



## National Pest Surveillance System (NPSS)

[Source: TH](#)

Recently, the union government has launched the **National Pest Surveillance System (NPSS)**, an **Artificial Intelligence (AI)-based platform** aimed at **connecting farmers with agricultural scientists** and experts to enhance pest control measures.

- This initiative is part of a broader strategy to **reduce farmers' reliance on pesticide retailers** and promote a scientific approach to pest management.

### **Features of NPSS Platform:**

- **AI-Driven Analysis:** The system utilises **Artificial Intelligence (AI)** to analyse real-time data on pest infestations, allowing for timely interventions.
- **Direct Communication:** Farmers can easily **communicate with experts by uploading images of affected crops** or pests via their mobile phones, facilitating rapid diagnosis and treatment recommendations.
- **Reduction of Pesticide Dependence:** By providing **accurate pest management advice**, NPSS aims to decrease the overuse of pesticides, thereby promoting sustainable agricultural practices.
- **Widespread Reach:** The platform is **expected to assist approximately 140 million farmers across India**, enhancing accessibility to expert advice.
  - The app will help farmers avoid unnecessary pesticide purchases by providing accurate advice on pest management.
- **Integration with Local Outreach:** The technology will be disseminated through state-level outreach programs, ensuring that farmers receive support tailored to their regional agricultural challenges.

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# 7 USE CASES



## PEST CONTROL

Image-recognition technology identifies and treats various types of bugs and vermin.

AI algorithms determine which breeds and conditions will produce the highest yields

## BOOST CROP YIELD



## SEASONAL FORECASTING

AI systems create probabilistic models for seasonal forecasting.

AI enhances IoT devices transforming farm management systems.

## ENHANCE IOT DEVICE DATA



## BETTER CROP SELECTION

AI helps determine crop choices for farm's needs.

Chatbots answer farmer's questions, provide advice and recommendations on specific farm problems

## CHATBOTS FOR FARMERS



## AGRICULTURAL ROBOTS

Agricultural robots harvest crops faster than human laborers.

Read More: [Adoption of Modern Technology in Agriculture](#)

## WHO Declares Mpox a PHEIC

Source: [IE](#)

The [World Health Organization \(WHO\)](#) has declared [mpox](#) (monkeypox), a [Public Health](#)

**Emergency of International Concern (PHEIC)** due to a significant upsurge in cases, particularly in the **Democratic Republic of Congo (DRC)** and neighbouring African countries.

- The disease has been detected in 10 African nations this year, with over 96% of cases located in the DRC. The emergence of a **new virus strain, clade 1b, spreading mainly through sexual contact, is particularly concerning.**
  - The risk assessment of another clade (1a), which is spreading **mostly in children** through multiple modes of transmission, has also been considered to be high.
- The PHEIC designation is the **highest level of alarm under International Health Regulations (IHR, 2005),** reflecting the disease's **potential to spread beyond Africa.**
  - This is the **second time in two years that mpox** has been declared a global emergency.
- Mpox is a viral illness caused by the monkeypox virus, a species of the genus **Orthopoxvirus.** Two different **clades exist: clade I and clade II.**
- **Symptoms:** Skin rash or mucosal lesions which can last 2–4 weeks accompanied by fever, headache, muscle aches, back pain, low energy, and swollen lymph nodes.
- **Transmission:** It can be **transmitted to humans through physical contact** with someone who is infectious, with contaminated materials, or with infected animals.
- **Prevention:** Mpox can be prevented by avoiding physical contact with someone who has mpox. Vaccination, including the **JYNNEOS® vaccine,** can help protect those at risk.
- **Treatment:** Persons with mpox should be isolated. **Several antivirals, such as tecovirimat,** have been used to treat mpox, and further studies are underway

Read more: [Mpox Virus](#)

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## Emerging Covid Strains Spark Renewed Concerns

Source: [TH](#)

