ASSESSMENT OF THE COST-EFFECTIVENESS OF HOSHINO MUMPS VACCINE AMONG CHILDREN IN INDIA: EVIDENCE FROM A DECISION-TREE MODEL

EE33

ISPOR Asia Pacific Summit 2026

Harsimran Kaur[1],Yogesh K. Gurav[1], Biju Soman[2], Amol Deshmukh[1], Nitin Ambadekar[3], Harikumar S[4], Aarti Kinikar[5], Pravin Sawant[6], Rehna C Mohamed[2]

[1]Health Economist, Health Technology Assessment Resource Center, ICMR-National Institute of Translational Virology and AIDS Research, Pune, India
[2]Health Technology Assessment Resource Center, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India
[3]State Health System Resource Centre, Pune, Health services, Govt. of Maharashtra, India
[4]Directorate of Health Services, Thiruvananthapuram, Govt. of Kerala, India

Introduction

- **Mumps outbreaks:** From 2015-2024, India reported a total of 80,970 mumps cases in outbreaks across states. In 2024 alone, Kerala saw the highest spike with over 76,000 cases, making it the state with highest incidence of mumps.
- **Measles-Rubella (MR) vaccination:** In the Indian Universal Immunization programme, mumps vaccine is not administered, only MR is delivered.
- **Mumps Vaccine recommendation**: Indian Academy of Pediatrics (IAP) supports MMR vaccine inclusion in the UIP of India.
- **Mumps Virus genotypes:** The virus genotypes causing mumps in India are predominantly Genotype C and in some areas, genotype G is also prevalent.
- **Types of mumps vaccines:** Leningrad-Zagreb (L-Z) (Genotype N) (INR 153/dose) and Jeryl Lynn (JL) (Genotype A) (INR 856/dose) mumps vaccine strains have shown neutralization against the circulating mumps genotypes in India.
- **Hoshino strain vaccine:** However, a third mumps vaccine made from the **Hoshino strain (Genotype B) (INR 814/dose)** is also commercially available in the Indian market, and has shown effectiveness in Asian countries (for e.g. Japan)

Need of the study:
Cost-effectiveness data to support this vaccine's inclusion in Universal Immunization programme is lacking and warranted to estimate the potential benefits of its introduction.

Objective

To conduct the cost-effectiveness analysis (CEA) for inclusion of the Hoshino strain mumps vaccine in the current routine Measles Rubella (MR) immunization programme for children in India, using a decision-tree analytical framework

Methodology

Population
Children

Intervention: Hoshino strain mumps vaccine
1st dose:9 to 12 mos. of age | 2nd dose:16 to 24 mos. of age

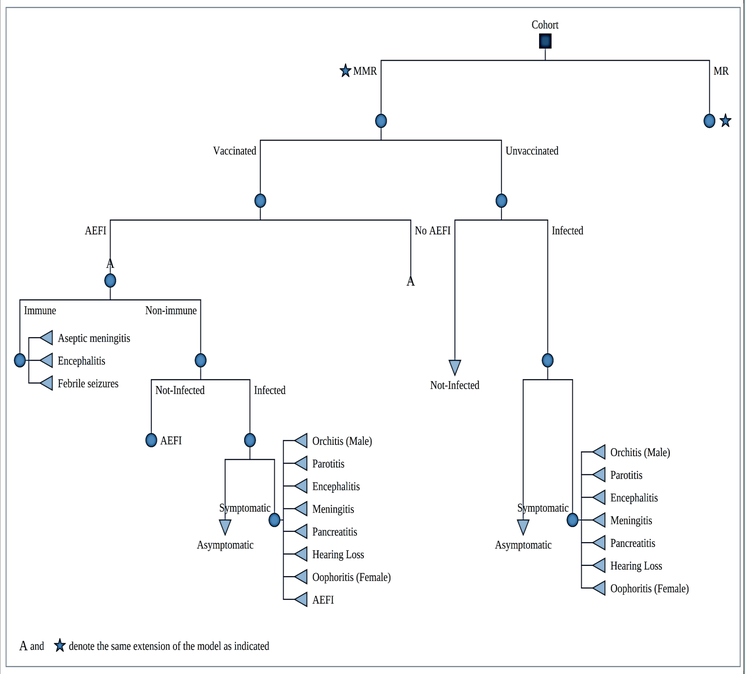
Comparator: MR Vaccine
1st dose:9 to 12 mos. of age | 2nd dose:16 to 24 mos. of age

Outcomes: Incremental cost-effectiveness ratio (ICER)
ICER/mumps case averted | ICER/QALY gained

