagellate protozoa transmitted exclusively by the bite of the female phlebotomine sandfly.

Over the last few decades, it has become clear that leishmaniasis is a growing public health problem in Member States of the Eastern Mediterranean Region (EMR). The Regional Committee for the Eastern Mediterranean Region discussed the problem of leishmaniasis in 1960 and again in 1979, and two resolutions were passed asking Member States to investigate the problem and the Regional Office to support research efforts.

During the last two decades WHO has supported a large number of research activities on leishmaniasis in the Region. These studies have highlighted the considerable changes in the situation of leishmaniasis in countries of the EMR, in terms of geographical extent and incidence. A number of factors, such as the development of agro-industrial projects and the settlement of large, non-immune populations in endemic zones, large-scale migration between countries, rapid and unplanned urban expansion, environmental changes caused by dams and irrigation, and the reduction or termination of insecticide spraying for malaria, have contributed to the growing incidence and public health importance of leishmaniasis.

At the same time, evident progress has been achieved in the diagnosis, treatment, prevention and control of leishmaniasis in many countries.

2. Public health importance of leishmaniasis

For a long time the public health importance of leishmaniasis has been largely underestimated, mainly because there is not enough epidemiological information available at the country level and due to lack of awareness of its serious impact on health.

Morbidity and mortality due to leishmaniasis are on the increase. Presently, leishmaniasis is endemic in 82 countries in the world (21 in the "New World" and 61 in the "Old World"). The global prevalence is estimated at 12 million cases, and the population at risk is approximately 350 million. It is difficult, however, to make a realistic estimation of undiagnosed and unreported cases, due to the frequent absence of active surveillance and information systems in endemic countries.

There is a major difference between the number of cases actually occurring and the number reported due to several factors, including:

- the distribution of transmission sites within endemic areas is often focal;
- numerous cases are not diagnosed, some are misdiagnosed and/or not reported, especially when patients have no access to medical facilities, when diagnostic capabilities are scarce or absent, when drugs are not permanently available, or when only passive case detection is made; and

a substantial proportion of infections are asymptomatic, with clinical cases representing only the "tip of the iceberg".

The cost of leishmaniasis, direct and indirect, is extensive. Treatment of leishmaniasis is rather expensive, particularly as the affected population groups are usually those of low socioeconomic status, with very limited resources. The first-line treatment with a course of pentavalent antimonials costs between US\$60 and US\$120, to which the cost of delivery must be added. Cases that do not respond to antimony drugs require treatment with second-line drugs of much higher cost, such as amphotericin B or pentamidine. (For further information, see section 8.1.) In some countries, the cost of treatment of existing cases may surpass the total public health budget, and they need external financial assistance to meet their drug requirements. The direct costs of leishmaniasis are not only that of drugs, but of costly and lengthy hospitalization. The indirect costs due to chronic, debilitating and incapacitating effects and the loss of wages of economically active members of the family are much greater still.

3. Factors affecting the spread of leishmaniasis

The increased importance of leishmaniasis in countries of the Eastern Mediterranean Region is due to several reasons, including agricultural development projects, population movements, rapid or unplanned urbanization, man-made environmental changes, side-effects of malaria control programmes, and socioeconomic factors. The role played by the growing spread of the human immunodeficiency virus (HIV) infection, particularly on the clinical picture, is beginning to show in areas where both infections are prevalent.

Outbreaks of leishmaniasis are often associated with agricultural development of an area, particularly the introduction of the non-immune population to zoonotic foci of infection, exposing many more to the natural vectors and increasing the risk of infection.

Military activities have also contributed to the increase in the incidence of the disease, for example during the war between the Islamic Republic of Iran and Iraq, when thousands of cases occurred among soldiers on both sides exposed to leishmaniasis for the first time. Also, a number of soldiers were infected during the Gulf War in 1991.

Fast-growing cities usually encompass neighbouring rural areas where the zoonotic cycle may occur. Also, the deterioration in social and

economic conditions in poor city suburbs, where low-income populations concentrate due to massive rural-urban migration, may result in an increase in the incidence of leishmaniasis in the area.

Population movements such as migration of people from endemic areas to areas of potential transmission can result in the spread of infection; a few outbreaks have been traced to have originated in this manner. This was probably also the cause of the occurrence of cases of *Leishmania major* in Khartoum in the late 1980s.

An increase in the number of leishmaniasis cases has been reported in areas with man-made environmental changes favouring the transmission of anthroponotic cutaneous leishmaniasis (ACL), such as, for example, the building of dams resulting in an increase in soil humidity, and garbage collection around houses promoting the breeding of sandflies.

One of the important factors contributing to the flare up of leishmaniasis cases in some endemic areas has been the reduction of insecticide spraying for malaria control. After years of successful malaria control, which lead to the reduction of a number of cases of malaria, several countries now face a serious resurgence of cases after reducing or terminating insecticide spraying.

4. Epidemiology of leishmaniasis

Leishmaniasis in the Old World represents a disease complex with varied transmission sites in which leishmaniasis transmission is highly dependent on the ecology. Most leishmaniasis are zoonotic, and humans are infected only accidentally when exposed to the natural transmission cycle. However, in the anthroponotic forms, humans are believed to be the unique reservoir host.