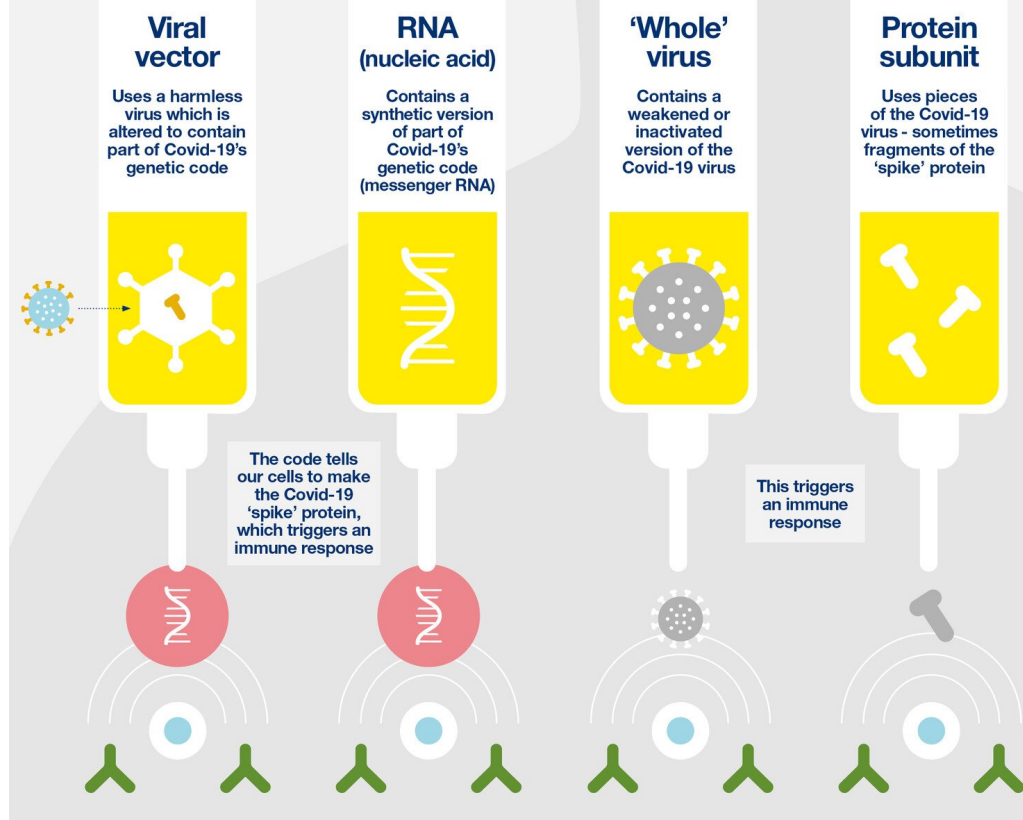
Recently, the central government has attributed the recent surge in **Covid-19** cases in India to two strains, **KP.1** and **KP.2.**

- These strains are categorised under the **“FLiRT” group and have** evolved from the **JN1 Omicron** variant.
- These are **highly transmissible,** causing **mild symptoms** such as fever, cold, cough, sore throat, body ache, and fatigue.
- KP.2 was classified by the **World Health Organization (WHO)** as a **Variant Under Monitoring.**
- **Covid-19** is an infectious disease caused by the **SARS-CoV-2 virus.**
  - **COVISHIELD, Covaxin** and **AstraZeneca** were among the recommended vaccines for Covid-19 in India.

### **Government Measures to Monitor the Spread of New Strains:**

- The **Integrated Disease Surveillance Program (IDSP)** under the **National Centre for Disease Control (NCDC)** has been implemented in all 36 States/UTs and sanctioning Viral Research and Diagnostic Laboratories across India to improve virus detection and research.
- **Pradhan Mantri-Ayushman Bharat Health Infrastructure Mission (PM-A BHIM)**

## How do different Covid-19 vaccines work?



Read More: [WHO Designates JN.1 as Variant of Interest as Covid-19 Cases Rise](#)

## Kosi-Mechi River Linking Project

**For Prelims:** Kosi-Mechi River Linking Project, [National Perspective Plan for Interlinking Rivers](#), [Kosi River](#), [Mahananda River](#), Mechi River.

**For Mains:** Interlinking of Rivers in India and associated issues, Issues Relating to Development, Water Management

**Source:** [DTE](#)

### Why in News?

The **Kosi-Mechi River Linking Project**, part of India's ambitious [National Perspective Plan \(NPP\) for interlinking rivers](#), has become a point of contention. [Flood](#) victims in Bihar have protested against its implementation.

- The project is aimed at improving irrigation in the region. However, locals argue that it **fails to address the critical issue of flood control**, which affects them annually.

