ORIGINAL ARTICLE

ASSESSMENT OF ROUTINE IMMUNIZATION PROGRAM AT PRIMARY HEALTH CENTRE LEVEL IN JAMNAGAR DISTRICT

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ABSTRACT

Background: PHC is a key place for implementing routine immunization program and storing of vaccines. Present study conducted to assess various components of routine immunization program at PHC level. This study also identifies key strengths, weaknesses, opportunities and threats at PHC level for implementing Routine Immunization Program.

Materials and Methods: A cross-sectional facility based study was conducted in Jamnagar district from March 2010 to March 2012. Total two Primary Health Centers were randomly selected from each 07 block offices in Jamnagar District. So, total 14 PHCs were included in the study representing 40% of total PHCs in the district. Data were collected by structured Routine Immunization check list for PHC/CHC developed by WHO/Government of India.

Results: 78.57% PHCs did not prepare Dropout chart. 42.86% of PHCs did not have their map. Frost > 5mm seen in 78.57% of PHCs. DF temperature did not between -15 to -25'C in 28.57% PHCs. Voltage stabilizer was not functional in 14.29% PHCs. Temperature Log book was not properly maintained in more than half of PHCs. 35.71% PHCs suffer of shortage of one or more vaccines. Data discrepancy of stock was observed in 57.14%. No AEFI reported in all PHCs in the previous 03 months. Supervision found to poor in majority of PHCs.

Conclusions: Various issues regarding immunization program at PHC level like planning, cold chain maintenance, vaccine stocks, supervision etc. should be properly addressed for improving the quality of immunization services in the district.

Key Words: Routine Immunization, Process Evaluation, Monitoring

Abbreviations
PHC = Primary Health Center
CHC = Community Health Center
DF= Deep Freezer
WHO=World Health Organization
AEFI= Adverse Events Following Immunization

INTRODUCTION

Immunization has been one of the most significant, cost-effective and stimulatory public health interventions. About one-quarter, or 25%, of under-5 mortality is due to vaccine-preventable diseases.[1] The World Health Organization (WHO) launched the Expanded Program on Immunization (EPI) in 1974 globally with focus on prevention of the six childhood vaccine-preventable diseases by the year 2000.[2] Immunization Program in India was introduced in 1978 as Expanded Program of Immunization. This gained momentum in 1985 as Universal Immunization Program (UIP) and implemented in phased manner to cover all districts in the country by 1989-90.[3] Further, a national socio-demographic goal was set up in National Population Policy (NPP) 2000 - to achieve universal immunization of children against all vaccine-preventable diseases by 2010.[4]

In spite of lots of effort by government and other health agencies, approximately 10 million children and infants in India remain unimmunized which is highest number of such children in the world.[5] While Full immunization coverage rate was 54.8% (all doses up to age of one year) in Gujarat and 56.4% in Jamnagar District according to DLHS 3 survey (2007-08).[6]

It was realized that merely providing vaccine just to achieve targets without giving adequate attention to quality of immunization services doesn't guarantee a reduction in disease morbidity & mortality. Primary Health Centre (PHC) is a key place for implementing routine immunization program and storing of vaccines. For successful implementation of routine immunization service all its components – planning of immunization sessions, cold-chain and logistics management, Reports, Supervision etc. should be carefully looked into. This requires an evaluation. The present study was conducted with an objective to evaluate the process of

routine immunization at PHC level in Jamnagar district, Gujarat with specially focus on quality of services. This study also identifies key strengths, weaknesses, opportunities and threats at PHC level for implementing Routine Immunization Program. It provides opportunity to improve the quality of service delivery at PHC level and for better management of routine immunization program.

MATERIALS AND METHODS:

An immunization program based evaluation study at PHC level was conducted in Jamnagar district of Gujarat from March 2010 to March 2012. Author of the study worked as Routine Immunization Monitor and study was conducted along with monitoring. The Jamnagar district has total 07 Block Health Offices. It was decided to select 02 PHCs from each Block Health Offices randomly. Thus total 14 PHCs were included in the study out of total 35 PHCs in the district representing 40% of PHCs in the district. PHCs were visited on Wednesday (Fixed Immunization day). The data was collected on structured pretested questionnaire, which was prepared by WHO/Government of India and modified as per requirement of study.[5] The questionnaire consists of interview and observations of various aspects like program management, cold chain management, injection safety, quality of record keeping, supply and stock etc. All the data collected was then coded and analyzed using Microsoft Excel. Statistical analysis was done by proportion.

