

# Leishmaniasis: Epidemiology, Transmission and their Clinical Manifestations

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## DESCRIPTION

Leishmaniasis is a tropical disease caused by protozoan parasites of the genus *Leishmania*. It is transmitted to humans through the bites of infected female phlebotomine sandflies. Leishmaniasis is prevalent in parts of the tropics, subtropics, and southern Europe, affecting millions of people worldwide. The disease manifests in three main forms: Cutaneous, mucocutaneous, and visceral leishmaniasis, each with distinct clinical features.

## Epidemiology and transmission

Leishmaniasis is endemic in over 90 countries, primarily in regions with tropical and subtropical climates. The World Health Organization (WHO) estimates that 700,000 to 1 million new cases occur annually. The distribution of leishmaniasis is influenced by environmental factors that affect sandfly populations, such as temperature, humidity, and vegetation.

## Transmission cycle

**Reservoir hosts:** The primary reservoirs for *Leishmania* parasites include various animal species, such as rodents, canines (especially domestic dogs), and other wild mammals. In some regions, humans also act as significant reservoirs.

**Sandfly vectors:** Female phlebotomine sandflies become infected by feeding on an infected host. The parasites develop within the sandfly's gut and migrate to the proboscis, from where they can be transmitted to a new host during subsequent blood meals.

**Human infection:** When an infected sandfly bites a human, it injects *Leishmania* parasites into the skin. The parasites are then taken up by macrophages, where they multiply and spread.

## Clinical manifestations

**Cutaneous leishmaniasis:** Cutaneous Leishmaniasis (CL) is the most common form, characterized by skin lesions that can vary

in number and appearance. The lesions typically appear weeks to months after the sandfly bite and can range from small papules to large ulcers.

**Mucocutaneous leishmaniasis:** Mucocutaneous Leishmaniasis (MCL) occurs when the parasites spread from the skin to mucous membranes, primarily affecting the nose, mouth, and throat. Initial symptoms include nasal congestion and ulcers in the nasal and oral mucosa.

**Visceral leishmaniasis:** Visceral Leishmaniasis (VL), also known as kala-azar, is the most severe form, affecting internal organs such as the spleen, liver, and bone marrow. VL can be fatal if not treated. If untreated, VL can lead to severe infections, hemorrhage, and death.

## Diagnosis

Diagnosis by examination of tissue smears or biopsies for *Leishmania* amastigotes. Culturing parasites from clinical samples in specialized media. PCR assays to detect *Leishmania* DNA in clinical specimens. Detecting antibodies against *Leishmania* in blood samples, particularly useful for VL.

## Treatment

Treatment varies depending on the form of leishmaniasis, the species of *Leishmania*, and the geographical region.

**Cutaneous leishmaniasis:** Topical treatments, cryotherapy, or intralesional injections with antimonials (e.g., sodium stibogluconate) for small, uncomplicated lesions. Oral miltefosine, intramuscular or intravenous pentavalent antimonials, and amphotericin B for more extensive or complicated cases.

**Mucocutaneous leishmaniasis:** Pentavalent antimonials, amphotericin B (liposomal or deoxycholate), and miltefosine. Treatment is often prolonged and requires close monitoring for adverse effects.

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**Visceral leishmaniasis:** Liposomal amphotericin B is preferred due to its efficacy and lower toxicity. Pentavalent antimonials, miltefosine, and paromomycin, used alone or in combination therapy depending on regional drug resistance patterns and availability.

### Prevention and control

Using insect repellent, wearing protective clothing, and sleeping under insecticide-treated bed nets. Spraying insecticides, environmental management to reduce sandfly breeding sites, and using insecticide-impregnated materials in homes.

Managing domestic animals that serve as reservoirs, such as dogs, through treatment, vaccination, or culling.

### CONCLUSION

Leishmaniasis is a complex infectious disease with significant public health implications, particularly in tropical and subtropical regions. Early diagnosis and appropriate treatment are crucial to managing the disease and preventing complications. Efforts to reduce sandfly exposure and control animal reservoirs are essential for preventing the spread of leishmaniasis.