## What are the Key Facts About the Kosi-Mechi River Linking Project?

- **About:** The project involves linking the [Kosi River](#) with the [Mechi River](#), a tributary of the [Mahananda River](#), impacting regions in Bihar and Nepal.
  - Aims to provide annual irrigation to 4.74 lakh hectares (2.99 lakh hectares in Bihar) and 24 million cubic meters (MCM) of domestic and industrial water supply.
    - Upon completion, the project is expected to release an additional 5,247 cubic feet per second (cusecs) of water from the Kosi barrage.
  - The project is overseen by the **National Water Development Agency (NWDA)**, under the **Union Ministry of Jal Shakti (Water Resources)**.
- **Concerns:** The project is designed primarily for irrigation purposes, with an aim to support 215,000 hectares of agricultural land in the Mahananda river basin during the [Kharif season](#).
  - Despite government claims, the project does not have a significant flood control component, which is a major concern for the flood-prone region.
  - The project will release only 5,247 cubic feet per second (cusecs) of additional water from the barrage, which is negligible compared to the barrage's capacity of 900,000 cusecs.
    - Locals argue that such a **small reduction in water flow will not be effective in preventing the annual flooding** that devastates the region.
  - Flooding and [land erosion](#) have destroyed homes and inundated crops, affecting local livelihoods and villagers living between embankments.
    - The project's focus on irrigation does not address these immediate and recurring challenges.

## What are the Key Facts About Kosi River and Mechi River?

- **Kosi River:** It is known as the "**Sorrow of Bihar**," originates over 7,000 metres above sea level in the Himalayas, within the catchment area of [Mount Everest](#) and [Kanchenjunga](#).
  - Flowing through China, Nepal, and India, it enters India near Hanuman Nagar and merges with the [Ganga River](#) near Kursela in Katihar district Bihar.
  - The Kosi River is formed by the confluence of three main streams: the **Sun Kosi, Arun Kosi, and Tamur Kosi**.
    - The Kosi river is known for its **tendency to shift its course westward**, having moved 112 km over the last 200 years, devastating agricultural lands in Darbhanga, Saharsa and Purnea districts.
  - **Tributaries:** The river has several important tributaries, including the **Trijunga, Bhutahi Balan, Kamla Balan, and Bagmati**, all of which join the Kosi River during its course through the plains.





- **Mechi River:** It is a trans-boundary river flowing through Nepal and India. It is a tributary of the Mahananda River.

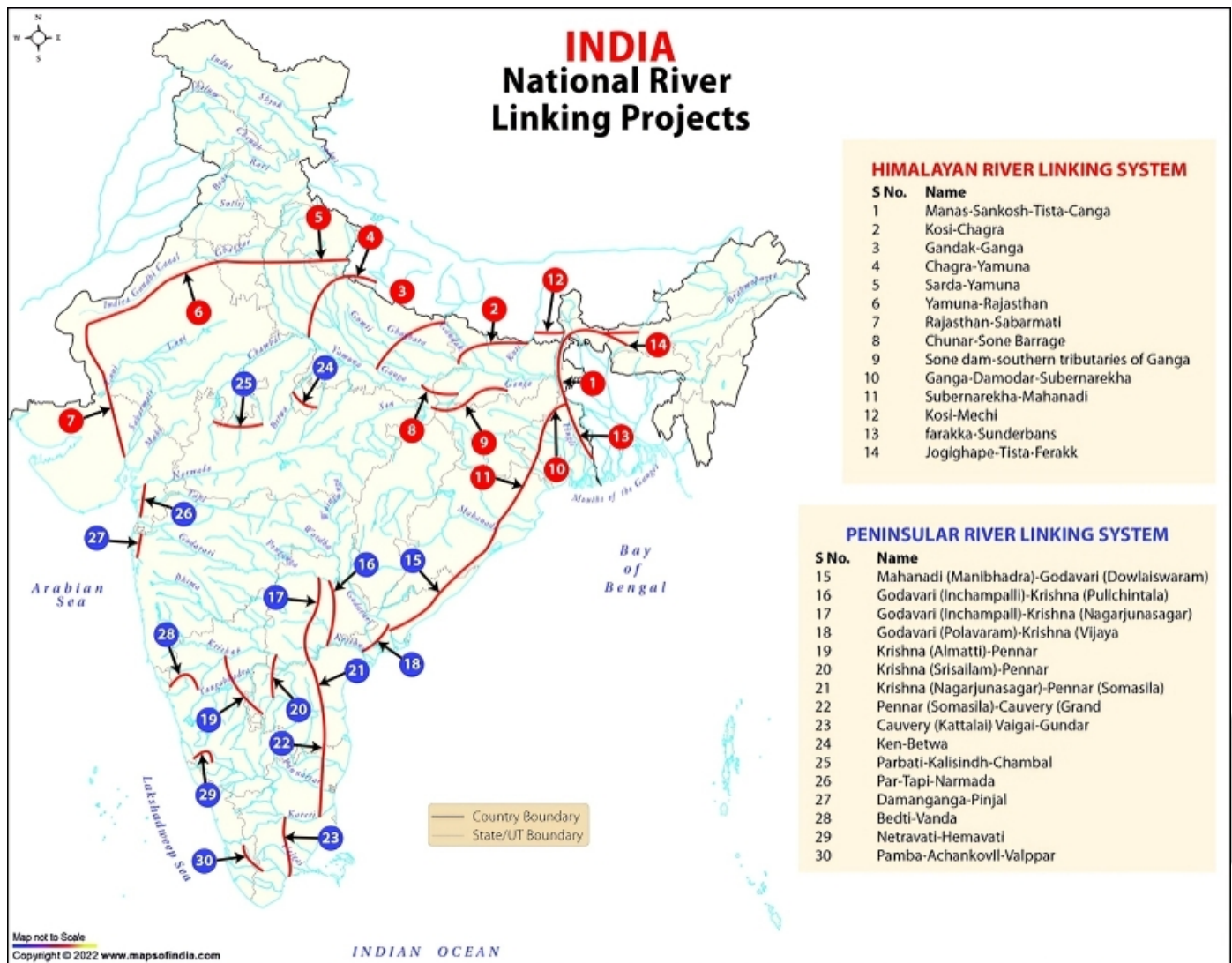
- The river Mechi is a perennial river which rises in the inner valley of the Himalaya in Mahabharat range of hills in Nepal and then flows through the Indian state of Bihar to join the Mahananda in Kishanganj district.

