

Evaluation of Intensive Pulse Polio Immunization in the South Gujarat Region of India

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Citation

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Abstract

To evaluate & compare various aspects relating to booth activity and house to house activity during IPPI, present study was done in South Gujarat, India. In urban area 50% and in tribal area 25%, polio booths & teams were interviewed during IPPI in January and February, 2008. Team members at polio booths and parents/guardians of children were interviewed. Variables assessed were immunization coverage of surveyed booths, source of parents/guardians information about IPPI, community member involvement, awareness regarding VVM and its various aspects. Immunization coverage of surveyed booths was 80% in both urban as well as tribal area. Television and anganwadi workers were the main source of information for parents. During house to house activity, few unimmunised children were found. X to P conversion was nil at the end of day. In urban areas, awareness was very poor ($p < 0.01$) for VVM and its various aspects. There is a need for effective training of all booth members regarding various aspects of booth activities and VVM in urban areas and it needs to be sustained in tribal areas.

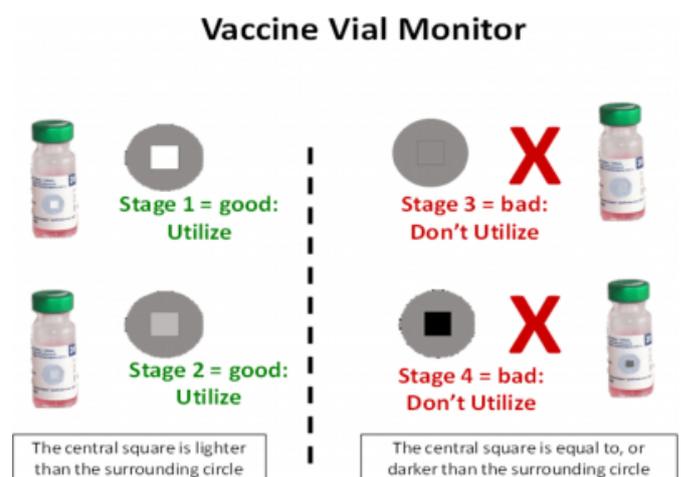
INTRODUCTION

The World Health Assembly passed a resolution in May, 1988 to eradicate polio from earth by 2000 AD. Among countries where polio is endemic, India is the largest country which accounts for more than 50% of polio cases reported globally (1). With this regard, India has started the Intensive Pulse Polio Immunization (IPPI) since 1995. Poliomyelitis is the commonest cause of Acute Flaccid Paralysis (AFP) in India and thus polio eradication is an urgent necessity (2). Available options are provision of safe and wholesome water, proper sanitation (3) & high level of routine immunisation. The impact of routine polio immunisation & IPPI on the incidence of poliomyelitis is well known (4). An important improvement in IPPI during 1998 has been the use of Vaccine Vial Monitor (VVM) (5). This mechanism has been made mandatory in all vaccine procurements since 1998. The VVM is a small square, made up of heat sensitive material placed on an outer grey colored circle printed on the label of the OPV vial. Vaccine Vial Monitor shows color changes on exposure to heat in four stages, (1) stage 1 – where color of small square remains white and color of outer circle remains grey, (2) stage 2 – where color of small square changes to light grey color, (3) stage 3 – where color of small square changes to grey and looks similar like outer grey circle, (4) stage 4 – where color of small square changes to darker grey then outer grey circle. Due to

combined and cumulative effect of time & temperature changes, Vaccine Vial Monitor shows changes in color (figure 1). This helps the booth staff to identify breakdown in maintenance of cold chain and heat exposure of VVM.

Figure 1

Figure 1: Different stages of Vaccine Vial Monitor used for Polio vial



This study was conducted with following objectives to evaluate and compare various aspects relating to booth activity and house to house activity in IPPI programme in urban and rural areas of South Gujarat region, (1) number of children below five years covered for immunization, (2)

number of booth workers attended training for the polio immunization, (3) involvement of community members in each booth ?, (4) participation of booth workers in mobilizing children to the booths, (5) knowledge of booth members regarding Vaccine Vial Monitor, where it is located on vial, correct description of various stages of VVM, how VVM read, (6) source of information of parents/guardians about IPPI, and (7) immunization coverage during house to house survey.