Perspective
Abridged Societal Perspective

Horizon
Lifetime horizon

Decision Tree Model



Model Parameterization

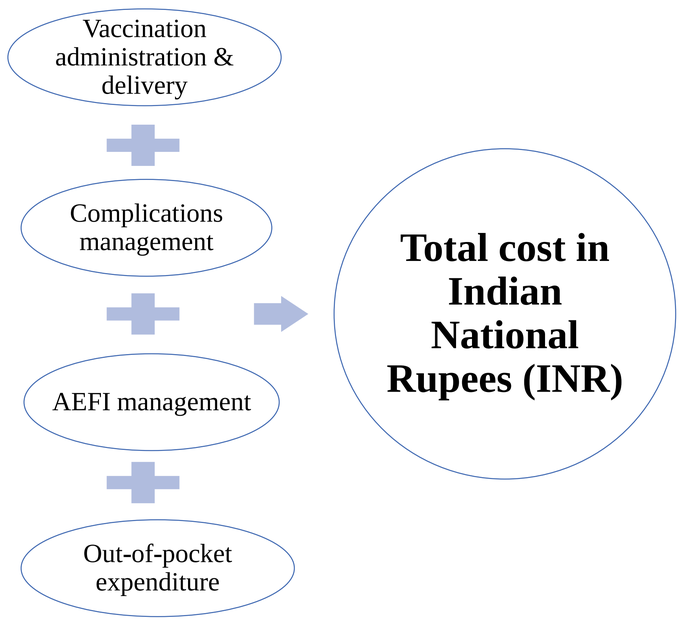
Following probabilities were accounted for:

- ✓ Probability of getting vaccinated
- ✓ Probability of acquiring adverse events following immunization (AEFIs)
- ✓ Probability of being non-immune from mumps
- ✓ Probability of acquiring infection
- ✓ Probability of acquiring complications

Health state utility and duration values were calculated for the following to derive QALYs:

