

### 3. Zero Snakebite Death Initiative- Science & Technology

Assam's Demow Model is focus of ICMR project for 'zero snakebite deaths' India currently bears the world's highest burden of snakebite mortality, largely driven by delayed treatment and weak rural health linkages. In response, the Indian Council of Medical Research (ICMR) has launched the Zero Snakebite Death Initiative, a large-scale implementation research project.

By integrating community-based prevention, rapid response, and evidence-driven health system strengthening—drawing on successful local frameworks like Assam's Demow Model—the initiative aims to shift the focus from reactive hospital care to proactive early intervention, offering a realistic pathway to eliminating preventable snakebite deaths.

#### Current Status of Snakebite in India

Snakebite envenoming is a critical but often neglected public health challenge in India.

**Global Epicenter-** India accounts for the highest number of snakebite deaths globally, estimated at **58,000 deaths annually**.

**Demographic Distribution-** The burden is unevenly distributed, with higher incidence in rural, tribal, and agrarian regions.

**High-Burden States-** Uttar Pradesh, Bihar, Jharkhand, Odisha, Chhattisgarh, Assam, West Bengal, Andhra Pradesh, and Maharashtra.

**Primary Causes of Mortality-** Despite the availability of Anti-Snake Venom (ASV), high mortality persists due to Delayed reporting by victims. Poor referral systems between primary and tertiary care. Lack of trained healthcare personnel at peripheral facilities. Inconsistent ASV availability (supply chain issues).

**International Recognition-** The World Health Organization (WHO) recognizes snakebite envenoming as a Neglected Tropical Disease (NTD). India has responded by including snakebite management in national treatment guidelines and launching ICMR-led research.

#### About the ICMR Project- Zero Snakebite Death Initiative

This is a strategic intervention designed to create a scalable national blueprint for snakebite management.

**Nature of Project-** A four-year national implementation research project sanctioned by the ICMR.

**Timeline & Budget-** Scheduled to commence in January 2026 with a financial outlay of ₹13.5 crore.

#### Institutional Framework

**Lead Institution-** Amrita Institute, Kerala (responsible for coordination and research design).

**Geographical Coverage-** Seven diverse states Assam, Himachal Pradesh, Jharkhand, Kerala, Maharashtra, Odisha, and West Bengal.

**Primary Objectives-** To develop a unified, evidence-based, and replicable national model for prevention, early response, and clinical management. To generate high-quality implementation evidence that informs national policy and facilitates future scale-up.

#### The Demow Model of Assam

A key pillar of the initiative is the adoption of the successful Demow Model.

**Origin-** Developed in the Demow block of Sivasagar district, eastern Assam, a region historically plagued by high snakebite incidence.

**Recognition-** Validated by ICMR as a field-tested, community-based model successful in reducing deaths and complications.

**Core Philosophy-** It demonstrates that local participation and decentralized health responses are more effective than purely top-down approaches in rural settings.

#### Key Features

**Community Engagement-** Strong involvement of locals forms the foundation of prevention.

**Volunteer Training-** Local volunteers are trained in basic first response and safe practices.

**Myth-Busting-** Active awareness campaigns to reduce dependence on unsafe traditional healers/practices.

**Efficient Networks-** Establishment of robust referral and communication networks linking villages to health facilities.

**Golden Hour Focus-** Ensures rapid transport of victims to hospitals to minimize delays during the critical "golden hour."

### Integrated Regional Models

The project adopts a "best of" approach by integrating successful strategies from various states.

**Assam-** Community engagement and referral-based approach (Demow Model).

**Maharashtra-** Distribution and promotion of protective equipment (e.g., gumboots, torches) to reduce occupational exposure among farmers.

**Himachal Pradesh-** Strategy of administering Anti-Snake Venom (ASV) during patient transport (ambulance-based care) to reduce treatment delays.

**Kerala-** Utilization of digital tools for better coordination, real-time surveillance, and data-driven decision-making.

### Importance of the Initiative

**Tackling Massive Health Burden-** With nearly 50% of global snakebite deaths occurring in India, along with over 4 lakh amputations/disabilities (ICMR–Million Death Study), this initiative addresses a lethal health gap.

**Targeting Preventable Mortality-** Most deaths are due to delays, not a lack of cure. Timely ASV administration is highly effective; thus, a "zero death" target is theoretically achievable with better logistics.

**Promoting Community-Centric Care-** Since over 70% of deaths occur in rural areas lacking tertiary care, shifting focus to community empowerment and early referral is critical.

**Alignment with Goals-** Supports the WHO target to halve snakebite deaths and disabilities by 2030. Strengthens India's commitment to SDG 3 (Good Health and Well-being) and Universal Health Coverage (UHC).

### Challenges in Achieving Zero Deaths

**Delayed Access-** In many tribal/rural areas (e.g., Odisha, Jharkhand), travel time to hospitals often exceeds 2–4 hours, missing the "golden hour" window.

**Cultural Barriers-** Studies indicate 30–50% of victims first visit traditional faith healers, leading to fatal delays. This was a major issue identified in Assam's Sivasagar district prior to intervention.

### Health System Gaps

**ASV Shortages-** Poor cold-chain management and stockouts at Primary Health Centres (PHCs).

**Lack of Training-** Shortage of staff trained in ASV administration and anaphylaxis management.

**Bio-Diversity Issues-** Current ASV is primarily polyvalent against the "Big Four" snakes (Cobra, Krait, Russell's Viper, Saw-scaled Viper). Region-specific species (e.g., Hump-nosed Pit Viper in Western Ghats) lack specific antivenoms, complicating treatment.

**Data Deficit-** Significant underreporting exists as official hospital data captures only a fraction of actual incidents, hindering effective resource planning.

### Conclusion

The Zero Snakebite Death Initiative marks a paradigm shift from a reactive, hospital-centric approach to a preventive, community-driven public health strategy. By integrating proven frameworks like the Demow Model and leveraging technology (Kerala model) and logistical innovations (Himachal model), the project offers a realistic roadmap. While challenges like cultural reliance on healers and logistical gaps persist, sustained community engagement and institutional support can make "zero snakebite deaths" an achievable reality for India.

**Source-** <https://www.thehindu.com/news/national/assam/assams-demow-model-is-focus-of-icmr-project-for-zero-snakebite-deaths/article70392572.ece>