



Foot-and-Mouth Disease: The Hidden Economic Cost of a Highly Contagious Livestock Disease

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Foot-and-mouth disease (FMD) is one of the most contagious viral diseases affecting cloven-hoofed animals, including cattle, buffaloes, sheep, goats and pigs. It is caused by foot-and-mouth disease virus (FMDV), a virus belonging to the genus *Aphthovirus* and family *Picornaviridae*. Seven immunologically distinct serotypes are recognised: O, A, C, Asia 1, SAT 1, SAT 2 and SAT 3. Immunity against one serotype does not necessarily protect an animal against another, making appropriate vaccine selection and surveillance essential. The disease spreads through contact with infected animals, respiratory secretions, saliva, contaminated equipment and animal products. Common clinical signs include fever, excessive salivation, blisters or erosions in the mouth and around the feet, and severe lameness. Painful teat lesions can interfere with milking. Although many adult animals survive, milk production may decline, growth can be impaired and young animals may experience severe disease. In India, where dairy farming is an important source of rural income and nutrition, FMD is not merely a veterinary concern. It can reduce household earnings, increase treatment and management costs, disrupt livestock movement and affect animal-product trade. Its economic importance makes sustained vaccination, early outbreak reporting and effective biosecurity essential components of livestock disease control.

What do the data reveal?

A systematic review published in 2022 analysed 73 FMD studies covering the period 1986–2021 and approximately 500,267 samples. It estimated a pooled prevalence of 43%, although results varied by study period, region, species and diagnostic method. This figure represents a synthesis of historical studies, not the proportion of Indian livestock currently infected.

Table 1. Selected findings from the Indian FMD systematic review

Indicator	Reported estimate
Studies included	73
Samples analysed	500,267
Pooled prevalence	43%
95% confidence interval	35–52%
Cattle prevalence estimate	45%
Buffalo prevalence estimate	30%
Eastern region estimate	59%
Central region estimate	24%

Source: Krishnamoorthi et al. (2022). Estimates reflect the studies and methods included in the review.

More recent government reporting provides a different measure: reported outbreaks rather than pooled prevalence. A Ministry of Fisheries, Animal Husbandry and Dairying release published in March 2026 reported that FMD outbreaks declined from 132 in 2019 to 32 in 2025. The same release reported average seroconversion of 70% and a decline in average non-structural protein (NSP) antibody prevalence from 16% during 2021–23 to 7.8% in the

latest period reported. These indicators suggest progress, but outbreak counts alone cannot establish that transmission has stopped.

Table 2. Selected government indicators of FMD control in India

Indicator	Reported value
FMD outbreaks in 2019	132
FMD outbreaks in 2025	32
Reduction in reported outbreaks	Approximately 75.8%
Average seroconversion reported	70%
NSP antibody prevalence during 2021–23	16%
Latest NSP antibody prevalence in the cited release	7.8%

Source: Government of India, Press Information Bureau, March 2026. These indicators should be interpreted in the context of the surveillance and vaccination programme.

The economic cost of infection

An Indian economic assessment published in 2013 estimated annual FMD-associated losses at ₹12,000–14,000 crore. Its analysis attributed 49.83% of estimated losses to milk-production losses, 16.15% to opportunity costs and 12.20% to reduced growth. These are historical estimates and should not be presented as current annual losses without a new assessment.

Table 3. Selected economic estimates from the historical Indian assessment

Measure	Reported estimate
Total annual national losses	₹12,000–14,000 crore
Milk-production losses	49.83%
Opportunity costs	16.15%
Reduced growth	12.20%

Source: Singh et al. (2013). Categories may not be directly comparable or additive unless the original study's accounting method is followed.

These losses arise because sick animals may eat less, walk with difficulty, produce less milk and require additional care. Farmers may also lose income when animal movement or sales are restricted during outbreaks. For smallholders, even a temporary reduction in milk sales can affect the money available for feed, household expenses and veterinary services.

Prevention and control priorities

FMD control requires coordinated action by farmers, veterinarians, diagnostic laboratories and livestock authorities. Key measures include:

- Vaccinating susceptible animals according to official schedules and recommendations.
- Maintaining the vaccine cold chain and accurate vaccination records.
- Reporting suspected cases promptly to veterinary authorities.
- Isolating affected animals and following official movement-control instructions.
- Cleaning and disinfecting contaminated equipment, vehicles and animal housing.
- Strengthening laboratory confirmation and surveillance of circulating virus serotypes.
- Improving farmer awareness of early signs and the importance of completing scheduled vaccination.

FMD is primarily an animal-health and economic concern rather than a major human-health threat. Nevertheless, its effects on dairy income, livestock productivity and trade make it important for rural development and food-system stability.

Conclusion

FMD demonstrates how a highly contagious livestock disease can affect much more than animal health. Historical Indian research documents a substantial disease burden, while government reporting indicates a decline in reported outbreaks between 2019 and 2025. These findings support continued investment in vaccination, surveillance, biosecurity and

rapid outbreak response. The long-term objective should be to sustain control gains while improving the reliability of surveillance data. Protecting livestock from FMD is ultimately an investment in farm productivity, rural livelihoods and the resilience of India's dairy sector.

References

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