RESULTS

Program management and cold chain aspects at Primary Health Centre were depicted in Table – 1 and Table – 2 respectively. It was good regarding program management that all PHCs prepared session plan while Many issues were founded regarding program management like 78.57% PHCs did not prepared Drop Out chart, joint review meeting not held in half of PHCs etc.

Table 1: Program management at Primary Health Center level

Program Management Aspects	No. (n=14) (%)
Availability of map of catchment area	8 (57.14)
estimation of beneficiaries	10 (71.43)
estimation of logistics	8 (57.14)
Availability of Session plan	14 (100)
Availability of Supervision plan	10 (71.43)
Availability of Drop out chart	3 (21.43)
Joint review meeting conducted in last calendar month	7 (50)

Some serious issues were also observed regarding cold chain at PHC level like Deep Freezer (DF) temperature was not between -15 to -25'C (28.57%), tOPV were founded inside DF (14.29%), frost more than 5mm in DF (78.57%), other than vaccines inside Ice Lined Refrigerator (ILR) was found in 01 PHC etc. There were some issues regarding proper placement of vaccines inside ILR and ice packs inside DF, proper maintenance of Cold chain log book etc. also founded during the visit.

Table 2: Cold chain findings at Primary Health Center level

Cold chain Aspects	No. (n=14) (%)
ILR/DF placed on wooden blocks	12 (85.71)
ILR/DF 10cm away from wall	14 (100)
Connected through functional voltage stabilizer	12 (85.71)
Functional thermometer inside ILR	14 (100)
Functional thermometer inside DF	14 (100)
< 5 mm frost inside ILR	14 (100)
< 5 mm frost inside DF	3 (21.43)
Twice daily recording of temperature in log book	14 (100)
Record of Power failure	7 (50)
Record of defrosting	8 (57.14)
Signature of MO in temperature log book	9 (64.28)
ILR Temperature between +2 to +8'C	14 (100)
All vaccine vials placed correctly arranged inside ILR	12 (85.71)
All vaccine vials placed inside labeled cartons	11 (78.57)
Other then vaccines inside ILR	1 (7.14)
No T series and Hepatitis B vials placed at the bottom of ILR	13 (92.86)
Diluents placed inside ILR at least 24 hours before distribution	12 (85.71)
DF Temperature -15 to -25'C	10 (71.43)
Correct placement of Ice packs inside DF	3 (21.43)
No RI vaccine stored inside DF	12 (85.71)

ILR-Ice Lined Refrigerator; DF-Deep Freezer; MO-Medical Officer; RI-Routine Immunization

Table – 3 depicts supply and stocks, details regarding immunization sessions and Bio Medical Waste management at PHC level. 35.71% did not have all vaccines in adequate quantity. Besides this, issues regarding updating and maintenance of stock register were also observed in some PHCs. 97.85% sessions held as planned in the previous month of visit in studied PHCs and no PHC had less than 80% in this regard. Average Dropout rate was 4.33%. 05 out of 14 PHCs had nil Dropout rate while 03 PHCs had Dropout rate more than 10%.There was nil serious Adverse Events Following Immunization (AEFI) report in all PHCs in the previous 03 months of visit. While 01 PHC reported one case of measles in the previous 03 months of visit. There were issues regarding Bio Medical Waste management also observed in 28.57% of PHCs.

Table – 4 depicts supervision of routine immunization program at PHC level. Filled supervisory forms did not observe in the 78.57% PHCs during visit. Sessions supervision by ICDS Supervisor was found to be poor. It was also founded that 28.57% PHCs did not prepare their session supervision plan. Supervisory visit by

District level Government Health Officials in previous month of visit was not observed in 64.29% PHCs.

Table 3: Stock, Immunization Sessions and BioMedical Wastes at PHC level

Routine Immunization Program Components	No. (n=14) (%)
Supplies and stock	
All vaccines available at adequate quantity	9 (64.29)
Stock register updated	9 (64.29)
data discrepancy observed in stock	8 (57.14)
All vaccines issued for each session from PHC	8 (57.14)
Record of AD syringes updated	7 (50.00)
Record of diluents updated	7 (50.00)
Immunization Sessions	
> 80% of Immunization session held as planned in last month	14 (100)
Drop out rate >10% for DPT of last 03 months	3 (21.43)
Bio Medical Wastes	
Immunization waste chemically disinfected	10 (71.43)
Disposal pit used only for disposal of sharp wastes	10 (71.43)