## Mahananda River

- It is a part of the Eastern Himalayan river system. The Mahananda River consists of **two streams**, one rises in the **Himalayas in Nepal, flows through Bihar**, and meets the Ganga from the north. Locally named **Fulahar**.
  - The other rises in Darjeeling, West Bengal, enters Bangladesh, and merges with the **Ganga near Godagarighat, Bangladesh**. Known as Mahananda.
- **Catchment Area:** Stretches over the sub-Himalayan region of Nepal and West Bengal, one of the highest rainfall regions in India.
- **Flooding:** The streams often combine during peak monsoon months, leading to **significant inundation in Bihar and West Bengal**. Flooding is exacerbated when the Ganga is at its peak, causing extensive waterlogging in affected districts like Purnea and Katihar in Bihar, and Darjeeling, West Dinajpur, and Malda in West Bengal.

## What is the National Perspective Plan for Interlinking Rivers?

- **About:** NPP was formulated in 1980 by the Ministry of Irrigation (now Ministry of Jal Shakti), to **develop water resources through the inter-basin transfer of water.**
- **Components:** The plan is divided into two main components: the **Himalayan Rivers Development Component and the Peninsular Rivers Development Component.**
- **Projects Identified:** 30 link projects have been identified, with 16 under the Peninsular Component and 14 under the Himalayan Component.
  - **Key Projects Under Peninsular Component:** Mahanadi-Godavari Links, Godavari-Krishna Links, Par-Tapi-Narmada Link, and [Ken-Betwa Link](#) (first project under the NPP to begin implementation).
  - **Key Projects Under Himalayan Component:** Kosi-Ghaghra Link, Ganga (Farakka)-Damodar-Subernarekha Link, and Kosi-Mechi Link.
- **Significance:** The NPP aims to **manage flood risks in the Ganga-Brahmaputra-Meghna basin.**
  - It seeks to address **water shortages in western and peninsular states** such as Rajasthan, Gujarat, Andhra Pradesh, Karnataka, and Tamil Nadu.
  - The plan aims to **improve irrigation in water-scarce regions**, boosting agricultural productivity and thereby enhancing food security and potentially doubling farmers' incomes.
    - It will facilitate the development of **infrastructure for freight movement** via environmentally friendly [inland waterways.](#)
  - The NPP is designed to **utilise surface water to alleviate [groundwater depletion](#)** and reduce the amount of freshwater flowing into the sea.
- **Challenges: Comprehensive feasibility studies assessing the economic, social, and ecological impacts are often incomplete or lacking.**
  - Inadequate data can lead to uncertainties about the project's effectiveness and potential unintended consequences.
  - Water being a state subject complicates agreements on [water sharing between states](#), **leading to potential disputes.** For example, issues have arisen between Kerala and Tamil Nadu.
  - Large-scale water transfers can **worsen flooding**, disrupting local ecosystems and communities. Additionally, changes in **water flow may lead to water logging and increased salinity** in agricultural lands, negatively affecting soil quality and crop yields.
  - The extensive financial outlay for construction, maintenance, and operation of dams, canals, and related infrastructure presents a significant economic burden.
  - [Climate change](#) can alter rainfall patterns, which may affect the availability and distribution of water, potentially undermining the intended benefits of the interlinking projects.