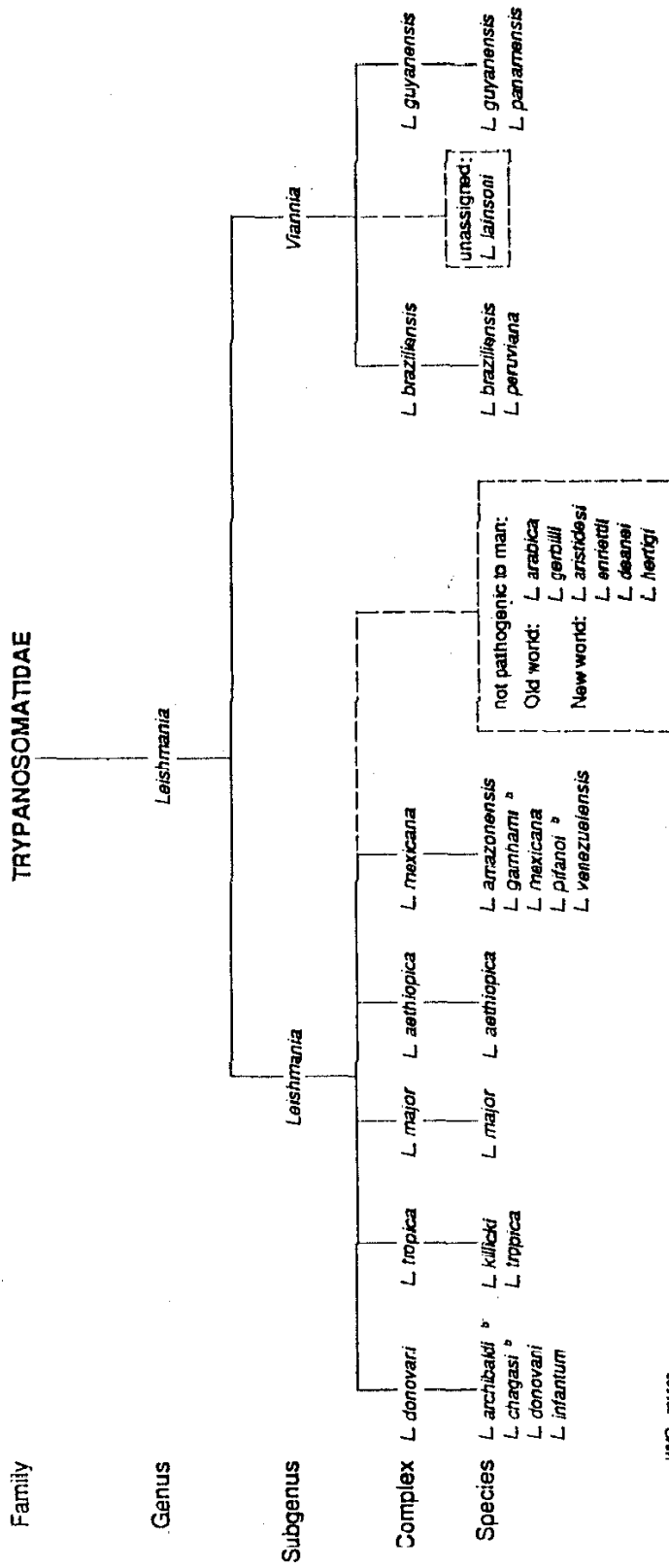
The various species of *Leishmania* are transmitted by sandflies. The sandfly becomes infected when taking blood from reservoir hosts. Amastigotes, liberated from the host cell in the insect's gut transform into promastigotes, which multiply there and finally pass forward into the pharynx and buccal cavity, from which they are introduced into a new host when the sandfly feeds again.

4.1 Causative agent

At least 20 species of *Leishmania* are pathogenic to humans. It is essential to know the identity of the parasites in each focus, since this knowledge has implications for control and treatment. The taxonomy of the species of mammalian *Leishmania* is given in **Figure 1**.

The most widely used laboratory method of identification is analysis of isoenzymes by electrophoresis. The use of specific DNA (deoxyribonucleic acid) probes and monoclonal antibodies has shown to be potentially useful for the rapid identification of species without having to isolate parasites in culture.

Fig. 1. Taxonomy of *Leishmania*^a



^aThe classification of genera and subgenera is based on extrinsic characters, and that of the complexes mainly on intrinsic characters (isoenzymes).
^bSome workers do not consider these to be separate species.

The genus *Leishmania* is divided into two subgenera on the basis of the development in sandflies. Within the subgenera, presumptive identification is based on extrinsic characteristics (e.g., clinical manifestations, characteristics in culture), but definitive identification at the species level is usually done by biochemical methods, in comparison with reference strains.

Knowledge of the identity of the parasite is essential and valuable epidemiological information. When the species is known, sound working hypotheses on the disease and the probable structure of the focus can be predicted.

4.2 Vectors

The only identified vectors of leishmaniasis are sandflies of the genus *Lutzomyia* in the New World and *Phlebotomus* in the Old World. Sandflies are abundant all year round in tropical areas and during the summer in temperate zones. More than 500 species and subspecies are known throughout the world, but less than 35 have proved to be vectors of human leishmaniasis.

The haematophagous sandfly females feed all during the night, but especially at dusk. However, they can also bite during the day when disturbed in their resting places. The insect absorbs the *Leishmania* parasites with blood from an infected host. The parasites' life-cycle in the sandfly is four to seven days, after which the parasites can be inoculated in another animal or human when the sandfly takes a new blood meal. The sandfly breeding sites remain largely unknown, although some have been identified, such as rodent burrows, tree trunks and organic debris.

The frequency of blood-feeding and the range of hosts upon which a female sandfly feeds influence the circulation of the parasites. Some species of sandflies never feed more than once in each gonotrophic cycle, which takes about six days. Others will feed two or more times during the same period. This leads to close contact with reservoir hosts and humans and more intense transmission. Species of sandflies that bite a wide range of hosts will frequently feed on animals that play no part in the maintenance of the parasite. Others that feed almost exclusively on only reservoir hosts and humans are more dangerous vectors.

In many of the foci of leishmaniasis in the Eastern Mediterranean Region, the vectors are now known. In the few foci where they are not, typing of parasites from patients and detailed inventories of the sandfly fauna will give some indication of the probable vectors (**Table 1**).

The time when infection is acquired is related to the dynamics of the vector population. The maximum transmission is at the time when the proportion and absolute number of "old-age" sandflies are at their highest.

Table 1
Vectors of *Leishmania* in the Old World

Parasite	Proven vectors	Probable vectors	Possible vectors
<i>L. donovani</i>	<i>P. alexandri</i> <i>P. martini</i> <i>P. argentipes</i>	<i>P. orientalis</i>	<i>P. causicus</i> <i>P. mongolensis</i> <i>P. celiae</i> <i>P. vansomerena</i>
<i>L. infantum</i>	<i>P. ariasi</i> <i>P. perfiliewi</i> <i>P. perniciosus</i>	<i>P. kandelakii</i> <i>P. langeroni</i> <i>P. neglectus</i> <i>P. smirnovi</i> <i>P. chinensis</i> <i>P. longiductus</i>	<i>P. longicuspis</i> <i>P. syriacus</i> <i>P. tobbi</i> <i>P. perfiliewi</i> <i>transcau-</i> <i>casicus</i>
<i>L. killicki</i>			<i>P. papatasi</i> <i>P. alexandri</i> <i>P. chabaudi</i>
<i>L. tropica</i>	<i>P. sergenti</i>		<i>P. saevus</i>
<i>L. aethiopica</i>	<i>P. longipes</i> <i>P. pedifer</i>		
<i>L. major</i>	<i>P. duboscqi</i> <i>P. papatasi</i>	<i>P. salehi</i> <i>P. alexandri</i> <i>P. ansarii</i>	<i>P. bergeroti</i> <i>P. andrejevi</i> <i>P. causicus</i> <i>P. mongolensis</i> <i>P. sergenti</i>

The behaviour of the vector and its optimal habitat determines the place where the majority of patients become infected. There are always some places that seem to favour the vector and which are, therefore, more dangerous. Another important factor is whether or not the vector enters houses to feed (endophagic) or feeds primarily outdoors (exophagic). Places of infection are also affected by the distance of dispersal of the vector. The distance likely to be covered by sufficiently infected sandflies to be of epidemiological importance is probably only about 1.5 km.

