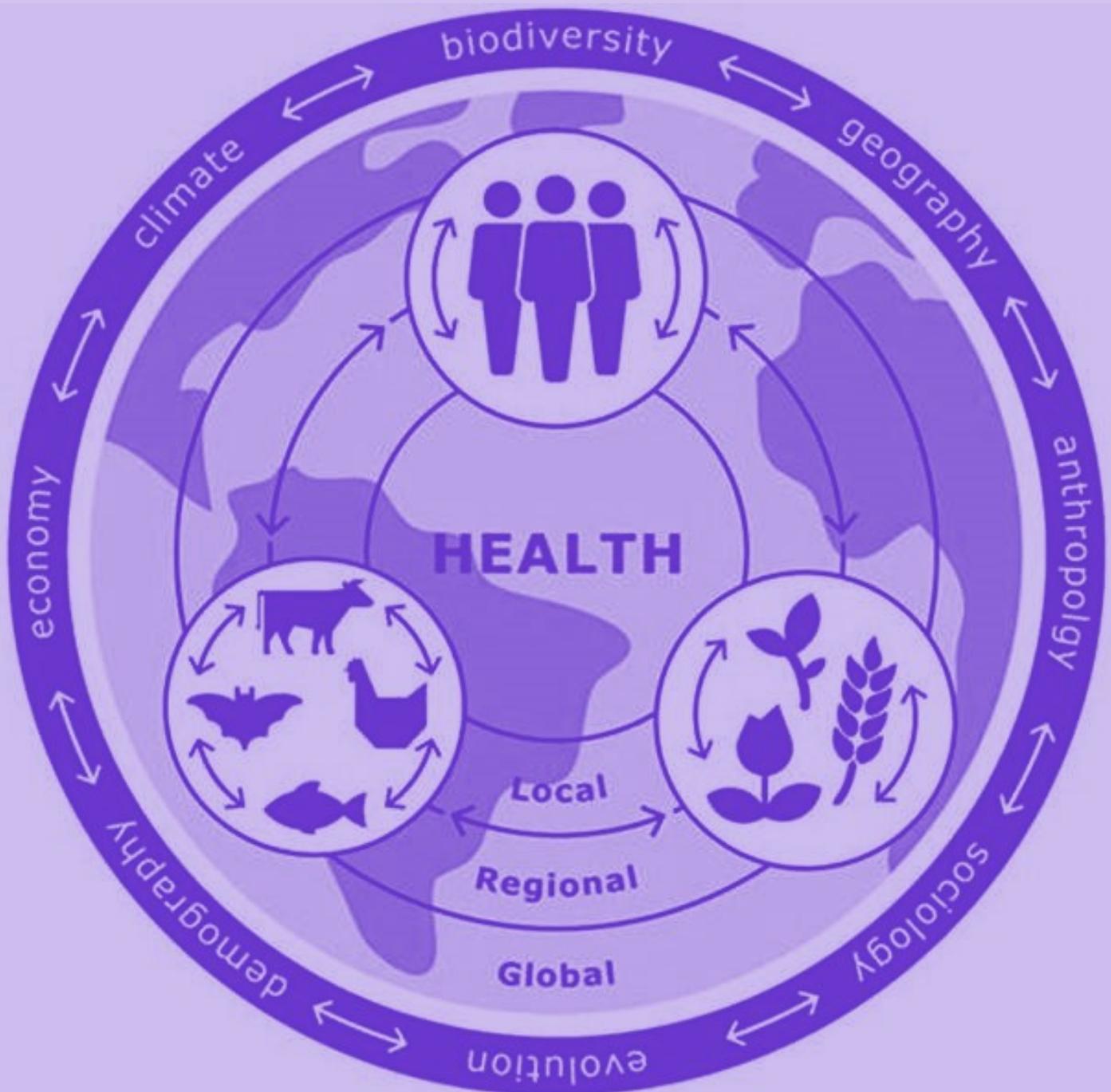




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## Leptospirosis: A Zoonotic Concern and Its Prevention

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Leptospirosis has emerged globally as important zoonotic disease, caused by pathogenic bacterium of the genus *Leptospira*. It is a widespread amongst of humans and animals, and locally it assumes considerable importance as a public health and economic problem. The change in the distribution and incidence rate of leptospirosis has occurred proportionately to the alterations in the eco-system. Reclamation of wastelands, aforestation, irrigation, changes in crops and agricultural technology have been important factors responsible for the emergence of this disease. Leptospirosis is endemic in many countries, across the world. It often has a seasonal distribution, increasing with increased rainfall or higher temperature. However, the disease can occur throughout the year. Epidemics may be associated with changes in human behaviour, animal or sewage contamination of water, changes in animal reservoir density, or follow natural disasters such as cyclones and floods.