PHC-Primary Health Center; AD= Auto Disabled; DPT= Diptheria, Pertusis Tetanus

Table 4: Supervision at PHC level

Supervision Aspects	No. (n=14) (%)
Filled Supervisory forms at PHCs	3 (21.43)
Supervision by FHS	11 (78.57)
Supervision by MS	2 (14.29)
Supervisory visit conducted by Govt. health officials in last calender month	5 (35.71)

PHC= Primary Health Centers FHS= Female Health Supervisors, MS= Mukhaya Sevika

DISCUSSION

Planning is a continuous process of analyzing data, evaluating progress and constraints and making decisions about reaching program objectives. It was observed in the present study that Session plan was prepared at all PHCs but other important matters which was helpful for better planning of immunization services like map of catchment area, estimation of logistics and beneficiaries, Drop out chart etc. were not prepared in many PHCs. This may be due to weak supervision from Block and District level and lack of efforts at PHC level. NIHFW study in various states of India in 2009 observed poor results regarding planning as compared to present study i.e. map of catchment area was not available in 61% of PHCs as compared to 42.86% in present study, Only 4% PHCs displayed coverage monitoring charts as compared to 21.4% in the present study and Estimation of number of beneficiaries was not done in 39% of PHCs as compared to 28.57% in the present study.[7] Joint review meeting was not conducted in the half of PHCs in the present study. This may be due to lack of co ordination between health and ICDS Department. These issues also signal scope of better planning for provision of immunization services to the community in the Jamnagar district.

Cold chain component was also assessed at PHC level in the present study. Temperature of ILR between +2 to +8'C observed in all visited PHCs. Tushar Patel, Devang Rawal and Niraj Pandit in Anand district, Gujarat in 2008 observed 90.9% PHCs had appropriate ILR temperature which was slightly lower than present study.[8] In some PHCs, vaccines were not placed properly inside ILR and diluents were not placed inside ILR before 24 hours of distribution in the present study. It was observed that 85.71% PHCs stored vaccines properly inside ILR. Contrary to this findings, Tushar Patel, Devang Rawal and Niraj Pandit in Anand district, Gujarat in 2008 and Geetu Singh et al in Sitapur district of Uttar Pradesh in 2013 observed storage of vaccines in ILR was adequate in 93.2% and 95% PHCs respectively.[8,9] This may be due to regional variation and survey technique. Besides this, it was observed in the present study that Temperature of DF was not between -15 to -25'C in 28.57% of PHCs which was related with frost > 5 mm and improper placement of ice packs in many PHCs. t OPV was observed inside DF in some PHCs. These all issues signal lack of efficiency of cold chain handler and lack of supervision. This may be due to no full time cold chain handler was available in some PHCs. Cold chain handler have additional charge of 01 or 02 PHCs in some block. It also signals need of training regarding cold chain.

Some good findings like functional ILR and DF, Functional thermometer inside ILR and DF, site of ILR/DF etc. were observed in all PHCs. While Geetu Singh et al in Sitapur district of Uttar Pradesh in 2013 observed that sickness rate of ILR was 12%.[9] NIHFW study in various states of India in 2009 observed functional DFs were available at 80%; ILRs at 78%; thermometers at 91% and voltage stabilizers at 82% of PHCs.[7] Some issues like ILR/DF not placing on the wooden blocks, not connected with functional voltage stabilizer etc. were observed in 14.29% PHCs in the present study. Geetu Singh et al in Sitapur district of Uttar Pradesh in 2013 observed 8% did not have functional stabilizer.[9] Temperature log book was also not properly maintained in some PHCs in present study i.e. record of defrosting was not available in 42.86% of PHCs which was similar to Geetu Singh et al in Sitapur district of Uttar Pradesh in 2013 who observed record of defrosting was not available in 40%.[9] Some information like record of power failure, signature of MO etc. was also not found in the temperature log book. NIHFW study in various states of India in 2009 observed that 36% of PHCs were not correctly maintaining the temperature log books.[7] These issue indicate not only less seriousness of cold chain handler but also weak supervision in the PHC.