4.3 Reservoir hosts

Most leishmaniases are zoonoses of wild or domestic animals. A leishmania species in a given area is usually maintained by a single reservoir host, even if other mammals may sometimes be infected.

Dogs are the main reservoir hosts of visceral leishmaniasis (VL) caused by *L. infantum*. Foxes and jackals are also infected, but since

they are not as numerous as dogs, they are less important. They are, however, a constant source of reinfection in the dog population. Very occasionally, *L. infantum* has been isolated from the brown rat *Rattus rattus*. In spite of the positive results, it is extremely unlikely that black rats are responsible for the maintenance of VL foci.

All evidence points to human-to-human transmission of anthroponotic cutaneous leishmaniasis (ACL) caused by *L. tropica*. However, the prevalence of infection in humans is sometimes so low that it seems that there may also be an animal reservoir. Dogs are considered to be "accidental" hosts.

In all Asian and North African foci of zoonotic cutaneous leishmaniasis (ZCL), gerbils are the main reservoir hosts. In the Islamic Republic of Iran and probably northern Afghanistan, the gerbil is *Rhombomys opimus*. *Psammomys obesus* is a reservoir in Jordan, the Libyan Arab Jamahiriya, eastern Saudi Arabia, the Sinai desert, the Syrian Arab Republic and Tunisia. In Morocco, *Meriones shawi* is the reservoir host, and in other countries, other species of *Meriones* have been found infected.

A summary of reservoir hosts of leishmaniasis is in **Table 2**.

Table 2

Reservoir hosts of leishmaniasis in the Eastern Mediterranean Region

Species	Reservoir hosts
<u>Cutaneous leishmaniasis</u>	
<i>L. major</i>	<i>Rhombomys opimus</i> , <i>Psammomys obesus</i> , <i>Meriones libycus</i> , <i>M. crassus</i> , <i>M. shawi</i> , <i>M. hurrianae</i> , <i>Mastomys erythroloaeucus</i> , <i>Arvicanthis niloticus</i> , <i>Nesokia indica</i> , <i>Xerus rutilus</i>
<i>L. tropica</i>	Dogs, humans
<i>L. arabica</i>	<i>Psammomys obesus</i> , dogs
<i>L. infantum</i>	Dogs, <i>Rattus rattus</i> , foxes, jackals
<u>Visceral leishmaniasis</u>	
<i>L. donovani</i>	Dogs, humans, <i>Arvicanthis niloticus</i> <i>Acomys albigena</i> , <i>Rattus rattus</i> , <i>Felis serval</i> , <i>Genetta genetta</i> .
<i>L. infantum</i>	Dogs, <i>Rattus rattus</i> , foxes, jackals

Humans are directly involved in two groups of the disease: visceral leishmaniasis caused by *L. donovani* and cutaneous leishmaniasis caused by *L. tropica*. In visceral leishmaniasis, caused by *L. donovani*, post-kala-azar dermal leishmaniasis (PKDL)--an active source of sandfly contamination--should be actively sought and duly treated (see section 5.1). The same goes for recurrent forms of cutaneous leishmaniasis caused by *L. tropica*. In addition to the case of *L. major* leishmaniasis, mentioned above, humans can act as a reservoir in a number of strictly cutaneous forms caused by *L. infantum*, because of the lingering nature of the lesions. Here again, rapid and prolonged treatment is necessary to exclude humans from any transmission cycle. Finally, a mixture of several *Leishmania* species can coexist in a single focus, causing clinical forms which seem identical but occur in different epidemiological cycles. On the Arabian Peninsula, for example, *L. donovani* and *L. infantum* are to be found together in foci, the former only in humans, the latter in humans and dogs. This highlights the need for exact identification of the parasites (isoenzymes) before action is taken.

5. Clinical aspects

5.1 visceral leishmaniasis (Kala-Azar)

Visceral leishmaniasis (VL) or "Kala-Azar" is characterized by irregular fever, malaise, loss of weight, splenomegaly, sometimes hepatomegaly and/or lymphadenopathies.

Most patients are infants and children, although cases are seen in adults. Subclinical cases of infection have been reported from various countries. The incubation period is five to six months, with a range of one month to two years, but cases have been reported with incubation periods of up to nine years. The onset may be abrupt (mainly in younger children), or gradual. In a matter of two to three weeks to several months, the complete features of the disease are established with permanent or intermittent fever, swelling of the abdomen, haemorrhages and rarely jaundice. Cough and diarrhoea are frequent in some cases.

Commonly, in Sudan a cutaneous module or ulcer, or a mucosal lesion may be present, containing leishmanial parasites. Signs of malnutrition (oedema skin and hair changes) and cachexia are developed with progressive emaciation and weakness. Intercurrent infections such as pneumonia, dysentery and pulmonary tuberculosis may complicate the disease.

Laboratory findings consist of anaemia (normocytic, normochromic), with very low haemoglobin, leucopenia with marked decrease in neutrophil count, thrombocytopenia, increase in globulins and decrease of serum albumin. Other laboratory findings are related to the involvement of organs and complications of the disease.

Asymptomatic infections and subclinical forms of the disease are frequent and outnumber clinical cases 5 to 1, or more. Asymptomatic leishmania-infected persons develop the clinical illness more readily in certain circumstances, such as co-infections with HIV or other immunosuppressive conditions.

In most acute infections, death may occur within a few weeks; in less acute cases, within a year; and in chronic cases, from two to three years. Yet there are probably many asymptomatic individuals who recover spontaneously.

After recovery, patients may develop a chronic form called post-kala-azar dermal leishmaniasis (PKDL) relevant to transmission, since the nodular lesions contain abundant parasites. It has been observed most often in India, but has been noted also in other endemic areas. The rash consists of hypopigmented nodules that may occur anywhere on the body, especially the upper trunk, arms, thighs, forearms, legs, abdomen and neck. Later nodules appear mostly on the face, especially on the nose, chin, cheek, lips, forehead and ears. The clinical appearance may resemble that of lepromatous leprosy.

5.2 Cutaneous leishmaniasis

Cutaneous leishmaniasis (CL), usually a self-healing ulcer, but a lifelong aesthetic stigma can result from multiple lesions (sometimes more than 100) with disabling and disfiguring scars. Its most severe form, *Leishmaniasis recidivans* (LR), can be particularly destructive and disfiguring if left untreated.

Cutaneous leishmaniasis in the Region is seen in two clinical forms, dry and wet.