MATERIAL & METHODS

The present study was conducted in urban areas of two districts and tribal areas of two districts of Southern Gujarat in India. Evaluation of two consecutive round/campaign of IPPI in January and February, 2008 was done in these districts. One author has monitored one district for four days of IPPI rounds. In Intensive Pulse Polio Immunization round every year, two National Immunization Days (NIDs), usually in the month of January and February are observed throughout the India for last 10 years. These NIDs include one day of booth activity followed by 3 days of house to house immunization activities. In every round, booth activity day is on Sunday, so that people can come forward to immunize their children below 5 years of age.

For evaluation of IPPI activities, one author has investigated and evaluated one district. Evaluation was done on booth activity day and also on the house to house activity days. For urban areas, 50% booths and 50% teams working for house to house activities were selected randomly for study. In two tribal areas, 25% booths and 25% teams working for house to house activities were covered by authors because of difficult terrain areas in both these districts. Four team members were appointed usually at every booth for conducting immunization. An interview was conducted by using predesigned and pretested questionnaire after getting an informed consent from all those booth members present at booths at the time of visit by authors. Due care was taken while asking questions, and questions were asked when no parent/guardian was present at booth for immunization of children. During interview, questions were asked about VVM, its functions, how to read and interpret it and when can we discard the vial. All the staff members were grouped in four categories, namely A – Auxiliary Nurse Midwife (ANM) / Female Health Worker (FHW) / Anganwadi workers / Accredited Social Health Activists (ASHA) Gram Aarogya Mitra / Pharmacists, B – Nursing students, C – Nagarpalika staff, D – Volunteers.

Assessment of booth activity, interview of booth workers, parents/guardians who brought their children to the booth, to know the source of information about IPPI round, was made. During house to house immunization activities, all those houses found having either an immunized children or no children below 5 years of age were marked as “P” and if house is locked (at time of visit or permanently) or child was not present at the time of visit of health team, house will be marked as “X”. Health team will revisit all the locked “X” marked houses to cover unimmunized child if any, after covering the entire work area given for that day. If any child found unimmunized in “P” marked house, it was termed as missed child and the house considered with “False P” marking. So, P and X marking of houses, X to P conversion at the end of the day, false P marking were also analyzed for both the rounds. Data was entered and analyzed in Epi Info version 3.5.0 by using X2 test for statistical analysis.

RESULTS

The present study was done in urban areas & tribal areas of South Gujarat region of India. Table 1 shows about 80% booth coverage by authors in urban areas and 81% in tribal areas. The number of target children was determined by number of children immunized for polio during previous IPPI round. This number was provided by Chief District Health Officers (CDHOs) of respective districts. Almost all the booths were easily visible with displayed Information, Education & Communication (IEC) material except for little shortage of banners in February, 2008 round. In urban areas, 84.9% and 34.5% booth workers and in tribal areas, 90.9% and 90.5% booth workers attended vaccinator training before the IPPI round. Participation of one community member was about 50% in urban areas whereas; it was more in tribal areas (75-85%). Worst part observed was mobilization of children to booth by booth workers in urban areas (about 60%) which is almost 100% in tribal areas. At any booth, no vaccine vial was found in VVM stage 3 or 4. In any round, complete knowledge regarding VVM was not found in urban areas compared to tribal areas. Trivalent Oral Polio Vaccine (tOPV) was used in both January and February, 2008 round.

