



Rethinking India's Strategy Against Aedes Mosquitoes

Source: TH

Why in News?

India faces rising [dengue](#), [chikungunya](#), and [Zika](#) cases transmitted by the [Aedes mosquitoes](#), yet authorities still depend on less effective fumigation.

- Experts call for personal protection, community action, and innovative, cost-effective measures.

Why are Current Measures Against Aedes Mosquitoes Failing?

- **Mosquito Behaviour:** Aedes mosquitoes **bite mainly indoors** during the daytime and **at night under artificial light**. Hence, outdoor fogging miss most of their activity.
 - Local authorities still conduct **large-scale fumigation**, though national health agencies do not recommend it as a routine method. It provides little long-term impact.
- **Chemical Resistance:** Mosquitoes are developing tolerance to **pyrethroid-based vaporizers** and **temephos larvicides**, reducing their effectiveness.
- **High Cost of New Technologies:** Promising innovations like [Wolbachia mosquitoes](#) or **spatial repellents** remain underused due to high costs and lack of institutional support.
- **Incomplete Vaccine Protection:** While dengue vaccine trials such as [DengiAll](#) are ongoing, there is still no approved and effective vaccine for chikungunya or Zika in India.

What Measures can Strengthen the Fight Against Aedes Mosquitoes?

- **Shift Focus from Fogging to Source Reduction:** Fogging kills few mosquitoes because *Aedes* rest indoors. The government should prioritise larval source management by cleaning stagnant water in homes, rooftops, tyres, and construction sites.
 - Example: Delhi's "10 Hafte, 10 Baje, 10 Minute" campaign encourages households to check water containers weekly.
- **Strengthen Community Participation:** *Camino Verde trial in Latin America* showed significant dengue reduction when communities managed breeding sites.
 - India can replicate such evidence-based community mobilisation at ward/village level.
 - Like Polio campaigns, India needs a "Dengue Free India Mission" combining school education, TV, and digital outreach.
 - Accredited Social Health Activists (ASHAs) can be frontline educators for household-level awareness.
- **Ensure Affordable and Safe Repellents:** Widespread use of DEET (N,N-diethyl-meta-toluamide)-based repellents (proven most effective) should be promoted.
 - The government can subsidise or include repellents under [Jan Aushadhi Kendras](#) for mass accessibility.
- **Promote Personal Protection: Encourage use of long sleeves, treated nets for daytime sleepers, and insecticide-treated school uniforms.**
 - Awareness campaigns must stress that *Aedes* bite during the daytime, unlike malaria

mosquitoes.

- **Support Innovative Interventions:** Integrate [Wolbachia-infected mosquitoes](#) (being scaled up in Brazil, Indonesia, Australia) to reduce dengue transmission.
 - Vaccine development should be supported but used cautiously due to limited efficacy.
- **Environmental and Waste Management:** *Aedes* thrive in plastic waste and discarded containers. India needs stronger solid waste management and plastic recycling initiatives.
 - Smart cities and Swachh Bharat Mission can integrate anti-dengue waste management drives.

Burden of Aedes Mosquitoes

- The burden of Aedes mosquitoes **stems from their role as vectors** for multiple severe and rapidly spreading **arboviruses, including Dengue, Zika, and Chikungunya**.
- Dengue is **both endemic and emerging in India**, which bears one of the world's highest burdens, with about **33 million symptomatic and 100 million asymptomatic infections annually**.
- India reported its **first Zika case from Gujarat State in 2016**. Since then, many other States namely Tamil Nadu, Madhya Pradesh, Rajasthan, Kerala, Maharashtra, Uttar Pradesh, Delhi, and Karnataka have reported cases subsequently.
- **Chikungunya, a viral disease endemic to India**, causes severe joint pain, fever, and rash, with no specific treatment.
 - Major outbreaks occurred in 1963, 1965, 1973, and later re-emerged in 2006, now affecting almost all states, especially urban and peri-urban areas.

Most common mosquito-borne diseases

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

Drishti Mains Question:

Q. Despite limited effectiveness, India continues to rely on fumigation for Aedes control? Discuss and suggest sustainable alternatives.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

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 thermochemical conversion of biomass

Ans: (a)

Q. Which one of the following is used in preparing a natural mosquito repellent? (2021)

- a) Congress grass
- b) Elephant grass
- c) Lemongrass
- d) Nut grass

Ans: c

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