The dry type is mostly seen in anthroponotic cutaneous leishmaniasis (ACL), while the wet type is the one usually associated with *L. major* and zoonotic cutaneous leishmaniasis (ZCL). However, there is a great deal of overlap. Many cases of ZCL are of the dry type and some cases of ACL are of the wet type.

In addition to ACL and ZCL, there are some cases of cutaneous lesions due to *L. infantum* that have been reported from countries in North Africa.

The incubation period for ZCL is a few weeks to several months; for ACL, the incubation period is longer (two months to one year or more).

The duration of the disease is two to eight months for ZCL and three to more than 24 months for ACL.

Apart from the two types described above, there are many unusual types of cutaneous leishmaniasis. Some of the more common unusual forms are: abortive form, nodular form, impetiginous form, verrucoid form, psoriasiform, erysipeloid form, non-healing form, lupoid or tuberculoid form and mucocutaneous form.

Diffuse cutaneous leishmaniasis (DCL) occurs in individuals with defective cell-mediated immune response.

Its severity is due to disseminated lesions that resemble those of lepromatous leprosy, which never heal spontaneously and tend to relapse after treatment. Because of the devastating consequences to the patient, it is recognized as a special public health problem.

6. Diagnosis

Diagnosis of leishmaniasis is based on clinical, serological and parasitological identification.

Clinical signs and symptoms alone, or in combination, are not sufficiently specific to differentiate visceral leishmaniasis (VL) from malaria and other generalized infections. For parasitological confirmation, serological examination is the easiest and most efficient screening procedure. Simple and reliable tests are available such as the direct agglutination test (DAT) and the dot-enzyme-linked immunosorbent assay (dot-ELISA), which are appropriate for use in peripheral health centres and under field conditions. Confirmation of diagnosis by demonstration of the parasite in spleen, bone-marrow or lymph gland aspirates is a prerequisite for treatment. Spleen aspiration, however, requires strict precautions and should be practised only by experienced medical personnel.

Diagnosis of cutaneous leishmaniasis (CL) however is based on the demonstration of the parasite. Material for parasitological diagnosis can be obtained by the scraping of lesions, slit-smear, needle biopsy, or full-thickness biopsy. The materials thus obtained are used for microscopical examination, culture and animal inoculation.

7. Review of leishmaniasis in the Eastern Mediterranean Region

Leishmaniasis is an important public health concern in six countries of the Region, namely in the Islamic Republic of Iran, Iraq, Saudi Arabia, Sudan, the Syrian Arab Republic and Tunisia. It also exists, to a lesser degree, in Afghanistan, Egypt, Jordan, Lebanon, the Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Somalia and Yemen. And in Bahrain, Kuwait, Qatar and the United Arab Emirates only a few cases, mostly imported, have been reported.

In most of the countries, information on the epidemiological features is incomplete. However, some countries of the Region have stable endemic foci, which could cause epidemics. There are also some silent foci that are considered a constant danger for increased prevalence and new foci where leishmaniasis has never been recorded before.

The three principal forms of leishmaniasis in the Region are visceral leishmaniasis (VL), zoonotic cutaneous leishmaniasis (ZCL) and anthroponotic cutaneous leishmaniasis (ACL). Also, some cases of cutaneous forms due to *L. infantum* have been reported mainly from North Africa.

7.1 Visceral leishmaniasis

Sporadic cases of visceral leishmaniasis (VL) have been recorded in Afghanistan, Cyprus, Djibouti, Jordan, Kuwait, Lebanon, Oman and the United Arab Emirates. In Morocco and Tunisia, visceral leishmaniasis is endemic in the northern part of these countries, corresponding to the sub-humid bioclimatic zone along the Mediterranean coast.

In the **Libyan Arab Jamahiriya**, a few cases have been reported in the Benghazi area, and foci of infection exist in the south and south-east of the country near the border with Chad.

In **Egypt**, a focus of visceral leishmaniasis was discovered in 1982 at El Agamy near Alexandria. More than 50 cases among children have been recorded so far.

In **Sudan**, the disease is a public health problem. The main endemic area is the eastern and central parts of the country from Malakal in the south to Kassala in the north-east. Several active foci are found in the western part (El Fasher and El Nahud) and in the south (Kapoeta). In the majority of foci, the disease is endemic. An increase in the occurrence to epidemic proportions has been reported during the last few years, especially in southern Sudan.

In **Somalia**, visceral leishmaniasis is endemic along the Shebelle and Juba river basins in the southern part of the country.

In **Saudi Arabia**, the disease is endemic in the south-western part of the Asir mountains, especially in Tihama and Gizan, in the areas adjoining Yemen. Sporadic cases of visceral leishmaniasis are registered in **Yemen** along the Tihama coastal plain, but the main foci are Charaab and Qobeita in Taiz governorate.

In **Oman**, the disease is almost confined to the mountainous areas of the north. In the **United Arab Emirates**, cases are registered in Fujairah (the eastern Emirate).

Several cases have been reported in **Jordan** from Aqaba, Karak and Irbid. In **Lebanon**, sporadic cases were recorded in the western part of the country near the sea coast. Foci of infection are registered in the north-west of the **Syrian Arab Republic**, mainly Kessab, Idlib, Latakia and Tartous.

In **Iraq**, the main focus of transmission is in central Iraq and in the Greater Baghdad area.

The most highly endemic areas in the **Islamic Republic of Iran** are in the province of Fars in the south and the districts of Meshkin-Shahr and Moghlan in the north-west.

In **Pakistan**, visceral leishmaniasis has been mostly reported from the north (Baltistan), from Azad Jamu and Kashmir, parts of northern Punjab, and the adjacent regions in the North-West Frontier province.

The causative agent identified in the majority of foci in the **Eastern Mediterranean Region** is *L. infantum*. In Sudan, Iraq and Saudi Arabia the parasite is mainly *L. donovani*. In some countries, the parasite has not been identified, or has been identified only among animal reservoirs (dogs) and is suspected to be also responsible for human cases.

The role of the dog as a visceral leishmaniasis reservoir is well established, with *L. infantum* as the parasite species. In the Islamic

Republic of Iran, Iraq, the Syrian Arab Republic and Sudan, wild canines (jackals and foxes) are considered a reservoir of visceral leishmaniasis. Three rodent species (*Arvicanthis niloticus*, *Acomys albigena* and *Rattus rattus*) and two carnivores (*Genetta genetta* and *Felis serval*) were claimed to be infected with *L. donovani s.s.* in Sudan.

Several species of sandflies are vectors of visceral leishmaniasis (**Table 3**). Their seasonal activity extends from April to November, with the peak period for transmission from June to September.