## Way Forward

- Develop a comprehensive plan for **floodplain zoning**, restricting settlements and critical infrastructure in high-risk areas. Encourage **flood-resistant housing** and cropping patterns in designated zones.
  - Invest in fortifying embankments along the Kosi River to prevent breaches and reduce inundation
- Develop a clear mechanism to **ensure equitable distribution of project benefits**. Flood-prone areas should see significant investments in flood control measures, while water-scarce regions benefit from improved irrigation infrastructure.
- Given the challenges faced by the Interlinking of Rivers plan, adopting the **National Waterways Project (NWP) offers a promising alternative**.
  - The NWP, which uses excess floodwaters that currently flow into the sea, avoids state disputes over water sharing and provides a more cost-effective solution for irrigation and power generation.

### **Drishti Mains Question:**

**Q.** Discuss the objectives and expected benefits of the Kosi-Mechi River Linking Project. How does it align with the broader goals of the National Perspective Plan for Interlinking Rivers?

**UPSC Civil Services Examination, Previous Year Question (PYQ)**



**Q.** The interlinking of rivers can provide viable solutions to the multi-dimensional inter-related problems of droughts, floods, and interrupted navigation. Critically examine. **(2020)**

## Wolbachia-Infected Mosquitoes for Dengue Control

**Source:** TH

### Why in News?

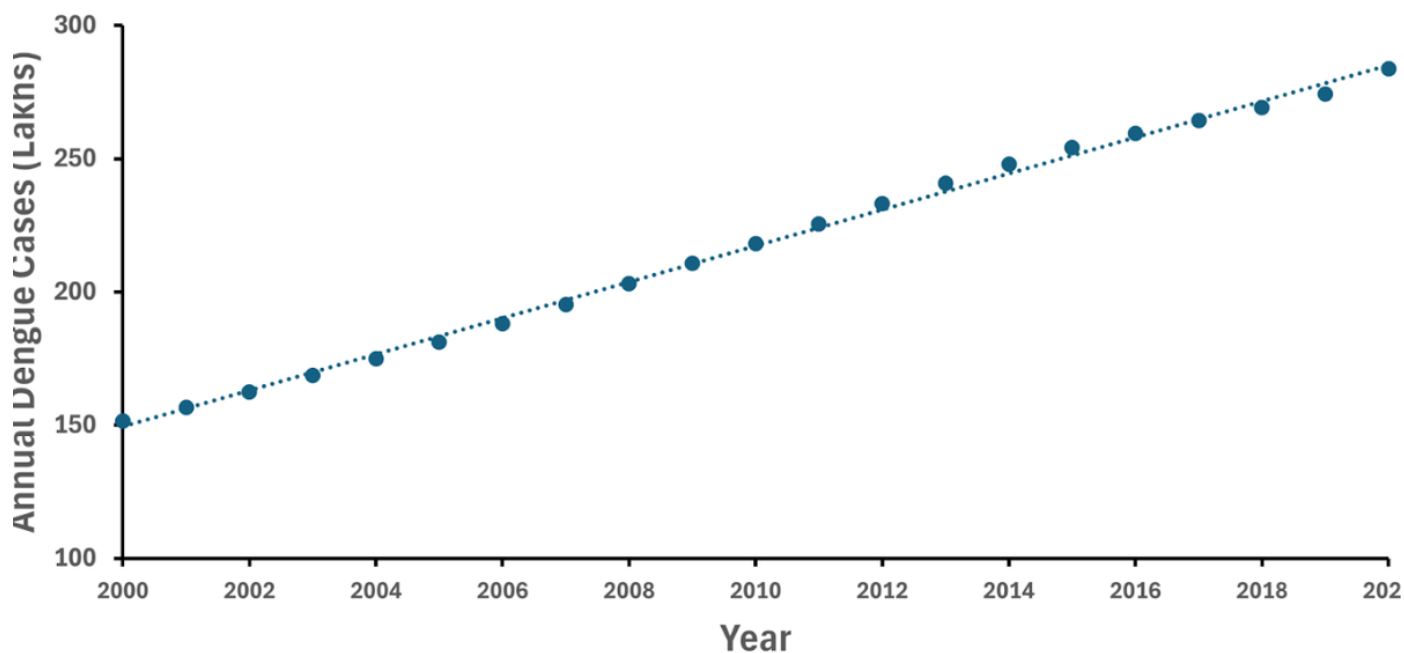
**Dengue fever, chikungunya, and Zika virus** represent major public health challenges in India, leading to considerable economic losses and healthcare burdens.