Leptospirosis occurs worldwide

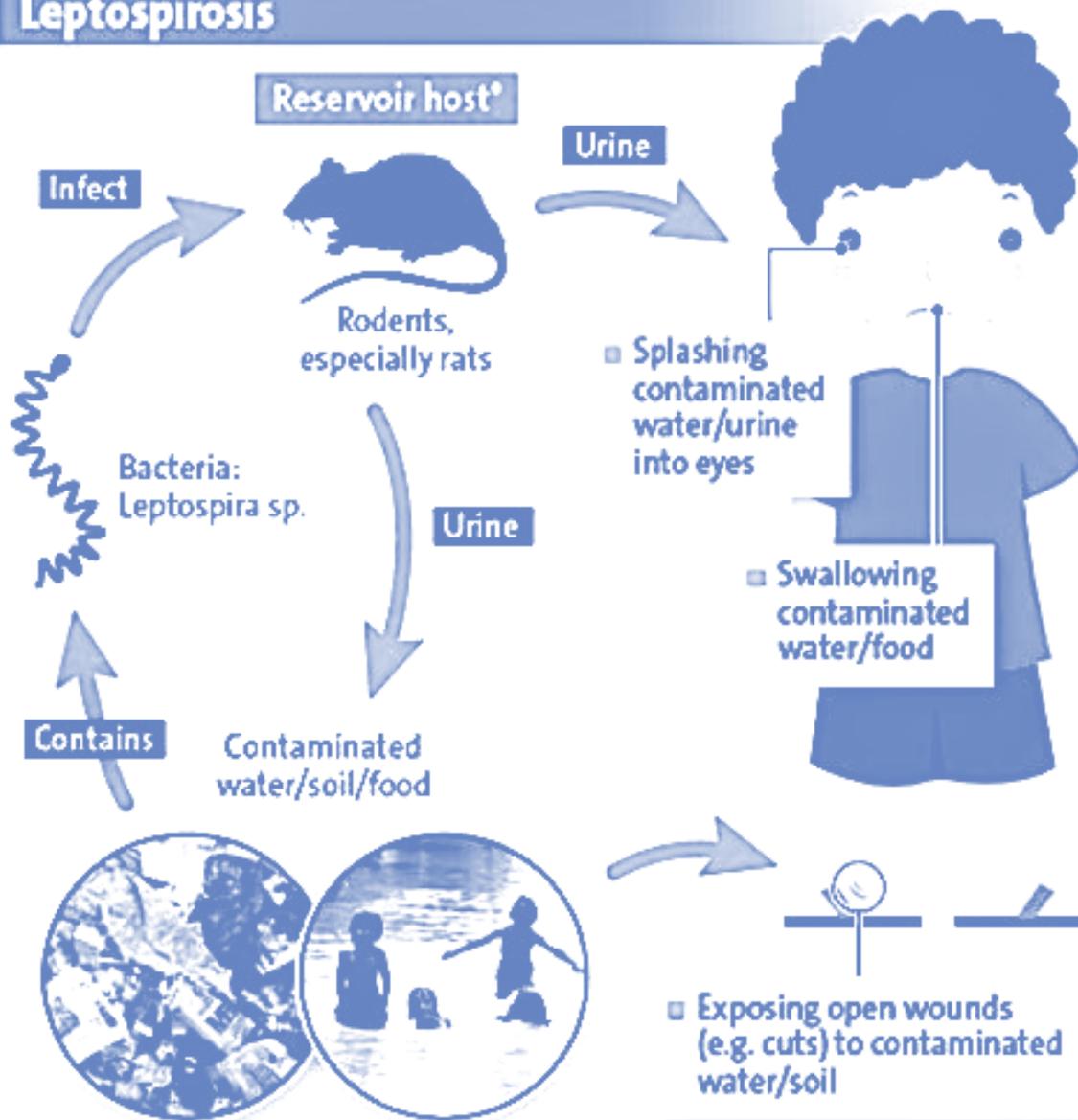
but is most common in tropical and subtropical areas with high rainfall. Leptospirosis is reported in a number of countries of the South-East Asia Region from time to time. The magnitude of the leptospirosis problem differs from country to country. Most human cases have been reported from India, Indonesia, Thailand and Sri Lanka during the rainy season. Major outbreaks in South-East Asia were reported in the past in Jakarta (2003), Mumbai (2005) and Sri Lanka (2008) (Levett, 2001). In India outbreaks of leptospirosis have been reported from coastal districts of Gujarat, Maharashtra, Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Andaman & Nicobar, Dadar and Nagar Havelli, Daman and Diu and Puducherry from time to time. In addition, the cases have also been reported from Goa and Odisha.