7.2 Cutaneous leishmaniasis

Zoonotic cutaneous (ZCL) and anthroponotic cutaneous (ACL) forms of leishmaniasis are found in most countries of the Region. In some countries, there are longstanding endemic foci, some of which erupt into endemic proportions. In others, there are apparently silent foci, which are considered a constant danger.

The causative agents identified in most of the foci of infection are *L. major* and *L. tropica*. *L. infantum* is responsible for sporadic cutaneous leishmaniasis cases in Cyprus and Tunisia.

Phlebotomus papatasi is the proven vector of *L. major* and *P. sergenti* is the suspected vector of *L. tropica* in the majority of endemic foci. However, some other species of sandflies have also been found to take part in the transmission cycle (**Table 4**).

Proven reservoirs of *L. major* are the rodents *Rhombomys opimus*, *Psammomys obesus* and *Meriones* spp. Natural infection with *L. major* was demonstrated in *Arvicanthis niloticus* in Sudan, *Tatera indica* in the Islamic Republic of Iran and Pakistan, and *Nesokia indica* in the Islamic Republic of Iran.

Comprehensive information about the distribution of zoonotic cutaneous leishmaniasis (ZCL) in many countries is incomplete and needs more epidemiological studies. Anthroponotic cutaneous leishmaniasis (ACL) is confined to urban settlements often at the periphery of old towns and cities. The distribution of main foci of infection is summarized in **Table 5**.

Table 3.

Spread of visceral leishmaniasis and vectors in EMR Member States

	Forms		Main species of <u>Phlebotomus</u> vectors																				
	ZVL	AVL	chinensis	kandelakii	major	alexandri	orientalis	perfiliewi	tbibi	langeroni	halapensis	papatasi	syriacus	longicuspis	perniciosus	arasi	longiductus	arabicus	celiae	martini	bergeroti	gallaus	
Afghanistan	+	?	x	x	x																		
Cyprus	++					x		x	x														
Djibouti		+				x	x															x	
Egypt	++									x													
Iran	++		x	x	x	x					x												
Iraq		++				x						x											
Jordan	+	?				x			x				x										
Kuwait		+																					
Lebanon	+												x										
Libya	++?													x	x								
Morocco	++													x	x	x							
Oman	+	?				x					x												
Pakistan	++	+	x	x		x											x						
Saudi Arabia	+	++	x			x	x											x					
Somalia		++?					x												x	x			
Sudan	+	+++					x														x		
Syria	++?							x		x		x											x
Tunisia	++							x						x	x								
U.A.E.	+	?				x																x	
Yemen	++	+				x	x											x					
Palestine	+											x											

? = Parasite in humans has not been identified.
 ++ = Endemic foci.
 x = Presence of sandflies in the country.
 + = Sporadic cases.
 +++ = Epidemic proportion.
 ZVL = Zoonotic visceral leishmaniasis.
 AVL = Anthroponotic visceral leishmaniasis.

Table 4.

Parasites, vectors and reservoir hosts of cutaneous leishmaniasis
in EMR Member States

	Parasite			Main species of vector							Reservoir host						
	L. major	L. tropica	L. infantum	papatasi	tobbi	sergenti	salehi	apatasi	dubosrqi	saevus	Rhombomys opimus	Psammomys obesus	Meriones spp.	Tatera indica	Nesokia indica	Rattus rattus	Arvicanthis niloticus
Afghanistan	+	+		+		-					+		+				
Cyprus	?	?	+		+												
Djibouti	?	?	?	+		+											
Egypt	+			+								+	+				
Iran	+	+		+		+					+		+	+			
Iraq	+	+		+		+					+					+	
Jordan	+			+								+	+				
Kuwait	+	+		+													
Lebanon	?	?		+													
Libya	+			+								+	+				
Morocco	+	+		+		+							+				
Oman	?			+													
Pakistan	+	+		+		+	+				+		+	+			
Saudi Arabia	+	+		+		+						+	+				
Somalia	?	?															
Sudan	+							+	+								+
Syria	+	+		+		+						+					
Tunisia	+	+	+	+		+						+	+				
U.A.E.	?	?															
Yemen	+	+		+					+	+							
Palestine	+	+		+		+						+			+		

? = parasite in humans has not been identified.
+ = present in the country.

Table 5.

**Distribution of main foci of cutaneous leishmaniasis
in EMR Member States**

Member States	ZCL	ACL
Afghanistan	North of the country: provinces Fariab, Jozjan, Balkh, Samangan, Kunduz, Baghlan and Takhar	Provinces Kabul, Parawn, Herat, Kapisa, Ghazni Kandahar and Badakhshan
Cyprus		Foothill villages of the Kyrenian mountains
Egypt	East and north-east areas of the Nile Delta and Sinai	
Iran, Islamic Republic of	North-east plains of the country, province of Esfahan	Cities of Meshed, Neishapour, Teheran, Kerman and Shiraz
Iraq	Widespread throughout the country except in north and north-east	Baghdad, Mosul
Jordan	Jordan valley, Muwaqqar area near Amman	
Libyan Arab Jamahiriya	South and west of Tripoli, Beni Walid area	
Morocco	Sub-Saharan districts of Er-Rachida, Ouarzazate and Taza	Central part of the country (north of the Haut Atlas)
Pakistan	Gilgit Agency, Baluchistan, Quetta	
Saudi Arabia	Al Hassa, Hofuf area	South-western part of the country (Abha), Gizan
Sudan	Darfur, Kordofan and other provinces in centre Shendi Atbara area, White Nile area, Khartoum area	
Syrian Arab Republic	Damascus area, Dmeir	Aleppo area, Hama
Tunisia	Central and south-western parts of the country	South-eastern part of the country (Tataouine region)
Yemen	Widespread in lowlands	Main cities of Sana'a, Ibb, Taiz and Hodeida

ZCL = Zoonotic cutaneous leishmaniasis.

ACL = Anthroponotic cutaneous leishmaniasis.

8. Prevention and control of leishmaniasis

Approaches for the control of leishmaniases are determined, to a large extent, by the ecology of these diseases. The following measures are to be considered for the control of zoonotic leishmaniasis.

8.1 Case detection and treatment

Passive case detection followed by treatment and case reporting constitute the basis for a control programme and the first step towards a national strategy for control. Although only patients who are already in an advanced state of the disease will be detected, such surveillance can considerably reduce individual suffering and, at the same time, serve as a rough indicator of the local prevalence of the disease. Passive surveillance relies on awareness among the population of early symptoms and the importance of early treatment, and hence, health education campaigns can considerably improve efficiency.

Active case detection/surveillance involves regular systematic screening of clinically suspected cases through serological testing and parasitological diagnosis.

