

**Strengthening Public Health Competencies through Field-Based Experience from a Pulse Polio Immunisation Day in Perambalur District, Tamil Nadu, India**

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Abstract

Background: Sustained vigilance through periodic National/Sub-National Immunisation Days remains essential to prevent re-emergence of poliovirus in India even after the country's polio-free certification by the World Health Organization on 27 March 2014. Community Medicine internship postings provide an

opportunity for interns to translate classroom learning on the Pulse Polio Programme into field practice.

Methods: Thirty Compulsory Rotatory Medical Internship (CRMI) interns of the Department of Community Medicine, DSIMSH, underwent a pre-activity orientation on polio epidemiology, bivalent oral polio vaccine (bOPV) cold-chain requirements, vaccine

vial monitor (VVM) interpretation and adverse-event-following-immunisation (AEFI) reporting, and were then deployed in 12 groups across booths in Perambalur district on the Pulse Polio Immunisation Day, 28 June 2026. Booth-wise coverage and vial-utilisation data were extracted from the consolidated duty/tally sheet.

Results: A total of 2122 children under five years were immunised with bOPV across 12 booths. Vial accounting showed 172 full vials received/utilised against 50 returned unused, 11 partial vials returned, and 111 empty vials returned. Key learning outcomes included practical application of VVM-based go/no-go decisions, cold-chain vigilance under ambient summer heat, and improved risk-communication skills for addressing vaccine hesitancy.

Conclusion: Structured field participation in the Pulse Polio Immunisation Day strengthened interns' practical competence in immunisation-programme delivery and reinforced that sustained polio-free status depends on the continued commitment of frontline health teams.

Keywords: Pulse Polio Immunisation, Oral Polio Vaccine; Vaccine Vial Monitor, Medical Internship, Community Medicine, Field Training.

Introduction

India was declared polio-free by the World Health Organization (WHO) on 27 March 2014, marking a monumental achievement in public health¹. However, sustained vigilance through periodic National and Sub-National Immunisation Days (NIDs/SNIDs) remains critical to prevent the re-emergence of wild poliovirus (WPV) or vaccine-derived poliovirus (VDPV), particularly due to persistent transmission in neighboring endemic regions^{2,3}. Lessons from the past emphasize that gaps in immunization coverage among migratory and

vulnerable populations can jeopardize long-term eradication goals⁴⁻⁶.

As part of their Compulsory Rotatory Medical Internship (CRMI), interns of the Department of Community Medicine, Dhanalakshmi Srinivasan Institute of Medical Sciences & Hospital (DSIMS&H), participated in the Pulse Polio Immunisation Day on 28 June 2026 across Perambalur district, organised in collaboration with District Health Authorities under the Directorate of Public Health, Tamil Nadu. This report describes the organisation, booth-wise implementation, and learning outcomes of this field activity, with the objective of documenting coverage and vial-utilisation performance and reflecting on the training value of structured field deployment for medical interns.

Materials and Methods

Pre-activity orientation

A pre-activity orientation session for all participating interns covered polio epidemiology, the structure of the Pulse Polio Programme, bOPV cold-chain requirements (2°C–8°C), booth-level operational procedures, recognition and reporting of adverse events following immunisation (AEFI), and tally/register documentation. Particular emphasis was placed on interpretation of the Vaccine Vial Monitor (VVM): vials at VVM Stage 1–2 was considered usable (Stage 2 vials prioritised for immediate use), while vials at VVM Stage 3–4 were discarded and reported to the supervising Medical Officer without administration. The VVM is a time-temperature sensitive indicator that changes colour as the vaccine is exposed to cumulative heat, letting health workers know whether the vaccine has exceeded a pre-set limit beyond which it should not be used

Field deployment

Thirty CRMI interns were deployed in 12 groups across designated booth sites in Perambalur district. At each booth, teams set up the site, verified VVM status on vaccine carriers on arrival, administered bOPV with left-little-finger marking of immunised children, maintained tally registers, screened for AEFI, counselled hesitant caregivers, and submitted end-of-day summary reports. Booth-wise coverage and vial-utilisation figures were subsequently consolidated from the CRMI duty/tally sheets. The booths were located at easily accessible places such as government hospitals, health centres, primary health centres, urban health centres, anganwadis, private hospitals, libraries, schools and buildings of voluntary organisations.

Observations and Results

A total of 2122 children under five years of age were immunised with bOPV across the 12 booths staffed by the 30 deployed interns (Table 1). Coverage per booth ranged from 39 children (Aranarai UHWC) to 428 children (Urban PHC), reflecting differences in catchment population and booth type (fixed institutional booths versus health-facility-based booths). Vial accounting across all booths recorded 172 full vials received/utilised against 50 full vials returned unused, 11 partially used vials returned, and 111 empty vials returned for disposal, consistent with expected wastage patterns for a single-day immunisation drive.

