



# Leptospirosis and Dengue Outbreaks

## Why in News?

Leptospirosis is a potentially **fatal bacterial disease** that has become more **prevalent during the monsoon months**, posing a significant occupational hazard for those working in agricultural settings or in sanitary services that bring them into contact with contaminated water.

- Furthermore, public health experts are sounding the alarm about a **potential severe dengue outbreak** and emphasizing the need for enhanced clinical and virological surveillance. Changes in **circulating dengue virus (DENV) serotypes** could lead to more severe and life-threatening conditions.
  - Thiruvananthapuram district, Kerala reported that 70% of dengue case samples in 2022 were DENV3, with some cases of DENV4.

## What is Leptospirosis?

- **About:**
  - Leptospirosis is caused by the **bacterium Leptospira interrogans**, which is primarily found in the **urine of infected animals**.
  - **Wild and domestic animals**, including rodents, cattle, pigs, and dogs, serve as carriers of the disease.
- **Symptoms:**
  - Leptospirosis can manifest with a range of symptoms, from **a mild flu-like illness to life-threatening conditions**.
    - Common symptoms include **sudden fever, chills, and headache**, or sometimes **no symptoms at all**.
    - Severe cases can lead to **organ dysfunction, affecting the liver, kidneys, lungs, and the brain**.
- **Transmission:**
  - The transmission cycle begins with infected animals **shedding leptospira in their urine**.
    - Individuals who **come into direct contact with infected animal urine or indirectly through contaminated soil and water** are at risk.
      - People with **cuts or abrasions on their skin** have a higher likelihood of contracting leptospirosis.
- **Prevention:**
  - **Preventing animal infection, Hygienic animal-keeping conditions**, proper waste management, and improved sanitation facilities are essential to reduce the spread of leptospirosis and minimize economic losses for farmers.
  - Adopting a '**One Health**' approach, which considers the **interconnectedness of human, animal, plant, and environmental health**, is crucial in leptospirosis control.
- **Misconceptions About Leptospirosis:**
  - One common misconception is associating **leptospirosis solely with rats**, which is not accurate as it can be transmitted by multiple animal reservoir hosts.

## What is Dengue?

- **About:**

- Dengue is a **mosquito-borne tropical disease** caused by the dengue virus (**Genus Flavivirus**), transmitted by several species of mosquito within the genus **Aedes**, principally **Aedes aegypti**.
  - This mosquito also transmits [chikungunya](#) and [Zika infection](#).
- **Serotypes of Dengue:**
  - There are 4 distinct, but closely related, serotypes (separate groups within a species of microorganisms that all share a similar characteristic) of the virus that cause dengue (**DEN-1, DEN-2, DEN-3 and DEN-4**).
- **Symptoms:**
  - Sudden high fever, severe headaches, pain behind the eyes, severe bone, joint, and muscle pain, etc.
- **Dengue Vaccine:**
  - Researchers at [India's National Centre for Biological Sciences](#), in collaboration with nine other institutions in India, Africa, and the US, have developed **India's first and only DNA vaccine candidate for dengue fever**.
  - The **dengue vaccine CYD-TDV or Dengvaxia** was approved by the US Food & Drug Administration in 2019, the **first dengue vaccine to get the regulatory nod in the US**.
    - **Dengvaxia** is basically a **live, attenuated dengue virus** that has to be administered in people of ages **9 to 16** who have laboratory-confirmed previous dengue infection and who live in endemic areas.
- **Challenges in Vaccine Development:**
  - Developing an effective dengue vaccine is challenging due to the **four closely related virus serotypes**, each **interacting differently with antibodies**. An ideal vaccine should **target all serotypes** while **avoiding antibody-dependent enhancement (ADE)**, where antibodies can aid the virus, causing severe disease.

## UPSC Civil Services Examination Previous Year Question (PYQ)

### Prelims

**Q. Which of the following diseases can be transmitted from one person to another through tattooing? (2013)**

1. Chikungunya
2. Hepatitis B
3. HIV-AIDS

**Select the correct answer using the codes given below:**

- (a) 1 only  
(b) 2 and 3 only  
(c) 1 and 3 only  
(d) 1, 2 and 3

**Ans: (b)**

**Source: TH**