- The **limited success of traditional control methods** underscores the need for innovative strategies, such as the use of **Wolbachia-infected mosquitoes**, which offer a promising alternative.

### Note:

- As of April 2024, **India recorded 19,447 dengue cases and 16 deaths**. Kerala had the highest number of cases, followed by Tamil Nadu.
  - In India, the **economic impact of dengue** is estimated at **Rs 28,300 crore** annually, alongside 5.68 lakh years of young life lost.
- Globally, the **World Health Organization (WHO)** has reported over **7.6 million cases** of dengue as of April 2024.

Annual Estimated Dengue Cases in India (Year 2000-2020, Lakhs)



## How does Wolbachia Help in Controlling Mosquito Populations?

### ▪ About:

- Wolbachia is a common type of bacteria found in insects. Approximately 6 in 10 of all insects, including butterflies, bees, and beetles, around the world have Wolbachia.

- Wolbachia bacteria cannot make people or animals (for example, fish, birds, pets) sick.

- They are **not found in Aedes Aegypti mosquitoes.**

- **Aedes aegypti can spread viruses including dengue, Zika, and chikungunya.**
- Aedes mosquitoes with **Wolbachia can be used to reduce the number of target mosquito species.**

- Mosquitoes with Wolbachia are **not [genetically modified](#).**

### ▪ **Process of Production:** Wolbachia bacteria are first **introduced into the eggs of male and female Aedes Aegypti mosquitoes.**

- The eggs are then used to **mass-produce new mosquitoes infected with Wolbachia.**
  - There are **2 Wolbachia strains, wMel and wAlbB**, that have been transfected into **Aedes Aegypti** mosquitoes for population replacement.
- After production, the mosquitoes are **sorted by sex, with only the males being retained for release**, while the females are kept for further breeding in the laboratory.




### ▪ **Use for Mosquito Control:** **Wolbachia-infected mosquitoes** are used to **lower the population of target species** like **Aedes Aegypti**, the yellow fever mosquito, that can spread **dengue fever, chikungunya, Zika fever, Mayaro** etc.

- Control professionals release male **Aedes Aegypti** mosquitoes carrying **Wolbachia** into areas with wild **Aedes Aegypti**.
- When these **males mate with wild females that lack Wolbachia**, the **eggs produced do not hatch**. As a result, the population of **Aedes Aegypti** mosquitoes decreased.

### ▪ **Status of Wolbachia Programs in India:** **India currently lacks an active Wolbachia mosquito release program.**

- The **[Indian Council of Medical Research](#) - Vector Control Research Center (ICMR-VCRC)** has initiated the development of **wMel Aedes strains** but has faced delays in public updates and government approvals.
- Recent findings indicate the natural presence of Wolbachia in Aedes mosquitoes in Northeast India, **though its immediate significance is unknown.**

# Most common mosquito-borne diseases

Mosquito	Type of Mosquito	Disease caused
	<b>Aedes</b>	<b>Chikungunya</b> <b>Dengue</b> <b>Lymphatic filariasis</b> <b>Rift Valley fever</b> <b>Yellow Fever</b> <b>Zika</b>
	<b>Anopheles</b>	<b>Lymphatic filariasis</b> <b>Malaria</b>
	<b>Culex</b>	<b>Japanese encephalitis</b> <b>Lymphatic filariasis</b> <b>West Nile fever</b>