Figure 2

Table 1: Observations on the booth activity day during Intensive Pulse Polio Immunization in South Gujarat region in India during 2008

Observations	January, 2008		February, 2008	
	Urban	Tribal	Urban	Tribal
No. of target children	59076	91635	59076	91635
No. of children immunized	47628 (80.6)	74655 (81.5)	47975 (81.2)	74279 (81.1)
No. of booths visited by authors	106 (50)	44 (25)	110 (50)	42 (25)
Two booth workers attended last training	90 (84.9)	40 (90.9)	38 (34.5)	38 (90.5)
One community member present in booth	58 (54.7)	33 (75)	50 (45.5)	36 (85.7)
Health Workers mobilizing children to the booth	62 (58.5)	41 (93.2)	66 (60)	42 (100)
Team having correct knowledge of VVM	87 (82.1)	44 (100)	80 (72.7)	41 (97.6)

Figure in parentheses indicates percentages

Use of mass media particularly television was main source of information regarding pulse polio round in urban areas (71%) while in tribal areas it was about 35% which is comparable (table 2). Anganwadi worker as a source of information was higher (60%) in tribal areas compared to urban areas (18% average), which shows proactiveness of mobilizing children to their booth places. Other sources like radio, newspaper, posters/leaflets, banner/hoardings and relatives/neighbors were not much effective in creating more awareness about pulse polio round and more emphasis should be given to increase parents' awareness.

Figure 3

Table 2: Source of information of parents or guardians about the Intensive Pulse Polio Immunization round in South Gujarat Region in India during 2008

Source of Information	January, 2008		February, 2008	
	Urban (n=185)	Tribal (n=98)	Urban (n=187)	Tribal (n=94)
Microphone announcement	21(11.3)	10 (10.2)	18 (9.6)	03 (3.2)
Television	133 (71.9)	34 (34.7)	133 (71.1)	37 (39.4)
Radio	8 (4.3)	00	7 (3.7)	00
Newspaper	9 (4.9)	00	8 (4.3)	00
Posters/leaflets	16 (8.6)	01 (1.0)	19 (10.2)	04 (4.1)
Banner/hoarding	9 (4.9)	00	6 (3.2)	00
Relatives/neighbors	5 (2.7)	00	15 (8.0)	00
Anganwadi worker	36 (19.5)	56 (57.1)	33 (17.6)	57 (60.6)

Figure in parentheses indicates percentages

At both urban and tribal areas, teams were found in the field

during house to house activity and were immunizing the children but not proactively. During house to house activities, 10 houses marked "P" indicating that house was covered for polio immunization were selected randomly from each team's working area and number of children immunized for polio were noted as per their age (table 3). No vial was found in VVM stage 3 or 4 during this activity. In both the rounds, more number of children was found unimmunized in urban areas as compared to tribal areas of different districts during house to house visits this shows more proactiveness in the tribal areas compared to the urban areas. As tribal areas are also hilly areas, it was difficult for investigators to visit more number of areas and teams compared to the urban areas.

Figure 4

Table 3: Observations by the investigators on house to house activities during pulse polio immunization in South Gujarat region during 2008

Observations during House to House activity	January, 2008		February, 2008	
	Urban	Tribal	Urban	Tribal
No. of teams visited	50	21	51	20
No. of houses visited	500	206	510	203
No. of <2 yrs old child received vaccine	160	104	128	122
No. of <2 yrs old child not received vaccine	08	01	05	01
No. of 2-5 yrs old child received vaccine	212	136	204	145
No. of 2-5 yrs old child not received vaccine	08	01	02	00

Awareness regarding Vaccine Vial Monitor (VVM) was checked among booth members. In urban areas, out of 680 booth members, 528 (77.6%), and in tribal areas out of 254 booth members, 240 (94.5%) had heard of VVM. Of these, majority were from health department & nursing students. Highest awareness about VVM was found in health workers (group A) (89%) in urban areas and 96% in tribal areas, followed by other categories. Statistically significant difference (P<0.01) was observed among health workers and other volunteers in relation to awareness of VVM, knowledge regarding site of VVM on vial, correct description of all four stages of VVM, how to read the VVM and when to discard the vaccine in both urban and tribal areas.