It was observed in the present study that 64.29% of PHCs had adequate quantity of vaccines. This may be due to short supply of BCG and t OPV in the district during study period. Inadequate stock of BCG may be due to higher wastage of BCG in the district as FHW

opened BCG vial even for one beneficiary. Similar finding was observed by NIHFW study in various states of India in 2009 in which Stock-outs or shortage of vaccines or syringes in last 3 months were reported by 37% of PHCs covering all the states.[7] Some states reported Stock-outs or shortage higher than present study i.e. Uttarakhand (83.3%), Jharkhand (60%) and Orissa (50%) while some states reported Stock out or shortage less as compared to present study like Bihar (16.7%), Rajasthan (20%) and Madhya Pradesh (25%).[7] While Rashmi Kundapur et al in 2011 in Davangere taluk in South India observed 87.5% of health facility had vaccine sufficiency in the last month.[10] Issues regarding maintaining records of vaccine stock, diluents and Auto Disabled syringes were also observed in many PHCs in the present study. 64.29% of PHCs were correctly maintaining the stock register which was lower as compared to NIHFW study in 2009 in various states of India (73%).[7] It was also observed in the present study that all vaccines were not issued in 57.14% PHCs for each session. These all issues signal lack of care by responsible persons regarding stock maintenance and record keeping.

In the present study more than 80% of sessions held as planned in all PHCs (100%) during last month of visit. While Tushar Patel, Devang Rawal and Niraj Pandit observed more than 80% sessions held as planned in 89.6% PHCs in Anand district, Gujarat in 2008. This low level in Anand district may be due to various reasons like vacant post, FHW on leave or in training etc.[8] In the present study, high Drop Out rate (>10%) for DPT of last 03 months of visit had been founded in 21.43% of PHCs which was higher than Tushar Patel, Devang Rawal and Niraj Pandit in Anand district, Gujarat in 2008 (6.8%).[8] This indicates poor tracking of children in respective PHCs of Jamnagar district. Regular monitoring of AEFI is an important tool regarding quality of immunization program. It was observed in the present study that any kind of AEFI was not reported in all studied PHCs since last 03 months of visit. This might be due to either mild AEFI goes unrecognized and did not reported by parents or reporting of AEFI is poor by service provider. Similar findings was also observed in various states of India like Bihar, Jharkhand, Rajasthan and Uttarakhand in the study by NIHFW in 2009.[7] Vaccine Preventable Disease (VPD) surveillance is also important tool regarding effectiveness of immunization program. Only 7.14% PHC reported VPD in last 03 months of visit in the present study which was similar to Uttar Pradesh in the study by NIHFW in 2009 (8.3%).[7] While other states like Bihar (25%), Jharkhand (30%), Orissa (37.5%) etc. in the NIHFW study in 2009 showed higher rate of reporting of VPD in last 03 months as compared to present study.[7] This difference might be due to some factors like regional variation of occurrence of VPD cases, immunization coverage etc. It was observed that disposal pit was used only for disposal of sharp wastes and immunization wastes chemically disinfected in 71.43% of PHCs in the present study. While NIHFW study in 2009 in various states of India observed disposal pits were used in 54% of PHCs and immunization wastes chemically disinfected in 30% of PHCs which was lower than present study.[7] State wise variation seen regarding disposal pit used only for sharp wastes in NIHFW study in 2009 like Uttrakhand (33.3%), Jharkhand (40%), Rajasthan (40%), Uttar Pradesh (45.8%), Orissa (62.5%) and Bihar (91.7%).[7]

It was found in the present study that though the supervision plan was available in many PHCs but supervision is poor in the district. Plan for supervision was available in 71.43% of PHCs in the present study. While Tushar Patel, Devang Rawal and Niraj Pandit in Anand district, Gujarat in 2008 observed plan for supervision in only 6.8% of the PHCs.[8] Filled forms of supervision did not found in 78.57% of PHCs in the present study as compared to NIHFW study in 2009 where no records to support the supervisory visits were available in 45% of the PHCs and Supervisory checklists/reports were available only at 27% of the PHCs.[7]

CONCLUSION

The present study highlights certain issues in every component of routine immunization program at PHC level in the district. Issues regarding planning like Drop out chart, map, estimation of beneficiaries and logistics, organization of joint review meeting etc. found in the district signal lack of efforts at PHC level. Cold chain issues like maintenance of DF temperature, defrosting, temperature log book maintenance etc. and maintenance of vaccine stock indicate lack of efficiency of cold chain handler and need of their training in some PHCs. Other issues like poor AEFI reporting, poor tracking of children in some PHCs, improper waste management and poor supervision especially by ICDS supervisors had also been found in the district.

RECOMMENDATIONS

Observation from the present study points towards pressing the need to accelerate efforts at all levels in the study area regarding better planning, proper cold chain maintenance, maintenance of vaccine stocks, updating records, improving AEFI and VPD reporting, proper management of BMW and strengthening supervision for better provision of quality immunization services. Sample size during assessment should be increased to reduce the errors and to get a confidence result.

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