For all forms of leishmaniasis, the drug of choice is pentavalent antimony, prolonged systemic treatment being imperative. Two pentavalent antimonials are available: meglumine antimoniate and sodium stibogluconate. They are chemically similar and their toxicity and efficacy are thought to be related to their content of pentavalent antimony (Sb^{5+}); meglumine antimoniate solution contains about 8.5% Sb^{5+} (85 mg/ml), whereas sodium stibogluconate solution contains about 10% Sb^{5+} (100 mg/ml).

The initial treatment of parasitologically proven cases of visceral leishmaniasis should be based on a daily injection of 20 mg of Sb^{5+} per kg of body weight, to a maximum of 850 mg. This implies a maximum daily dose of 10 ml of meglumine antimoniate, or 8.5 ml of sodium stibogluconate. The injections are normally given for a minimum of 20 days. The injection may be given intravenously or intramuscularly for sodium stibogluconate, and intramuscularly for meglumine antimoniate.

In case of primary unresponsiveness, the second-line drugs are amphotericin B and pentamidine.

Zoonotic cutaneous leishmaniasis, with mild lesions or benign, self limiting lesions, will usually heal without treatment, leaving the person immune to further infection with that species of *Leishmania*. However, some forms of leishmaniasis, particularly with ulcerated or inflamed cutaneous lesions, with or without lymphangitis and lesions involving cartilage, can be treated by systemic pentavalent antimonials at a dose of 10-20 mg per kg of body weight given once every 24 hours until clinical and parasitological cure is achieved, and continued for a few days longer.

Lesions due to *L. tropica* should be treated to reduce the reservoir of infection. Crusts should not be removed. The use of topical antiseptics or systemic antibiotics is rarely necessary.

Some important points should be taken into consideration during the planning and implementation of such programmes:

- 1) Good results are usually achieved at the very beginning of the programme, and the incidence drops dramatically even after the first year of work. But it is more difficult to screen the remaining cases which can form the source of a new outbreak. Therefore, treatment of patients is usually supplemented by intensive control of the vectors, if possible.
- 2) Attention should be paid to atypical cases (e.g., *Leishmaniasis recidivans* cases) in which the disease may last a long time and be resistant to the usual treatment.

8.2 Control of sandflies and protection from their bites

Attempts to reduce the risk of leishmaniasis through attacking sandflies by chemical methods should be preceded by baseline data on the abundance of the target species. An analysis of changes in the vector population would then give a measure of the efficiency of the intervention.

Control by house-spraying is most likely to be effective against *P. sergenti*, the vector of anthroponotic cutaneous leishmaniasis (ACL) in the Region.

Insecticide attacks on *P. papatasi*, the vector of zoonotic cutaneous leishmaniasis (ZCL), have been shown to give little or no benefit. This species is notably adaptable and flourishes in many different habitats. In the foci of zoonotic cutaneous leishmaniasis, *P. papatasi* rests and breeds in enormous numbers in the burrows of gerbils. It disperses several kilometres away from these sites, carrying the infection to humans. House-spraying, fogging and treatment of burrow entrances with insecticides have all been shown to give only temporary control, but in some cases they have no effect at all.

There is no information on the effective control by insecticides of visceral leishmaniasis caused by *L. infantum* which is known or suspected to be transmitted by subgenus *Larrousius*. These sandflies bite and rest both indoors and outdoors. Because of this behaviour, attacking these sandflies by house-spraying or fogging is unlikely to have much effect on the circulation of the parasite. Furthermore, with visceral leishmaniasis caused by *L. infantum*, the incidence of overt disease in the human population is low, and such intervention would not be cost-effective.

However, house-spraying may be effective for vectors such as *P. smirnovi* or *P. longiductus*, which are either endophilic or strongly attracted into houses by light. The results of any such intervention should be carefully evaluated.

Short-term personal protection against sandfly bites is possible by the use of commercially available repellents. The cost and the need to use constantly the repellent, mean that this can be recommended only for visitors to endemic areas, particularly tourists.

The risk of infection to babies can be reduced by protecting them from sunset to sunrise with mosquito nets. Adults, however, are at greatest risk immediately after sunset.

Preliminary observations on the effect of the use of permethrin-impregnated curtains suggest this method may be useful in controlling some forms of leishmaniasis.

8.3 Control of reservoir hosts

Reservoir control requires precise knowledge of their ecology and habits of the hosts. It is usually undertaken as part of an integrated programme for the control of a particular type of leishmanial disease in a particular focus. The activities involved in implementing control programmes vary according to the species of *Leishmania* involved and consequently its reservoir in the focus. Basic information on the structure of the focus, especially on the ecology of the reservoir host, is essential for the success of any control programme.

Control of leishmaniasis through the control of reservoir hosts is recommended for zoonotic visceral leishmaniasis and zoonotic cutaneous leishmaniasis.

The control measures vary according to the reservoir:

- Humans are considered to be the source of visceral leishmaniasis caused by *L. donovani* and cutaneous leishmaniasis caused by *L. tropica*. Active case detection and treatment, accompanied by measures for preventing reinfection, depending upon the coverage achieved, should reduce or eliminate the parasite load and reduce transmission.
- Dogs, jackals and foxes are the reservoirs of zoonotic visceral leishmaniasis caused by *L. infantum*. The most effective measures to reduce the populations of these animals are by environmental modifications, including reduction of access to food sources and by poisoning. It is not known to what extent dog populations must be reduced to eliminate or control the parasites. In those countries where facilities are available, and it is culturally acceptable, a system of dog registration may enable periodic check-ups of dogs to eliminate those positive for leishmaniasis.
- Rodents are important reservoir hosts of zoonotic cutaneous leishmaniasis. Several serious attempts have been made to control them. The approach differs according to the type of rodent involved.

In areas where *Rhombomys opimus* (great gerbil) is involved, destruction of its burrow system by ploughing with a subsoil plough, followed by monitoring activities to prevent reinfestation, have proved to be very effective. This can be accompanied by planting the area with some trees or agricultural development. Another approach is to poison the rodent with anticoagulants and zinc phosphide.

Methods for the control of *Psammomys obesus* have not been properly developed. This rodent feeds exclusively on chenopodiaceae plants, and this has led to the suggestion that removal of the chenopod plants, where applicable, may be a simple and effective method to get rid of the rodent. The destruction of wild chenopodiaceae must be limited to selected protected areas, up to 1-2 km from dwellings, since these plants are often part of the natural pasturage. Environmental changes due to agricultural development will, in the long term, lead to the control of this rodent.

Meriones spp. are controlled by poisoning with "Klerat", or using anticoagulants and zinc phosphide. In zones where there are human dwellings, regular collection of household rubbish, filling in of rubbish pits and mechanical destruction of burrows followed by land use are all effective techniques.

8.4 Integrated approaches

In most instances, no single measure can be effective to reduce the transmission. Several approaches must be used, such as passive or active case detection and treatment of patients, vector and reservoir host control, environmental management and personnel protection.