### Sources of infection

Pathogenic leptospires are maintained in nature in the renal tubules and genital tracts of certain animals. Virtually all mammalian species can harbour leptospires in their kidneys

# How you can get infected

## Leptospirosis



\*Reservoir hosts are animals that harbors or nourishes a pathogen (a harmful organism) and serves as a source of infection.

and act as source of infection to human beings and other animals. But the animals that commonly develop or spread leptospirosis are cattle, buffaloes, horses, sheep, goat, pigs, dogs and rodents (Bharti *et al.*, 2003). Rodents are considered as major animal species that can shed leptospir

throughout their lifespan without clinical manifestations. They are incriminated as a primary source of infection to human beings. Pigs and cattle can excrete very large amounts of leptospir in the carrier state and can be an important source of human infection. Human leptospiral infections re-

sult primarily from direct or indirect exposure to the urine of infected animals. The disease is found mainly wherever humans come into contact with the urine of infected animals or a urine polluted environment. Moisture is an important factor of the survival of the leptospire in the environment. Other modes of transmission of infection, such as handling infected animal tissues and ingestion of contaminated food and water, are also possible.

### **Clinical manifestations**

#### **Animals**

Variable clinical manifestation can be recorded depending upon animal species affected and the serovar of *Leptospire* involved. In acute leptospirosis there is sudden onset of agalactia, icterus and haemoglobinuria, especially in young animals, meningitis and acute renal failure. Chronic leptospirosis should be considered in the cases showing abortion, stillbirth, birth of weak offspring, infertility, chronic renal failure and cases of periodic ophthalmia in horses. Chronically infected animals may remain carriers for years or life and serve as reservoirs of the infection for other animals and humans.

#### **Humans**

Leptospirosis may present with a wide variety of clinical manifestations. They may range from a mild flu like illness to a serious fatal disease. The disease may also mimic many other diseases, e.g. dengue fever, typhoid, viral hepatitis and other viral haemorrhagic diseases. The most common

symptoms in leptospirosis are fever, headache, chills, muscle aches, vomiting, jaundice, red eyes, stomach pain, diarrhea, and rarely, a rash. However, some people do not have symptoms. In the more severe cases the disease can cause kidney or liver failure, meningitis, or bleeding in the lungs (Sharma *et al.*, 2006).

#### **High risk groups**

Humans in a population that are more likely to be exposed as a result of either occupational or recreational activities. The risk of infection depends on exposure. The main occupational groups at risk include farm and agricultural workers, pet shop workers, veterinarians, sewer workers, abattoir workers, meat handlers, and the military personals. Other groups at high risk of contracting leptospirosis include survivors of natural disasters (e.g. flooding). New risk groups may be formed as a result of changes in agricultural or social practices, or in reservoir animal populations in an area. In endemic areas, practically the whole population is at risk as a result of high exposure to contaminated water in daily activities, e.g. paddy and sugarcane plantation (WHO, 2003).

#### **Prevention and Control**

Because of the large number reservoirs and infection sources and the wide differences in transmission conditions, the control of leptospirosis is complicated (Faine *et al.*, 1999). Therefore, prevention and control of leptospirosis should be targeted at the infection source, the route of transmis-

sion between the infection source and human and by targeting the disease in the human host.

### 1. Control of infection source

It is important to establish which animal species are the infection sources in a particular area. Reduce certain animal reservoir populations, e.g. rats. Separate the animal reservoirs from human habitations by means of fences and screens, immunize the dogs and livestock, remove the rubbish and keeping areas around human habitat clean, and encourage people not to leave food around, especially in recreational areas where rats may be present.

### 2. Interruption of transmission

To interrupt the transmission of disease it is important to be aware of the risk factors for human infection and the infection source. Risk of infection can be minimized by avoiding contact with animal urine, infected animals or an infected environment. Where appropriate, protective clothing should be worn and wounds covered with waterproof dressings to reduce the chance of infection if exposure is likely, e.g. occupational or recreational exposure.

### 3. Human protection

Much depends on detailed knowledge of how, where and when humans may become infected in a particular area. One possibility is to increase awareness of the disease among the population, risk groups and health care providers, so that the disease can be recognized and treated as soon as

possible. Doxycycline has been reported to give some protection against infection and disease.

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