## Global Examples for Wolbachia Implementation

- In **Singapore**, the release of infected male mosquitoes **resulted in a 90% reduction in the Aedes population** and a 77% decrease in dengue cases in release areas.
- **Australia** adopted a population replacement strategy, leading to a stable **wMel strain** genome in wild populations and significant reductions in dengue incidence.
- A landmark randomised controlled trial in **Indonesia** demonstrated that areas with released wMel (strain) mosquitoes experienced **a 77% reduction in dengue cases and an 86% decrease in hospitalizations.**

## UPSC Civil Services Examination, Previous Year Question

**Q. Consider the following statements: (2017)**

1. In tropical regions, Zika virus disease is transmitted by the same mosquito that transmits dengue.
2. Sexual transmission of Zika virus disease is possible.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (c)

**Q. 'Wolbachia method' is sometimes talked about with reference to which one of the following? (2023)**

- (a) Controlling the viral diseases spread by mosquitoes
- (b) Converting crop residues into packing material
- (c) Producing biodegradable plastics
- (d) Producing biochar from thermo-chemical conversion of biomass

Ans: (a)

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## Former PM Shri Atal Bihari Vajpayee's Punya Tithi

[Source: PIB](#)

Recently, PM Narendra Modi paid tributes to former PM Atal Bihari Vajpayee on his punya tithi at 'Sadaiv Atal' memorial.

- **Atal Bihari Vajpayee: born on 25th December, 1924 in the erstwhile princely state of Gwalior (now a part of Madhya Pradesh).**
  - He entered in national politics during the [Quit India Movement of 1942](#) which hastened the end of British colonial rule.
- In 1947, Vajpayee started working as a journalist for newspapers of **Deendayal Upadhyaya – Rashtradharma (a Hindi monthly), Panchjanya (a Hindi weekly)** and the dailies **Swadesh and Veer Arjun.**
  - Later, influenced by [Syama Prasad Mookerjee](#), Vajpayee joined the Bharatiya Jana Sangh in 1951.
- He was the **former Prime Minister of India** and was elected to the position twice in 1996 and 1999.
- As a parliamentarian, Vajpayee was awarded with the [Pandit Govind Ballabh Pant](#) Award for Best Parliamentarian in 1994, which defines him as "**a role model par excellence for all legislators.**"
- He was conferred with the country's highest civilian honour, the [Bharat Ratna](#) in 2015 and second-highest civilian honour, the [Padma Vibhushan](#) in 1994.
- A revered former Prime Minister, he passed away on 16<sup>th</sup> August 2018.

Read More: [Atal Bihari Vajpayee Passes Away,](#)

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## Subclinical Tuberculosis

[Source: TH](#)



## Why in News?

Subclinical [Tuberculosis \(TB\)](#) is a growing concern in India, contributing to the slow **decline in TB incidence rates** despite advances in detection and treatment.

## What is Subclinical Tuberculosis?

- **Definition:** Subclinical TB refers to a form of **TB infection where individuals do not exhibit the typical symptoms** of the disease, such as a persistent cough.
  - This makes it harder to detect compared to active TB, which presents with more apparent symptoms.
- **Detection:** It is often identified through imaging techniques like **chest X-rays or molecular tests**, as it may not be noticeable through routine symptom-based screenings.
- **Prevalence:** Subclinical TB accounted for **42.6% of cases in the National TB Prevalence Survey (2019-2021)**, with similar findings in Tamil Nadu (39%).
  - Although asymptomatic, individuals with subclinical **TB can still spread the bacteria to others.**
  - High-burden countries, including India, have a **considerable proportion of subclinical TB, which remains largely undetected**, thus sustaining the transmission of the disease.
  - Countries like Vietnam have successfully reduced TB prevalence by screening entire populations **using X-rays and molecular tests, regardless of symptoms.**
    - Implementing similar large-scale screening in India would require strategic shifts, including mobile units and community engagement.
- **Impact:** This form of TB can contribute to the slow decline in overall TB incidence rates, as it remains largely undetected and untreated.