There are many examples in which leishmaniasis control has been integrated with control of malaria. Control of stray dogs as part of rabies control and other purposes and control of agricultural rodent pests can effectively contribute to the control of some forms of leishmaniasis.

8.5 Health education and training

Subjects on leishmaniasis protection and control should be included in health education programmes, especially in areas with endemic foci. Health education is an important element in ensuring community participation in leishmaniasis control. To achieve the long-term commitment of a community, its members must have a clear understanding of the advantages they may expect to gain individually from the control measures envisaged.

Medical personnel in endemic areas should learn, in detail, the distribution and clinical features of leishmaniasis in the areas of their responsibility. Diagnosis and treatment require special training, with particular emphasis on the importance of laboratory facilities. Knowledge of the ecology and of control measures is essential. The recording and reporting of leishmaniasis cases should be particularly strengthened.

Laboratory technicians assigned to diagnose cases require specific training in the microscopy and serology of leishmaniasis.

9. Organization and management of national leishmaniasis control programmes

To be able to meet the needs of national authorities for the prevention and control of leishmaniasis, it is essential to have national plans with clear objectives, targets, approaches and activities. The plan should be adopted and become part of the national health policy.

Government acceptance of a control programme, and of its budget, implies political and administrative commitment to control leishmaniasis.

The six steps involved in the preparation of such a plan include the following.

9.1 Identification of the problem

In the majority of countries, some epidemiological information on leishmaniasis is available. Even if out of date or incomplete, such information can help in the designing of a control programme.

As a first step, an analysis of the known geographical distribution is to be made. This, together with the most recent population census data, will make it possible to establish a rough estimate of the population at risk. A review of available resources at endemic foci, and nationally, is important. This includes trained human resources, laboratory services, information system, etc.

9.2 Definition of objectives and targets

National programmes require thorough and clear definition of their objectives. These objectives should be elaborated on the basis of a realistic assessment of available resources and of minimum requirements for control.

The objectives can be subdivided into immediate, medium term and long term.

Immediate

- provide facilities for adequate diagnosis and treatment of cases at primary health care level;
- treat patients suspected of having leishmaniasis on the basis of clinical signs.

Medium term

- clarify the epidemiological features and geographical distribution of leishmaniasis.

Long term

- prevention and control of leishmaniasis.

Targets are meant to be quantifiable, for example, the establishment of laboratory services at both central and peripheral levels within one year.

9.3 Approaches

Approaches for the control of leishmaniasis are determined by the type of disease present, the magnitude of the problem and the resources available. The approaches include: case detection and treatment, control of the vector and of the reservoir, and measures to ensure community participation (see section 8).

In all circumstances and in all foci of leishmaniasis, passive surveillance is the simplest approach, it is relatively inexpensive and easy to fit into the existing health services at all levels. Passive case-detection, followed by treatment and case reporting, should constitute the basis of a control programme and the first step towards a national strategy for control.

The effectiveness of passive medical surveillance can be improved considerably by the training of health staff in methods of diagnosis, through introduction of serological tests for diagnosis and efficient health education.

Decisions on the necessity for control of vectors or animal reservoir hosts should be based on sound epidemiological data incriminating vectors and reservoir hosts.

A national control programme usually involves several sectors such as health, agriculture and environment. A suitable arrangement to ensure effective coordination between all national sectors involved in the implementation of the programme is necessary for its proper functioning. Therefore, a national coordinating body or advisory committee needs to be established in which all sectors concerned should be represented. It is recommended that the committee include a dermatologist, an internist, a malariologist, a veterinarian, a mammologist, a parasitologist, and an entomologist, as well as representatives from rural development projects.

It is important that one assigned officer at the Ministry of Health be given specific responsibility for the coordination of various elements of the programme, including evaluation. The national coordinator should identify the role to be played by various workers involved at all levels. He or she should also provide them with technical advice and keep them informed of developments, progress and of any changes in plans and policy, and should ensure an adequate flow of supplies (reagents, drugs, insecticides). The national coordinator should also be responsible for programme evaluation, and should report results regularly to the committee and to any appropriate regional organization concerned, and he or she should help to establish links with neighbouring countries.

9.4 Training

Training is a very important element to ensure proper implementation of the national plan and to increase the chances of success. It is envisaged for:

1. Physicians and other medical personnel in endemic areas to be trained to recognize the clinical features of the disease and to

treat patients. Community health workers should be trained to identify suspect cases and to refer them to a physician who can arrange for laboratory diagnosis.

2. Laboratory technicians require specific training in the microscopy and serology of leishmaniasis. If a comprehensive programme is envisaged, parasite isolation by culture and animal inoculation should also be included in their training.
3. Entomologists and rodent control officers assigned to collaborate in the leishmaniasis control programme need special training courses to become familiar with these activities.
4. Field workers should be trained to detect cases and to follow-up control activities.
5. Epidemiologists in such programmes need to be trained to evaluate control activities.

A manual for field personnel describing current control techniques should be prepared in a language appropriate to the potential users and should be distributed in the form of a preliminary document.

9.5 Monitoring and evaluation

Monitoring and evaluation are essential components of programme planning and management. They provide a systematic assessment of the relevance, adequacy, efficiency, effectiveness and impact of planned interventions in achieving stated objectives.

Epidemiological data should be collected systematically using standardized forms. In addition to the number of cases and their epidemiologic characteristics, the information to be collected should include data on prevalence, sandfly and animal reservoir density, and any changes in strategy should be recorded also to be able to assess its success.

Monitoring and evaluation are facilitated through implementation of surveillance and follow-up visits to ensure the correct application of control strategies.

9.6 Research

Leishmaniasis research should be a part of any control programme, since it has a major role to play in determining strategies to be used and in assessing the success of the programme in achieving its objectives. Collaboration of universities and other research institutions is extremely important.

Efforts are needed to encourage applied research in various aspects of control and innovative approaches, relevant to existing epidemiological and socioeconomic conditions.

Continued emphasis should be placed on improving existing knowledge on the identification of leishmaniasis and sandflies. In this connection, establishment of national and regional reference centres, to serve the requests for identification of materials from peripheral levels, would be commendable.

10. WHO collaborative activities in leishmaniasis control

WHO continues to collaborate with Member States where leishmaniasis is a public health problem, in planning, implementation and evaluation of national control activities.

Technical support in helping to elucidate the epidemiology of leishmaniasis and its control has been provided by WHO to Afghanistan, Egypt, Jordan, Libyan Arab Jamahiriya, Oman, Morocco, Saudi Arabia, Syrian Arab Republic and Tunisia.

In addition, WHO has supported national training of public health and vector control personnel in countries of the Region, and has facilitated training abroad in advanced technologies at leading research laboratories and centres.

