

# Quality Assessment of Immunization Programme for Children Under Five in Davangere Taluk of South India

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## ABSTRACT

**Background:** Although immunization coverage has increased in recent times in India, the quality of the Indian national immunization programme is still debatable. So, this study was conducted to assess the quality of documentation of immunization and health education to mother during Expanded Programme on Immunization (EPI) which is the national immunization programme of India and stresses on childhood Immunization against diseases of public health importance. The quality of maintenance of cold chain was also assessed in the study along with other factors.

**Method:** This cross sectional study involved female Junior Health Worker (JHW) of Davangere taluk in South India as participants. These were selected based on lot quality assurance sampling (LQAS). Each Junior Health worker Female (initially called

multipurpose workers) who did immunization was considered as 1 lot. The numbers of lots rejected were considered for analysis and if rejection was higher than the allowed defect (obtained from LQAS table) the quality was considered poor.

**Results:** Identification of needed vaccine by the JHW was poor as determined by LQAS technique. Vaccination status of children and vaccine recommendation for sick children was poor. Care of vaccine was good except for contamination during loading. Vaccination technique practiced by female JHW of Davangere taluk was poor. EPI education given to mother had failed in many places by LQAS. Maintenance of cold chain and supply of vaccine was good. Knowledge about immunization process among service providers was 100% about all vaccine.

**Conclusion:** The quality of immunization sessions were not up to the mark.

**Key Words:** Quality assessment, Immunization, under five years, Primary health care

## INTRODUCTION

The Universal Immunization Programme was started in India in 1985, with an efficient coverage as one of its vital objectives. In a large country like India, the coverage and quality is area specific. Also, there are various reasons for the quality of the immunization and the immunization failure in India [1].

The quality of health care has been defined (WHO 1988) as "Proper performance (according to standards) of interventions that we know to be safe, that are affordable to the society and that have the ability to produce an impact on the mortality, morbidity, disability and malnutrition in humans"[2].

Quality assessment is important to determine whether the primary health care service is provided according to the established norms. Although the immunization coverage has increased, the quality of the immunization programme is still questionable. The Lot Quality Assurance Sampling (LQAS) is a sampling method in which a "lot" is the sampling unit. One lot may have more observations, but the sampling units are used to assess the quality of the service and the immunization coverage. LQAS methods have been adapted in various settings from industries to primary health care, for which only a small sample size is required. The methods can differentiate between whether or not the performance targets have been met [2].

So, this study was conducted to assess the quality of the documentation of immunization and health education to the mother during the Expanded Programme on Immunization (EPI). The

quality of the maintenance of the cold chain (the process which maintains the potency of the vaccine under the required temperature from the manufacturing unit to the area where the immunization is conducted) was also assessed.

## MATERIALS AND METHODS

This cross sectional study, after getting its approval from the ethics committee of J.J.M. Medical College, was conducted on the female junior health workers (JHWs) who were selected by using LQAS, from the Davangere Taluk of south India, which was similar to any low to medium literate and developed taluk of the country. LQAS is a sampling technique in which the sampling unit is called a 'lot'. We used the service provider as a single lot. This technique needs a predetermined maximum and a minimum level to select the sample size. The authors set 90% as the maximum and 65% as the minimum predestined level for the quality. By considering the above maximum and minimum percentages (the percentages were arbitrarily chosen, considering the overall state coverage range) and by using the LQAS table3, the sample size was determined to be 16 lots. The lots sample size was determined by using the lots table on the predetermined maximum and minimum quality requirements. As there was one female JHW at every centre, 16 female JHWs from 16 centres were selected by using random numbers. The acceptable sample size was 13 and the allowed defect was 3 according to the LQAS table.

To reduce the observational variance, a single observer who was unfamiliar and an external candidate were used, who visited all the 16 centres without any prior intimation. To decrease the bias

which could occur due to a single observation (as this observation could be a wrong information on the activity of the health worker), at least 10 observations of the immunization (one observation was one child being immunized by one female JHW in a single immunization session of the centre) were made for one sample unit. The quality was considered as acceptable if 9 out of 10 observations were absolutely right in each lot.<sup>2,4</sup> According to the rapid assessment checklist (Agha Khan Foundation)<sup>5</sup>, the questions were framed to focus on the service delivery by the service provider, the quality of the vaccines which were used (cold chain maintenance) and the EPI education which was given to the mother.<sup>3</sup> For the EPI education, the questions were also assessed for their priority for e.g: The issue of the next vaccination session was given higher priority and the responsibility of the attending mothers in educating other mothers about the vaccination was given lower priority.