## What are the Key Facts About Tuberculosis?

- **About:** TB is an infectious disease caused by *Mycobacterium tuberculosis*, that mainly affects the **lungs**. It spreads through the **air when infected people cough, sneeze or spit.**
- **Symptoms:** Prolonged cough, chest pain, weakness, fatigue, weight loss, fever, and night sweats.
  - Diabetes, weakened immune system, malnutrition, tobacco use can increase the risk of TB disease.
- **Prevention:** Seek medical attention, get tested if at risk, early treatment. The **Bacille Calmette-Guérin (BCG) vaccine** helps prevent TB outside the lungs but not in the lungs.
- **Prevalence and Treatment:** About 25% of the global population has been infected with TB bacteria. **5-10% of these infections progress to active TB disease.**
  - TB is preventable and curable with **antibiotics**, typically including **isoniazid, rifampin, pyrazinamide, ethambutol, and streptomycin.**
  - **Multidrug-resistant TB (MDR-TB)** is caused by bacteria resistant to first-line drugs, treatable with costly and toxic second-line drugs.
    - MDR-TB remains a public health crisis, with only about **2 in 5 people accessing treatment in 2022.**
- **TB and HIV:** People living with **HIV (human immunodeficiency virus)** are **16 times more likely to develop TB**. TB is the leading cause of death among people with HIV.
  - Without proper treatment, **60% of HIV-negative people with TB and nearly all HIV-positive people with TB will die.**
- **Impact:** TB disproportionately affects adults in low and middle-income countries, with over **80% of cases and deaths occurring in these regions**. The highest burden is in the **World Health Organization's (WHO) South-East Asian and African Regions.**
  - A total of 1.3 million people died from TB in 2022 (including 167 000 people with HIV). Worldwide, TB is the second leading infectious killer after Covid-19.
- **Initiatives Related to TB:**
  - **India:**
    - **[The National TB Elimination Programme \(NTEP\) to Eliminate TB by 2025.](#)**
    - **[Ni-kshay Mitra Initiative.](#)**
    - **[Direct Benefit Transfer \(DBT\)](#)** provided to TB patients.

- **TB-Mukt Panchayat Initiative:** Launched to leverage the support of over 2.5 lakh Gram Panchayats to increase TB awareness, eliminate stigma, and improve service uptake.
- [Pradhan Mantri TB Mukt Bharat Abhiyan \(PMTBMBA\)](#)

▪ **Global:**

- **The Global Tuberculosis Programme by the [World Health Organization](#)** works towards the goal of a world free of TB, with zero deaths, disease and suffering due to the disease.
- Global Plan to End TB 2023-2030 is a plan to end tuberculosis as a public health challenge by 2030, in line with the [UN Sustainable Development Goals](#).
  - **SDG 3 aims** to prevent needless suffering from **preventable diseases and premature death** by focusing on key targets that boost the health of a country's overall population.
- [Global Tuberculosis Report](#).



# Tuberculosis

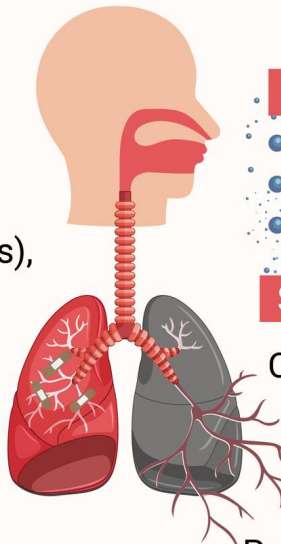


**Drishti IAS**

Tuberculosis (TB) is an infectious disease that affects the lungs.  
Tuberculosis is preventable and curable.

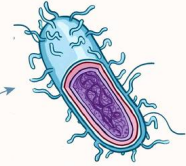
## Prevention

- Seek medical intervention if symptoms persist
- If at a higher risk (HIV patients), get tested for TB.
- Practice good cough hygiene: Wear a mask and avoid contact



## Causes:

- *Mycobacterium tuberculosis*
- Coughing droplets
- Prolonged exposure from a patient



## Symptoms of TB:

- Chest pain
- Weakness
- Weight loss
- Fever
- Night sweats
- Prolonged cough

## Facts

- 1.6 million deaths in 2021 Worldwide
- 13<sup>th</sup> leading cause of death
- India aims to achieve the UN's TB-related SDGs by 2025, five years ahead of the global target to end the TB epidemic by 2030.

#Tuberculosis

## Ni-kshay Programme

- Nikshay Mitra are individuals or groups who adopt one TB patient for their treatment for a period of 6 months
- Provision of free drugs and diagnostics
- Ni-kshay Poshan Yojana for nutritional support to TB patients

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

**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)

PDF Reference URL: <https://www.drishtias.com/current-affairs-news-analysis-editorials/news-analysis/19-08-2024/print>