A regional training course on leishmaniasis control was organized in Tunis in September 1989. Participants from seven EMR Member States, with assistance from leading world specialists in epidemiology, immunology, and rodent and vector control of leishmaniasis, studied the main epidemiological characteristics of leishmaniasis in the Region. The course has facilitated the activation of control activities in the Member States and has stimulated applied research.

The Regional Seminar on Approaches for Leishmaniasis Control (Cairo, Egypt, 21-25 October 1990) reviewed the existing situation regarding this disease in the Region and adopted the most applicable methods of control. It also assessed the need for training, strengthening of laboratory services and research.

A joint EMRO/TDR/CTD (EMRO/WHO Special Programme for Research and Training in Tropical Diseases/Control of Tropical Diseases) small-grants programme for applied research on leishmaniasis was established in 1992 in the Region, to support and stimulate research directly related to the control of different forms of leishmaniasis in the Region. To date, ten research proposals have been supported. They are mainly associated with ongoing control programmes in countries where leishmaniasis is a public health problem.

11. Conclusions

1. Leishmaniasis continues to be an important public health problem in some countries of the Region. Control of *Leishmania* infections is complicated by the existence of many species of sandflies and rodents as potential vectors and reservoir hosts. Some improvement in surveillance and reporting has been noted in several countries of the Region, in addition to field research and training of personnel. This has resulted in better knowledge about the geographical distribution and prevalence of infection in the Region.

2. Leishmaniasis, in some countries, appears to be of greater public health importance than was previously recognized. Further, the results of epidemiological studies that were carried out in a few endemic foci, cannot be extrapolated to wider areas due to the focalized nature of the transmission pattern. These results clearly indicate the necessity of further applied research for successful application of available control measures.

12. Recommendations

All Member States in the Region should:

1. Review available data on leishmaniasis. If not already prepared, every Member State where leishmaniasis is a public health problem should prepare a national programme for prevention and control. Coordination and collaboration in the planning and implementation of national leishmaniasis control programmes with other concerned ministries, universities and organizations, particularly those involved in rural and urban development, agriculture, education and information, should be strengthened.
2. Ensure permanent availability of anti-leishmania drugs in areas where leishmaniasis is endemic, and support the introduction of control measures against vectors and reservoir hosts where and when appropriate.
3. Strengthen and develop the necessary technical capabilities within the Region through training of medical and vector control personnel in control of leishmaniasis.
4. Encourage community involvement in preventive and control activities in foci of leishmaniasis.
5. Promote and support applied research to clarify the epidemiologic situation and to be able to identify local risk factors responsible for the occurrence of leishmaniasis.
6. Incorporate appropriate preventive measures in land development schemes.

Fortieth Session

Original: Arabic

Agenda item 10(a)

LEISHMANIASIS

Summary of Recommendations

It is recommended that in countries where leishmaniasis is a public health problem, Member States:

1. undertake an epidemiological assessment of leishmaniasis;
2. prepare national programmes for the prevention and control of leishmaniasis, using a multisectoral approach that involves all national authorities concerned;
3. encourage and promote community involvement in preventive and control activities, particularly in the foci of leishmaniasis;
4. ensure continued availability of diagnostic facilities and drugs in areas where leishmaniasis is endemic, and support the introduction of control measures against vectors and reservoir hosts;
5. strengthen and develop the necessary technical capabilities of medical and vector control personnel in the diagnosis, treatment, prevention and control of leishmaniasis; and
6. promote and support applied research on the epidemiology and control of leishmaniasis.

Fortieth Session

Original: Arabic

Agenda item 10(a)

LEISHMANIASIS

Summary for the Report

Leishmaniasis is recognized as an important public health problem in many countries of the Region owing to its considerable impact on morbidity and its potential to spread in epidemics that impose a heavy burden on the national health services.

There are several reasons for the increasing importance of leishmaniasis in countries of the Region, including:

- the establishment of agricultural development projects, causing the introduction of non-immune masses of population into natural foci of leishmaniasis;
- large-scale movements of populations, such as displaced persons or military personnel, resulting in the introduction of people from endemic areas into leishmania-free zones and the formation of new foci;
- the existence of concomitant malnutrition and infectious diseases, resulting in the aggravation of asymptomatic infections and sub-clinical forms of the disease;
- inadequate epidemiological knowledge of the transmission cycle of leishmaniasis in some endemic foci and consequently difficulties in the introduction of efficient control measures;
- shortages of trained personnel, inadequate surveillance, scarcity in diagnostic and treatment facilities, inefficiency of vector and reservoir host control, and inadequate cooperation between various sectors involved in prevention and control of leishmaniasis.

The presentation described the epidemiological features of different forms of leishmaniasis in the Region, approaches for control and organization and the management of national control programmes.

DRAFT RESOLUTION

REGIONAL COMMITTEE FOR THE
EASTERN MEDITERRANEAN

EM/RC40/R.
October 1993

Fortieth Session

ORIGINAL: ARABIC

Agenda item 10(a)

LEISHMANIASIS

The Regional Committee,

Having reviewed the Regional Director's report* on "Leishmaniasis";

1. **URGES** Member States concerned:

- 1.1 to undertake an epidemiological assessment of leishmaniasis in their countries;
- 1.2 to prepare national programmes for the prevention and control of leishmaniasis, using a multisectoral approach that involves all national authorities concerned;
- 1.3 to encourage and promote community involvement in preventive and control activities, particularly at the foci of leishmaniasis;
- 1.4 to ensure continued availability of diagnostic facilities and drugs in areas where leishmaniasis is endemic, and support the introduction of control measures against vectors and reservoir hosts;
- 1.5 to strengthen and develop the necessary technical capabilities of medical and vector control personnel in the diagnosis, treatment, prevention and control of leishmaniasis; and

* Document EM/RC40/7.

1.6 to promote and support research on the epidemiology and control of leishmaniasis.

2. **REQUESTS** the Regional Director:

2.1 to continue to support Member States in the planning and implementation of national programmes for the control of leishmaniasis;

2.2 to facilitate and support intercountry cooperation on the control of leishmaniasis.

Fortieth Session

Original: Arabic

Agenda item 10(a)

LEISHMANIASIS

Introductory Paragraph

Over the last few decades, it has become clear that leishmaniasis is a growing public health problem in several Member States of the Region. The Regional Committee had earlier (in 1960 and 1979) discussed the problem of leishmaniasis. Since then, knowledge about the disease has increased considerably, although, at the same time, there has been an increase in its incidence and public health importance in the Region.

The technical paper on the subject (EM/RC40/7) describes the situation regarding the different forms of leishmaniasis in the Region and proposes approaches for their control.