



COST-EFFECTIVENESS ANALYSIS OF JAPANESE ENCEPHALITIS VACCINE IN ARMED FORCES PERSONNEL POSTED IN JE ENDEMIC REGIONS

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Recommendations

- Japanese Encephalitis (JE) vaccination is cost-effective from societal perspective and is cost saving for Armed Forces perspective.
- The intervention is an operationally strategic intervention, and its implementation shall significantly strengthen the health resilience of the Armed Forces in JE-endemic regions.

Key Findings

- JE vaccination strategy provides a health gain of 43.59 DALY averted, with additional costs of ₹7347544 from societal perspective and incremental cost saving of ₹19659679 from Armed Forces perspective.
- The incremental cost-effectiveness ratio (ICER) is ₹168551 per DALY averted from societal perspective. From Armed Forces perspective the ICER is cost saving with ₹4,50,989 per DALY averted.

Background:

- Japanese Encephalitis is a vector borne zoonotic viral disease endemic in many parts of Southeast Asia and India
- JE has a 20-30% case fatality rate, with 30-50% of survivors suffering permanent neurological sequelae. In case of outbreaks, case fatality rate approaches 50%. There is no specific treatment – vaccine is the key preventive measure
- Armed Forces Personnel deployed in endemic regions face continuous JE exposure due to outdoor field duties leading to high mortality and long-term neurological disability, affecting both health and military performance. While childhood vaccination is widespread, no structured adult JE vaccination exists for Armed Forces

PICO	Description of the components
Population	Armed Forces personnel posted in JE endemic region with average four years of deployment
Intervention	JE Vaccine administered as two doses
Comparator	No JE vaccination
Outcome	ICER per DALYs averted

Japanese Encephalitis Vaccine (JENVAC)

No specific treatment — vaccine is the key preventive measure

JE vaccine recommended by NCVBDC in India-JENVAC 2 dose has been started in 42 districts

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As per Govt. of India guidelines, 2 doses of JE vaccine have been approved in UIP to be given one along with measles at the age of 9 months and the second dose with DPT booster at the age of 16-24 months w.e.f. April, 2013. JE vaccination in routine immunization has been included in 334 districts out of 355 districts which are considered as endemic districts.

The adult JE vaccination was started in 42 districts of three states where JE incidence is occurring among the adult population, namely Assam (9 districts), Uttar Pradesh (7 districts) and West Bengal (26 districts). JENVAC JE vaccine is used for adult population (15+) in India.

Results:

Population of 100000 Cohort	Cost (Discounted) (₹)	DALY (Discounted)	Incremental Cost (Discounted)(₹)	Incremental DALY gain (Discounted)	ICER (₹)/DALY Averted
Intervention	74.32 lacs	0.3029			
Comparator	83,973.58	43.8952			
			73.48 lacs	43.5924	1,68,551.16

Societal Perspective

Population of 100000 Cohort	Cost (Discounted)(₹)	DALY (Discounted)	Incremental Cost (Discounted) (₹)	Incremental DALY gain (Discounted)	ICER (₹)/DALY Averted
Intervention	76.19 lacs	0.3029			
Comparator	2.73 crores	43.8952			
			-1.97crores	43.5924	-4,50,989

Armed Forces Perspective

Budget Impact:

- The total vaccination cost over five years is ₹ 5.33 crore, with the highest expenditure in Year 1 (₹ 2.42 crore) due to mass immunization, followed by ₹ 72.72 lakh annually for subsequent cohorts.
- Over this period, the program is estimated to avert 10.92 JE cases and 2.40 deaths. Corresponding treatment cost savings totaled ₹ 5.6 lakh, while pension savings from averted premature deaths amounted to ₹ 14.69 crore.

Conclusion:

- The cost of the intervention is more than the comparator, however it delivers better health outcomes (fewer DALYs). The health gains are averted of 43.59 DALY. The ICER of Rs 1,68,551/- indicates that the intervention is cost effective at present willingness to pay threshold of Rs 2,30,892/- from societal perspective.
- For Armed Forces perspective the intervention is cost saving with an ICER of -4,50,989/- per DALY averted.
- The maximum saving is in terms of disability pension in case of morbidity and training cost saved by

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