

# Training of Service Providers for Pneumococcal Conjugate Vaccine Introduction in India: Results of Pre & Post Evaluation

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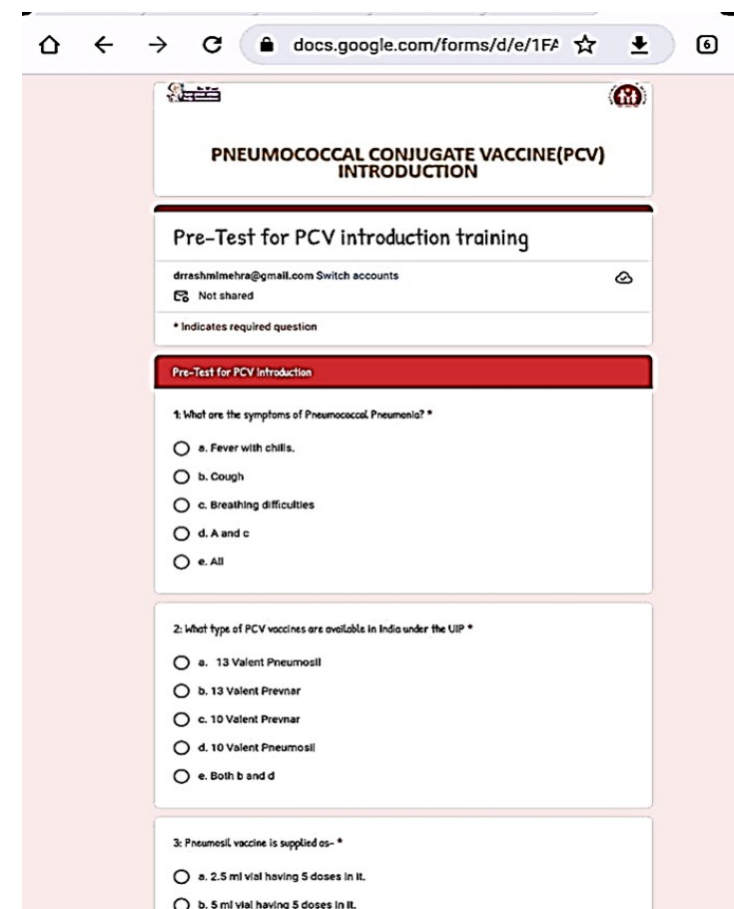
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## BACKGROUND

- India has highest burden of pneumococcal disease caused by *Streptococcus pneumoniae* globally<sup>1</sup>
- Estimated episodes of severe pneumonia and deaths in <5 yrs children in 2015- 6.9 million and 0.17 million<sup>2</sup>
- Pneumococcal Conjugate Vaccine (PCV) introduced in 2017 in 5 high burden states of India with nationwide expansion in 2021 as per the recommendation in 2021-22 budget
- Training of Healthcare workers (health staff) is a crucial component of a new vaccine introduction<sup>3</sup>
- Training modules, frequently asked questions (FAQs) & educational flyers were developed on operationalization of vaccine
- Expansion of PCV happened during pandemic → Necessitating virtual training → Cascaded training model adopted<sup>4</sup>
- Two national level ToTs conducted followed by district and block level trainings of health staff



## RESULTS

- Total of 668 pre-post evaluation survey responses were received.
- Mean score of correct answers on the post training evaluation (7.11) significantly higher than pre training (5.30)

Variable		Frequency (n)	Percent (%)
State	Assam	287	43
	Chhattisgarh	53	7.9
	Meghalaya	65	9.7
	Mizoram	47	7.0
	Odisha	121	18.1
	Sikkim	49	7.3
	Uttarakhand	46	6.9
	Total	668	100
Designation	Medical Officer	187	28
	Program Manager	136	20.4
	Support staff	157	23.5
	Vaccinator	182	27.2
	Total	668	100

Table 1: Geographic and designation distribution of respondents (n= 668)

Designation	Variable: Assessment score					
	Mean (Pre-training)	Mean (Post training)	Difference in mean	SD	t-value	Sig
Program Manager	5.34	7.13	-1.794	2.972	-7.041	<0.01*
Medical Officers	5.43	7.12	-1.684	2.975	-7.742	<0.01*
Vaccinators	5.37	7.04	-1.670	3.156	-7.254	<0.01*
Support Staff	5.01	7.12	-2.134	3.026	-8.836	<0.01*

Table 2: Paired T-test result for pre and post training score results (n=668; p<0.05 considered significant)\*