The identification of the needed vaccine included reviewing the health card and other health related data of the child, vaccination of the minor ill child and knowing the vaccination status of other children who were at home.

## STATISTICAL ANALYSIS

If the number of lots which were rejected were higher than the allowed defect, their quality was considered as poor and the lots were considered as failed. On the other hand, if the number of rejected lots were within the allowed defect, their quality was considered as good and the lots were passed as per the LQAS guidelines. The percentage was calculated by using 160 (i.e. 10 x 16) samples as a denominator with 10 observations and 16 lots.

## RESULTS

We reviewed 16 JHWs in the Davangere Taluk, from which we found that the identification of the needed vaccine was poor (Table 1). Almost all the immunization cards which were given to the mothers in the earlier sessions of the immunization were reviewed. But the enquiry on the vaccination status of other children in the house was poor (> 3 defect = fail). The vaccine recommendation

Question	Number Of Positive Lot / Total Lot	Remarks	Percentage
Review of health records	15/16	Pass	94%
Vaccination status of other children at home	7/16	Fail	43.75%
Vaccine recommended even to a sick child	10/16	Fail	62.5%

[Table/Fig-1]: Identification of needed vaccine

Question	Number of Positive Lot / Total Lot	Remarks	Percentage
Preparing area for injection	11/16	Fail	68.25%
Use of sterile needle	16/16	Pass	100%
Use of sterile syringe	9/16	Fail	56.25%
Vaccination at right place/level	16/16	Pass	100%
Vaccination of all vaccines needed that day	11/16	Fail	68.25%
Disposal of needle & syringe	4/16	Fail	25%
TT for mothers	16/16	Pass	100%

[Table/Fig-2]: Vaccination technique

Question	Number of Positive Lot / Total Lot	Remarks	Percentage
Explain mother about vaccination	11/16	Fail	68.75%
Side effects informed	12/16	Fail	75%
Tell mother where to go for severe reactions	13/16	Pass	81.25%
Importance of completion of vaccination	9/16	Fail	56.25%
For 3 <sup>rd</sup> dose DPT stress on Measles	13/16	Pass	81.25%
Immunization of ill child awareness	11/16	Fail	68.75%
Tell about next immunization	16/16	Pass	100%
Mothers to encourage other women for child's vaccination	8/16	Fail	50%
Verify about mothers understanding of key message	11/16	Fail	68.75%

[Table/Fig-3]: Education of mothers about Expanded Programme of Immunization

Question	Number f Positive Lot / Total Lot	Remarks	Percentage
Working refrigerator	16/16	Pass	100%
Cold chain monitor	16/16	Pass	100%
Temperature log	16/16	Pass	100%
Temperature recorded regularly on local schedule	11/16	Fail	68.75%
Registered 0-8°C at all times previous month	10/16	Fail	68.25%
Vaccine sufficiency in last month	14/16	Pass	87.5%

[Table/Fig-4]: Maintenance of Cold chain and Supply

Question	Number of Positive Lot / Total Lot	Remarks	Percentage
Age of BCG vaccination	16/16	Pass	100%
Age of DPT vaccination	16/16	Pass	100%
Age of MEASLES vaccination	16/16	Pass	100%
Age of OPV vaccination	16/16	Pass	100%
Vaccination of ill child	13/16	Pass	81.25%

[Table/Fig-5]: Results of interview with service provider

for a sick child (a child with any illness who came to the health centre for treatment) was poor (> 3 defect= fail). (Only 9% of the sick children were vaccinated by the health workers)

