

COST-EFFECTIVENESS OF RABIES MONOCLONAL ANTIBODIES FOR RABIES POST-EXPOSURE PROPHYLAXIS IN INDIA

ICMR-National Institute of Epidemiology (NIE), Chennai
A Regional Resource Centre for Health Technology Assessment in India (HTAI)

Recommendations:

- Human monoclonal antibody (Human mAb) can be considered for inclusion under the National Rabies Control Programme (NRCP) as a replacement for the current strategy, as it was found to be feasible for programme implementation.
- Human mAb cocktail may be considered for use only after a price reduction of more than 26%, to make it cost-effective and suitable for inclusion under NRCP.

Key Findings:

- The incremental cost per QALY gained with Human mAb and Human mAb cocktail compared to the current scenario was ₹1,12,105 and ₹3,11,305, respectively.
- Human mAb provides 255 additional QALYs at an extra cost of ₹2.86 crore for 1,00,000 Category III exposures from a public payer perspective.
- The ICER for Human mAb (₹1,12,105 per QALY) is less than half of India's 2025 cost-effectiveness threshold (₹2,34,859 per QALY), confirming it is cost-effective.

Background:

- Rabies is an acute progressive encephalitic zoonosis, and once clinical symptoms appear, it is almost always fatal. (1)
- It is a neglected tropical disease (NTD) prevalent in over 150 countries, with India accounting for nearly 36% of global rabies deaths (~18,000-20,000 per year). (2)
- Category III exposures (transdermal bites or saliva contact with mucosa/broken skin) require wound care, anti-rabies vaccination, and infiltration of rabies immunoglobulin (RIG). (3,4)
- RIG – ERIG & HRIG coverage in India remains low (~11%), primarily due to high cost, cold-chain requirements, and limited availability. (5)
- Rabies monoclonal antibodies (RmAbs) – Human mAb and Human mAb cocktail – are WHO-endorsed, plasma-free alternatives to RIG with equivalent efficacy and improved production consistency. (6,7)

PICO	Description of the components
Population	Population eligible for RIG (CIII Rabies Exposure)
Intervention	Rabies Monoclonal Antibodies (Human mAb, Human mAb cocktail) and Human Rabies Immunoglobulin (HRIG)
Comparator	Current Scenario (90% ERIG + 10% HRIG, coverage ~11%)
Outcome	Cost and Health Benefits in terms of Quality adjusted life years

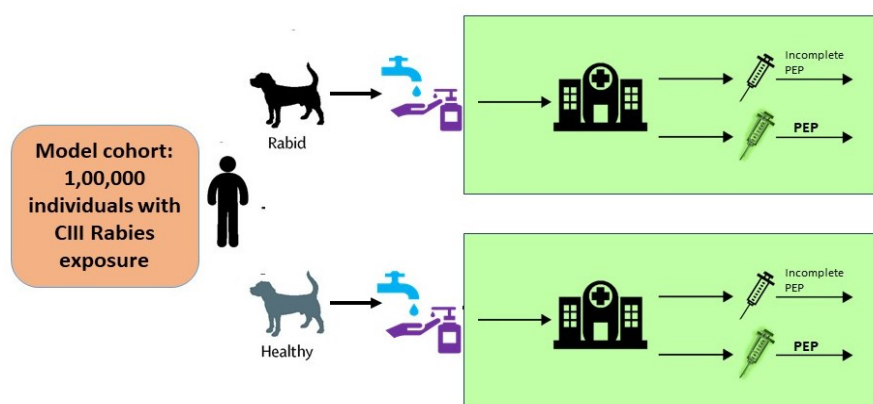


Figure 1: CUA model -decision tree

Results:

	Total cost (₹) (Cr)	Total QALYs	Incremental Cost (₹) CR	Incremental QALY	ICER
Human MAb	19.21	99,723	2.86	255	1,12,105
Human MAb cocktail	24.80	99,739	8.45	271	3,11,305
HRIG	73.80	99,732	57.46	265	21,68,738
Current scenario	16.34	99,467			

Budget Impact:

At existing coverage of ~11%, the incremental budget impact of Human mAb relative to current practice is estimated at ₹27.71 crore in 2026, rising gradually with population growth to ₹28.53 crore by 2030.

Conclusion:

- Cost effectiveness: The ICER/ QALY gained is ₹1,12,105 (0.47 times GDP per capita) for Human mAb and ₹3,11,305 (1.32 times GDP per capita) for Human mAb cocktail, as compared to the current scenario.
- A price reduction of 26% is required in current market price ₹ 1,440 per 600 IU (1 mL) /2,622 per 1,500 IU (2.5 mL) vial) of Human mAb cocktail to make it a cost-effective option for Rabies PEP in India.

References:

1. World Health Organization. Rabies vaccines: WHO position paper - April 2018. *Weekly Epidemiological Record*. 2018; 93(16): 201-220. <https://www.who.int/publications/i/item/who-wer9316-201-220>
2. Thangaraj JWV, Haradhanalli RS, Sadanandan R, et al. The National Rabies Burden Study: A community-based study to estimate human rabies deaths in India, 2022-2024. *Lancet Infect Dis*. 2025 (in press).
3. National Centre for Disease Control (NCDC). National Guidelines for Rabies Prophylaxis. New Delhi: Ministry of Health and Family Welfare, Government of India; 2019. <https://ncdc.mohfw.gov.in>
4. World Health Organization. WHO Expert Consultation on Rabies: Third Report. Geneva: World Health Organization; WHO Technical Report Series No. 1012; 2018. <https://www.who.int/publications/i/item/9789241210218>
5. Haradhanalli RS, Sudarshan MK, Thakur K, et al. Assessing cost and coverage of rabies prophylaxis in India: evidence from a multi-centre study. *Indian J Public Health*. 2019; 63(Suppl 1): S21-S28. doi: 10.4103/ijph.IJPH_374_19
6. Gogtay NJ, Munshi R, Ashwath Narayana DH, et al. Comparison of a Novel Human Rabies Monoclonal Antibody to Human Rabies Immunoglobulin for Postexposure Prophylaxis: A Phase 2/3, Randomized, Single-Blind, Noninferiority, Controlled Study. *Clin Infect Dis*. 2018; 66(3): 387-395. doi: 10.1093/cid/cix791.
7. Kansagra K, Parmar D, Mendiratta SK, et al. A Phase 3, Randomized, Open-label, Noninferiority Trial Evaluating Anti-Rabies Monoclonal Antibody Cocktail (Twinrab®) Against Human Rabies Immunoglobulin (HRIG). *Clin Infect Dis*. 2021; 73(9): e2722-e2728. doi: 10.1093/cid/ciaa779.