S. No.	Question	Freq of correct responses		%age change in pre-post test training scores	McNemar Test (p value)
		Pre	Post		
1.	Symptoms of Pneumococcal Pneumonia	542	552	1.8%	0.50
2.	Types of PCV available in India under the UIP	263	461	43.0%	<0.01*
3.	Presentation of PCV	401	492	18.5%	<0.01*
4.	Schedule of PCV vaccination under UIP	402	580	30.7%	<0.01*
5.	Sequence of administration of UIP vaccines after the introduction of PCV	329	407	19.2%	<0.01*
6.	Type of VVM in PCV	305	405	24.7%	<0.01*
7.	Storage and transportation of PCV	375	549	31.7%	<0.01*
8.	Contraindications to PCV administration	323	417	22.5%	<0.01*
9.	Interchangeability of PCV under UIP	337	425	20.7%	<0.01*
10.	Maximum age limit for starting with the first dose of PCV	263	460	42.8%	<0.01*

Table 3: Frequency of correct responses, %age change in scores of pre-post test & McNemar test result for pre-post training comparison between number of correct responses against each question (n=668; p<0.05 considered significant)\*

## AIM

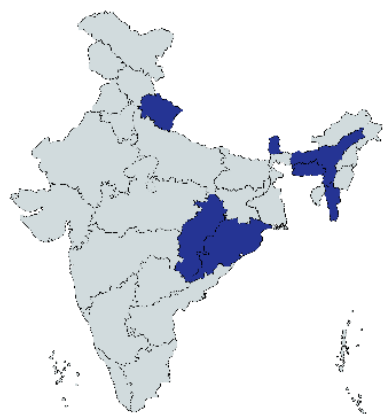
To evaluate the knowledge enhancement of the healthcare workforce (program managers, medical officers, vaccinators and support staff) following training for PCV introduction in the selected states of India.

## METHODS

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### Study Design

- Pre-post interventional study
- Geographical scope: 7 states



- Training duration: 1 day

3

### Study Tools & Data Collection

- Self-administered, Structured, close ended, pre-post test Google survey form links circulated online (WhatsApp groups) before & after training
- Number of questions- 10
- Time allotted- 20 minutes

\* \*Dhand, N. K., & Khatkar, M. S. (2014). Statulator: An online statistical calculator. Sample Size Calculator for Comparing Two Paired Means. Accessed 25 September 2023 at <http://statulator.com/SampleSize/ss2PM.html>

2

### Study Participants

- Healthcare workforce trained- program managers, medical officers, vaccinators & support staff
- Sample size (n): 41 pairs to achieve a power of 80% and a level of significance of 5% (two sided), for detecting an effect size of 0.45 between pairs.\*
- With 10% non-survey response rate, sample size= 316
- Sampling Method: Purposive

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### Data Analysis

- Software used: SPSS version 25
- Statistical tests employed: Paired t-test, Mc Nemar's test

## CONCLUSION

- Study highlighted importance of training health staff for the successful implementation of new vaccine introduction programs.

### Strengths

- All cadres of the healthcare workforce was assessed.
- Good response rate
- Study was conducted in the hard to reach geographies

### Limitations

- Questionnaire for all levels of healthcare staff was kept same.
- Feedback on training was not taken from the participants to pin point lacking areas.

## RECOMMENDATIONS

- A larger-scale study with larger sample size should be considered. Mixed-methods strategy could be employed to evaluate perspectives of the health staff regarding any new vaccine training.
- Further, a skill-based assessment (Objective Structured Clinical Examination) to understand the training effectiveness and ensure reduction in immunization-related errors could be considered.
- Assessment of knowledge retention of health staff at regular intervals can be undertaken.
- Assessment of real-world impact of immunization training interventions on participants practical execution & regularity of immunization adherence should be done.

### References:

- O'Brien KL, et al. Burden of disease caused by Streptococcus pneumoniae in children younger than 5 years: global estimates. The Lancet. 2009 Sep 12;374(9693):893-902.
- McAllister DA, et al. Global, regional, and national estimates of pneumonia morbidity and mortality in children younger than 5 years between 2000 and 2015: a systematic analysis. The Lancet Global Health. 2019 Jan 1;7(1):e47-57.
- PneumoneWS Issue 2. Available at: <https://www.jsi.com/resource/pneumo-news-issue-2/>
- Koshal SS, et al. Critical Factors in the successful expansion of Pneumococcal Conjugate Vaccine in India during the COVID-19 pandemic. Vaccine: X. 2023 Jun 5:100328.