The overall care of the vaccine was of good quality according to the LQAS, as the Vaccine Vial Monitor (VVM) check, the correct label check and the ice coverage during the session were adequate. The loading of the vaccine without contamination (We considered it as a contamination when either the needle or the syringe weren't changed for a new child's vaccination.) was poor (> 3 had failed to do so). 100% of them maintained a cold chain at the level of the

vaccine delivery. 81.25% of the female JHWs checked the VVM and the label, but only 68% of them loaded the vaccine without contamination [Table/Fig 2]. [Table/ Fig 3] gives information about the EPI education in which the importance of completing the vaccine, encouraging the mothers to educate others in society, explaining the side effects to the mothers and verifying whether the message reached the mothers failed according to the LQAS (>3 defect) [Table/Fig 3]. But the stress on the measles vaccination at 9 months and the education on the next vaccination session for the child was good [Table/Fig 3]. 100% of the service providers gave information about the next vaccination session and 81% stressed on the measles vaccination. 75% explained the side effects, 56% gave information on the completion of the immunization and 69% verified the mother's knowledge. Also, 50% encouraged the mother to educate others.

The documentation was good. This was concluded after checking the health workers records and the repeat vaccinations on the child's card. We could see that 87.5% of the health workers had done it perfectly right, whereas the rest had not recorded the vaccination on the child's card. When the mothers/care takers were interviewed at the exit, 100% of them correctly recalled the days of the vaccination and of the next return for the immunization, but they were not clear of the side effects and they lacked motivation for enhancing the programme by the next visit and to get other children in their neighbourhood for the vaccination.

The maintenance of a cold chain and the supply was good [Table/ Fig 4]. The refrigerators were working, there was a temperature log and the cold chain monitor and the vaccine sufficiency was good. The female JHW failed to record the temperature regularly during her local schedule (>3 defect).

The knowledge of the workers was very good, as was assessed by a direct interview with key questions after the immunization session and also the supply was prompt and adequate. Despite the 100% knowledge of the service providers [Table/Fig 5], the proper identification of the needed vaccine and some vaccination techniques failed [Table/Fig 1 & 2].

## DISCUSSION

This study revealed the poor quality in the identification (the health workers did not pay attention to the card review for the status of other vaccinations and to the status of the vaccination of other children in the same house) and in the vaccination of sick children, as was seen in earlier studies too, [6,7].

In an earlier study, 32% people were unaware of the need for a vaccine, which was identical to that which was seen in our study [6]. In a study which was conducted by the National Health and Family Welfare, only 18% sick children were vaccinated, while in our study, relatively more sick children were vaccinated. The use of a sterile syringe failed, which was seen even in earlier studies, as only 50% of the health workers used sterile syringes [6]. This is not be a problem today and it will not be in the future also, as there is supply of auto disposable syringes and needles for vaccination now-a-days.

The NHFS (National Health and family Survey which was conducted by government of India) and a study on the review of the immunization programme said that 33% had a fear of side effects, which is similar to that which was seen in our study. The NHFS study [6] also stated that 32% of the parents/guardians did

not bring the children because they were ill. But the EPI education on immunization was good in our study and it was poor in the earlier studies [6,7]. It was very evident that none of the service providers had concentrated much on the EPI education though it seemed that the status was much better than in earlier studies, nor on the quality of the service, as everyone carried out the service as a part of their work. In an earlier study [8], the mothers did not know how many vaccinations their children had to receive or by what age they had to complete them, which was much improved in our study population.

The JHW(F) had been on improvement as compared to earlier reports [6,7]. The poor performance in the quality was also dependent on the workload of the JHWs(F). Each worker had to vaccinate around 25-30 children in 2-3 hours. The knowledge of the workers was very good and also the supply was prompt and adequate, which could improve the quality in future.

In our study, as the service provider was observed and as there was an evident presence of someone during the service provision, so the quality might have been spuriously improved, which was a limitation of our study. Similarly, the mothers' knowledge during their exit interview may have been high, as they were interviewed within a short span of time and also within the campus of the service provider. But the strength of this study was that it was one of the studies which concentrated not on the estimate of the coverage, but on the quality of the service in immunization. This study concentrated on the EPI education of the mothers and also on the mothers' knowledge on vaccination. It was also a study on the quality of the service, which was done by using the LQAS method. In addition, the LQAS method gives only a rough estimate; therefore, further studies are needed to confirm our findings.

## CONCLUSION

Overall, the quality of the service was not bad, but there existed some areas which needed more attention, such as contaminated loading, unsterile syringes, and a deficient knowledge on the EPI education. The health workers failed to keep up their standards in these works.

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