Figure 5

Table 4: Awareness pattern among various staff categories about Vaccine Vial Monitor in urban areas of South Gujarat region in India during 2008

Staff Group*	Heard About VVM	Site/location of VVM On Vial	Correct Description of VVM	Correct Function/How is VVM read	When to discard OPV
A (n=188)	167 (88.8)	156 (83.0)	125 (66.5)	135 (71.8)	133 (70.7)
B (n=248)	218 (87.9)	198 (79.8)	172 (69.3)	187 (75.4)	180 (72.6)
C (n=119)	60 (50.4)	45 (37.8)	12 (10.1)	08 (6.7)	06 (5.0)
D (n=125)	83 (66.4)	63 (50.4)	26 (20.8)	14 (11.2)	10 (8.0)
Total (n=680)	528 (77.6)	462 (67.9)	335 (49.3)	344 (50.6)	329 (48.4)
<i>P<0.01</i>					

Figure in parentheses indicates percentages. The figures in parentheses in the first column are not percentages. *A - ANM/FHW/AWW/ASHA/Gram Mitra/ Pharmacists, B - Nursing students, C - Nagarpalika staff, D - Volunteers/ NGO

These booth members were further interviewed, among them 67.9% booth members in urban and 86.6% in tribal areas were aware that VVM was present on vaccine vial itself. In urban areas only 49.3% and in tribal areas 82.3% could correctly identify VVM as Inner Square with outer circle, while 50.6% booth members in urban and 79.5% in tribal areas were aware of function of VVM. On asking booth members when to discard the vaccine, 48.4% in urban and 80.1% in tribal areas replied correctly. Staff members did not know the fact that they were not allowed to discard any vaccine vial without informing their supervisor.

Figure 6

Table 5: Awareness pattern among various staff categories about Vaccine Vial Monitor in tribal areas of South Gujarat region in India during 2008

Staff Group*	Heard About VVM	Site/location of VVM On Vial	Correct Description of VVM	Correct Function/How is VVM read	When to discard OPV
A (n=129)	124 (96.1)	121 (93.8)	117 (90.7)	115 (89.1)	115 (89.1)
B (n=19)	13 (68.4)	12 (63.2)	11 (57.9)	11 (57.9)	11 (57.9)
D (n=106)	102 (96.2)	87 (82.1)	81 (76.4)	76 (71.7)	75 (70.8)
Total (n=254)	240 (94.5)	220 (86.6)	209 (82.3)	202 (79.5)	201 (80.1)
<i>P<0.01</i>					

Figure in parentheses indicates percentages. The figures in parentheses in the first column are not percentages. *A - ANM/FHW/AWW/ASHA/Gram Mitra/ Pharmacists, B - Nursing students, C - Nagarpalika staff, D - Volunteers/ NGO. No booth member was from Nagarpalika staff - Category C

DISCUSSION

South Gujarat region comprises a mix of urban and tribal areas. This evaluation was done in urban and tribal areas of various districts of this region. Evaluation of two consecutive rounds of pulse polio immunization showed that the booth coverage was still low and it was about 80%, which really needs to be improved. In previous study, the booth coverage reported was also more than 70% in this region (6). Community member is mainly for the mobilization of children from community to the polio booths and they were selected from polio booth coverage area during IPPI round to motivate parents/guardians for polio immunization. There should be at least one community member in all the polio booths, but in urban areas it was about 50%. It shows manpower shortage in form of one community member at each point and is not a good sign.

Poor involvement of the community members, poor mobilization during booth activity in urban areas, seasonal migration of population from tribal areas to urban areas and poor training quality as teams have poor actual knowledge regarding VVM, could be few other possible reasons responsible for poor booth coverage even after easily visible booths with well displayed IEC materials. Similarly, Aggarwal K et al (7) observed that manpower shortage in the form of volunteers from community was responsible for lower coverage at booths. Correct finger marking was not being done in 38% booths as reported by Lal P et al (8) in their study, while in present study, this percentage is

comparatively low (2-12%).