- ✓ Complications
- ✓ AEFIs

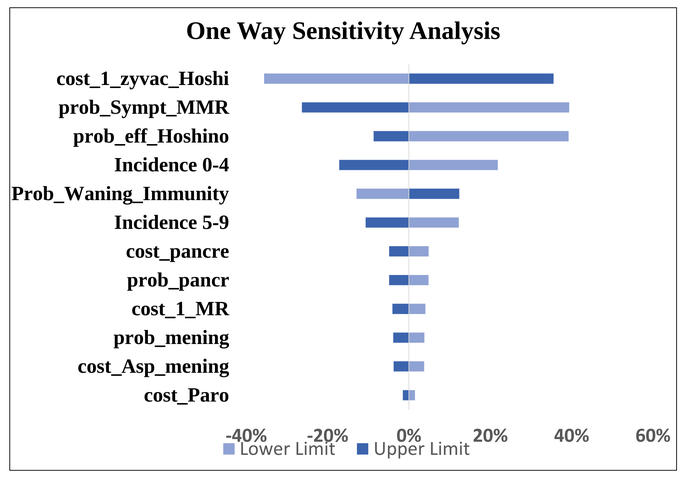
Costs

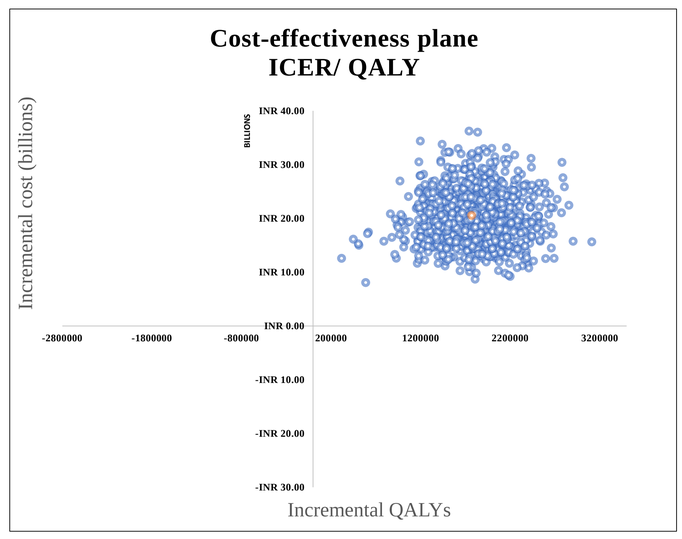


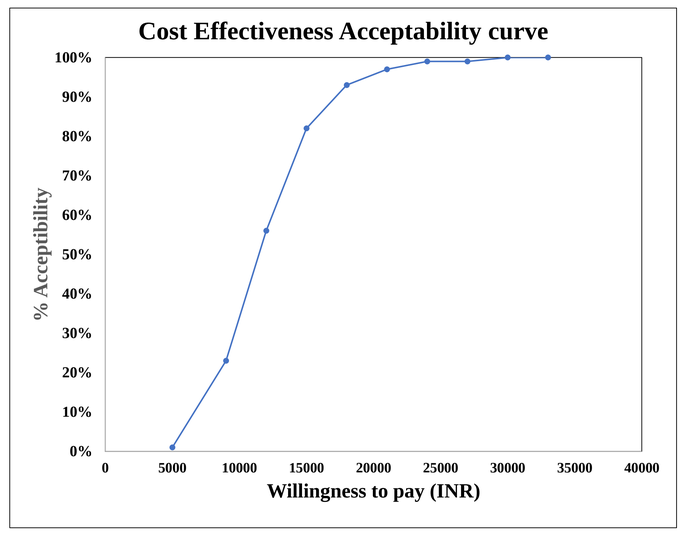
Results

INR/Billions →	Cost	Cases	QALYs
Intervention	**49.6**	**2805284**	**636229183**
Comparator	29.3	5450277	634421746
Incremental value	20.3	2644993	1807436
ICER (Cases averted)	7,676.88	**Cost incurred per case averted**	
ICER (QALYs)	11,234.30	**Cost incurred per QALY gained**	

Results







Discussion

Strengths:
- ❑ The first cost-effectiveness analysis on introducing Hoshino mumps vaccine among children in India.
- ❑ Presented the ICER's considering two outcomes: mumps cases averted and QALYs gained.

Limitations:
- ❑ Mumps burden estimates are not nationally representative and taken from state-specific data
- ❑ The lack of data on utility values of mumps complications and AEFIs from Indian population

Conclusion

- ➢ The introduction of Hoshino mumps vaccine in the current MR immunization schedule for children is a cost-effective measure. The ICER per cases averted and QALY gained is appreciably below the 1 GDP per capita of India, i.e. INR 2,30,000/-.

Acknowledgements

Health Technology Assessment India (HTAIn), Department of Health Research, Ministry of Health and Family Welfare, Govt. of India for this opportunity to present their research.

References

1. Immunization :: National Health Mission, Ministry of Health and Family welfare [Internet]. [cited 2025 May 7]. Available from: https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=824&lid=220
2. Kuter BJ, Marshall GS, Fergie J, Schmidt E, Pawaskar M. Prevention of measles, mumps and rubella: 40 years of global experience with M-M-RII. Hum Vaccin Immunother. 17(12):5372–83.
3. Lam E, Rosen JB, Zucker JR. Mumps: an Update on Outbreaks, Vaccine Efficacy, and Genomic Diversity. Clinical Microbiology Reviews. 2020 Feb 26;33(2):10.1128/cmr.00151-19.
4. Vashishtha VM, Yadav S, Dabas A, Bansal CP, Agarwal RC, Yewale VN, et al. IAP position paper on burden of mumps in India and vaccination strategies. Indian Pediatr. 2015 June;52(6):505–14.
5. Home :: Integrated Disease Surveillance Programme(IDSP), Ministry of Health and family welfare [Internet]. [cited 2025 Apr 26]. Available from: https://idsp.mohfw.gov.in/
6. Zhou F, Reef S, Massoudi M, Yusuf HR, Bardenheier B, Zimmerman L. An Economic Analysis of the Current Universal 2-dose measles-mumps-rubella Vaccination Program in the United States. Hinman AR, Papania MJ, McCauley MM, editors. The Journal of Infectious Diseases. 2004 May 1;189(Supplement_1):S131–45
7. Global Burden of Disease Study 2021 (GBD 2021) Data Resources | GHDx [Internet]. [cited 2026 Aug 28]. Available from: https://ghdx.healthdata.org/gbd-2021
8. Oh C, Rafai E, Cho Y, Jun D, Cha S. An Economic Analysis of Mumps Vaccination in Fiji: Static Model Simulation of Routine Measles–Mumps–Rubella (MMR) Vaccination Instead of Current Measles–Rubella (MR) Vaccination. IJERPH. 2022 Feb 7;19(3):1861. doi:10.3390/ijerph19031861
9. Hoshi S ling, Okubo R, Tabuchi K, Seposo X, Shono A, Kondo M. Cost-effectiveness analyses of monovalent mumps vaccination programs for Japanese children. Vaccine. 2022 Sep;40(37):5513–22. doi:10.1016/j.vaccine.2022.08.004
10. Kirkham FJ, Vigevano F, Raspall-Chaure M, Wilken B, Lee D, Le Reun C, et al. Health-related quality of life and the burden of prolonged seizures in noninstitutionalized children with epilepsy. Epilepsy & Behavior. 2020 Jan;102:106340. doi:10.1016/j.yebeh.2019.04.058
11. Prinja S, Brar S, Singh MP, Rajsekhar K, Sachin O, Naik J, et al. Process evaluation of health system costing – Experience from CHSI study in India. PLoS One. 2020 May 13;15(5):e0232873. doi:10.1371/journal.pone.0232873 PubMed PMID: 32401763; PubMed Central PMCID: PMC7219765.