

Secular trends of rabies in India, 2005–2020: importance of surveillance and implications for elimination strategies

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India accounts for over one-third of global rabies deaths.¹ To address this problem, India has devised a national programme to eliminate Rabies (NRCP) by 2030.¹ Understanding secular trends of rabies is pivotal during the elimination phase. Therefore, we described rabies trends using data from the National Health Profile (NHP), a collection of state-wise monthly health condition reports between 2005 and 2020.

We computed incidence and calculated the average annual percentage change (AAPC) of incidence using Joinpoint regression. Rabies incidence showed a significant declining trend from 2.36 to 0.41 per 10 million population (AAPC = −11.3%, 95% CI: −13.9% to −8.7%, $p < 0.001$) (Fig. 1A and B). The NHP reported a total of 2863 rabies cases in India between 2005 and 2020; Five states contributed to over three-fourths of the total burden: West Bengal (43%), Andhra Pradesh (10%), Maharashtra (8%), Karnataka (7%) and Delhi (6%) (Fig. 1C & Appendix).²

In 2021, India declared human rabies notifiable,¹ ensuring accurate rabies incidence data, which is crucial for developing and implementing effective prevention and control measures. The NRCP reported 6644 cases of human rabies between 2012 and 2022,^{1,3} while the NHP reported 2863 cases between 2005 and 2020.² According to One-million Death Study, 12,700 rabies deaths were estimated in 2005,⁴ whereas the NHP reported 259 cases. Gross underreporting could be attributed to deaths outside hospital settings and preference for traditional healers for treatment.⁴ India has launched an integrated health information platform (IHIP) to collect real-time data using mobile applications to overcome these data limitations.

Currently, NRCP follows strategies such as prophylactic vaccination for both humans and dogs, enhanced public awareness, effective dog population

management, and inter-sectoral coordination.¹ While these measures have contributed to a decline in incidence, challenges like operational logistics, funding limitations, and public non-compliance poses constraints. Understanding and addressing the role of other carriers, such as bats and monkeys, is also crucial. In certain regions, these species may also act as rabies virus reservoirs, necessitating broader wildlife surveillance and management strategies.¹

The Tripartite alliance of WHO, World Organisation for Animal Health, and Food and Agriculture Organization, has been working collaboratively to manage health risks using 'One Health' approach.⁵ This multi-sectoral collaboration aims to jointly develop evaluation frameworks for epidemiology and surveillance, support a shared vision of global health security, and informed decision-making. Adopting these One Health capacity-strengthening exercises could significantly enhance India's rabies control efforts and could pave the way towards the elimination of human rabies by 2030.

Contributors

PR: conceptualisation and writing—original draft. PR, MGM, NJ, MS, YK: Data curation, formal analysis, investigation, methodology, software, supervision, validation, visualisation, and writing—review & editing.

Data sharing statement

All the data used in our report are available in public domain and can be obtained from the National Health Profile (NHP) reports.

Editor note

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Declaration of interests

None.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.lansea.2023.100322>.



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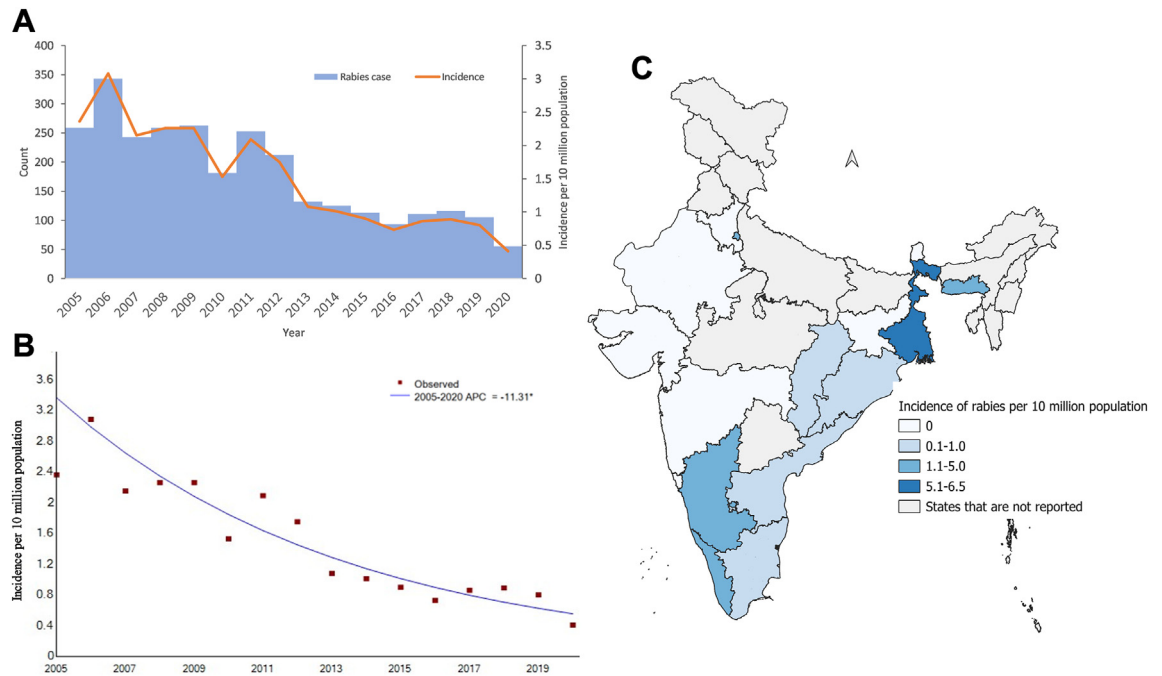


Fig. 1: (A) Rabies cases and incidence by year, 2005–2020. (B) Joinpoint trend analysis of rabies incidence in India, 2005–2020. (C) Incidence of rabies by states, India, 2020.

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