Television and informed with microphone announcement were the main source of information for polio round as reported by Dobe M et al (9) in their study. In present study, Television was the main source of information for pulse polio round. Similar findings were also observed by Chincholikar SV & Prayag RD (10) in their study in rural areas of Maharashtra. But more emphasis should be given on other sources also to spread information regarding IPPI to increase awareness about IPPI. In tribal areas where other mass media sources are weak, involvement of Anganwadi workers shows their proactiveness in their field for both booth activity and house to house activity. More emphasis should be given on maintenance of cold chain system in reorientation training programme of all health functionaries as reported by Galhotra A et al (11) to keep OPV in VVM stage 1 or 2. In present study, VVM in vaccine vials was not found in stage 3 or 4 in any of the four districts of South Gujarat.

During house to house activity, some unimmunised children were found. The reasons were children not at home at the time of visit by health team, parents were not at home, not aware of polio round or they were too busy. Similar findings were observed by Bandyopadhyay S et al (12) in their study at Delhi. A group, from non utilizers of booth services was sure about the fact that the vaccinators will come to their house for polio immunization. Some of these non utilizers forgot about visiting the booths on round day. X to P conversion was found almost nil at the end of the day in both rounds. The reason might be because of large number of houses to be covered by each team per day.

The VVM was introduced for the first time during National Immunization Day in many states of the India including Gujarat (13). In present study, awareness regarding VVM was checked in different districts of South Gujarat region. All the booth members present on National Immunization Days for pulse polio were interviewed and various aspects of VVM were studied. In urban areas, because of manpower shortage on booth activity days, large numbers of volunteers were included. With involvement of volunteers it is necessary to impart good quality training to them regarding maintenance of cold chain and Vaccine Vial Monitor, its various stages and its functions. In tribal areas, as population is scattered and small in number, no extra volunteers are required. Present study shows that still one fourth of booth members in urban areas don't know what VVM is. Chudasama R K

(14) in his study has shown that more than half of the booth members were not aware about the Vaccine Vial Monitor. Similar findings were observed by A Puri et al (15) in their study of awareness of oral polio VVM among polio booth staff in New Delhi. In tribal areas, more than 90% booth members have heard about VVM which was a good sign. There was one day training for staff of IPPI 4-5 days before each round regarding what they have to do during booth activity, how to do finger marking, how to mobilize children from community, knowledge about VVM, its stages, how to read it. More emphasis should be given on good quality training to all the participants including volunteers and health staff for booth activity and house to house activity. All aspects of Vaccine Vial Monitor like, what is VVM, where it is located on vials, which are the stages of VVM, how it can be read, and when it can be discarded should be covered during the training. A good trainer is also necessary to impart such valuable things to the staff of IPPI.

When various other aspects of VVM were asked to booth members who have heard of VVM like, how it functions, how it can be read and when vaccine vial should be discarded, awareness was very poor both in urban and in tribal areas. Thakur JS et al (16) and Chudasama RK (14) observed similar findings in their studies. Joshi K et al (17) in their study has shown that knowledge regarding VVM and its various aspects among health personnel was also poor. It was a common feature that a good number of booths were run exclusively by nagarpalika staff and volunteers (group C & D) in urban areas. In absence of trained health workers, it becomes necessary for volunteers to look after vaccines. Hence not having knowledge about VVM can badly affect the IPPI.

CONCLUSION

Present study shows deficits in programme implementation even after many years of campaigning and provides extents to which strengthening is needed, especially in urban areas. There is a need for effective training of all booth members regarding how polio immunization can be done, mobilization of children to polio booths, VVM and its functions in urban areas where volunteers and nagarpalika staff are included for booth activity. In this study, tribal areas have better immunization activities for pulse polio than urban areas because of active involvement of community members including anganwadi workers who works at the village level for welfare of mother and children below 5 years of age.

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