Table 1: Booth-wise coverage and vial utilisation during the Pulse Polio Immunisation Day, Perambalur district, 28 June 2026 (n = 12 booths)

Sn.	Booth / site	CRMI (n)	Under-5 immunised (n)	Full OPV vials recv./ret.	Partial OPV vials recv./ret.	Empty vials returned
1	Moulana School, Madharasa Road, Perambalur	3	71	11 / 7	0 / 1	3
2	Maragatham School, Renga Nagar, Perambalur	3	74	11 / 7	0 / 1	3
3	Crescent School, Super Nagar, Perambalur	3	186	12 / 1	0 / 1	10
4	Ramakrishna School, Elambalur Road, Perambalur	3	173	16 / 8	0 / 1	7
5	Dominic School, Sangupettai, Perambalur	3	46	7 / 3	0 / 1	2
6	Fathima School, Bazaar Street, Sangupettai	2	114	11 / 4	0 / 1	6
7	Perambalur North HSC, Muthunagar	3	411	28 / 5	0 / 1	22
8	Thanthai Roever School,	2	134	13 / 6	0 / 1	7

	Sangupettai, Perambalur					
9	Mariyamman Kovil Street AWC, Thuraimangalam	2	76	14 / 9	0 / 1	4
10	TELC School, Thuraimangalam	2	370	21 / 0	0 / 1	20
11	Urban PHC	2	428	26 / 0	0 / 1	25
12	Aranarai UHWC	2	39	2 / 0	0 / 0	2
	Total	30	2122	172 / 50	0 / 11	111

CRMI: Compulsory Rotatory Medical Internship; OPV: Oral polio vaccine; recv.: received; ret.: returned.

Discussion

Key learning outcomes

- VVM interpretation moved from an academic concept to a routine go/no-go clinical check applied at the level of the individual vial.
- Cold-chain vigilance under ambient summer heat highlighted the practical urgency of scheduled ice-pack replenishment during a field drive.
- Counselling caregivers on the rationale for 'additional protection' beyond routine immunisation improved interns' risk-communication skills around vaccine hesitancy.
- Coordination across booths and mobile vaccination routes illustrated the logistics underlying district-wide programme delivery.
- Accurate tally and register documentation reinforced its role in feeding booth-level data into district, state, and national coverage reporting systems.

Field challenges

- Vaccine hesitancy among some caregivers caused counselling delays and queue build-up at a few booths.
- Migrant and transient families at transit points were at risk of being missed on follow-up rounds.

- High ambient temperature demanded closer monitoring of ice-pack status within vaccine carriers.
- Local dialect variation required adaptive communication strategies at some sites.

These observations align with documented operational challenges in pulse polio drives across India, such as community hesitancy driven by myths and 'programmatic fatigue' in the post-certification era^{4,5}. Strengthening social mobilization through community influencers⁷ and reinforced media communication remains essential to overcome these barriers and maintain high coverage.

Strengths

A major strength of this field activity was the structured pre-activity orientation, which translated academic knowledge of Vaccine Vial Monitor (VVM) and cold-chain maintenance into practical clinical decisions. The involvement of medical interns as social mobilizers provided a unique opportunity to address vaccine hesitancy through direct community engagement, thereby bridging the gap between classroom learning and public health practice.

Limitations

This report is limited by its focus on a single district (Perambalur) and a single-day immunization drive,

which may not capture long-term trends or seasonal variations in vaccine uptake. Additionally, the data relies on booth-level consolidation, which might be subject to minor tallying variations under high-workload conditions.

Recommendations

Based on the field observations, it is recommended to:

- Strengthen local social-mobilization strategies by involving community leaders and influencers to address persistent hesitancy.
- Integrate reinforced media communication and tailored messaging for migratory populations to significantly improve turnout during NIDs.
- Establish more transit and mobile booths at railway stations, bus stands, and areas with large public gatherings to reach transient populations.
- Make structured field-based participation a core component of medical internship programs to build a competent public health workforce.

Conclusion

Structured participation of CRMI interns in the Pulse Polio Immunisation Day bridged classroom learning with ground-level public health practice across 12 booths in Perambalur district, resulting in 2122 children under five years being immunised with bOPV. The exercise reinforced that sustaining India's polio-free status depends on the continued commitment of every frontline provider, and it strengthened interns' practical skills in cold-chain monitoring, VVM-based decision-making, caregiver counselling, and immunisation-programme documentation.

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