

Evaluation of Implementation status of immunization program in Wukro town, Eastern Tigray, North Ethiopia, Cross- sectional study 2016

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Abstract:**Background**

Expanded Program on Immunization (EPI) in Ethiopia was launched in 1980. Routine EPI reports have shown high dropout rate, high antigen wastage and low TT dose coverage in Tigray region and Wukro town. Therefore, aim of this study was to Evaluation the Implementation status of immunization program in Wukro town, Eastern Tigray, North Ethiopia

Method and Materials

Mixed A community-based cross-sectional study designs methods were employed in Wukro town. Multi-stage sampling technique was used to select 248 mothers who have less than 24 months aged children and 192 pregnant mothers. All quantitative data cleaned, edited and entered into SPSS software version 20 for analysis by principal evaluator.

For qualitative data, 50 clients who came to health center for the vaccination service observed and Sampled 12 documents of last 24 months reviewed and resource inventoried. Observation/inspection and document review was analyzed manually using thematic and content analysis and results are presented in narrative form. Finally, data from different sources triangulated to produce valid information. The program components are judged based on the set criteria of the judgment matrix analysis to declare the implementation status of immunization program. Five (excellent, very good, good, low and very low) Criteria are well implemented.

Result

The study participants reported that immunization program is solving a common health problem in the area. All the health institutions are secured the necessary resources. It was noted that



immunization service accessibility and Client satisfaction was 100% (34.8% good, 19.3% better and 45.9% were excellent). Plan verse achievement confirmed that penta3, measles and full immunization coverage was 98.3%, 90.3 and 90.3 which is very important and good. Qualitative study showed that there is harmonized reporting schedule from HEWs up to regional health bureau and using standard report format complete and 95% accurate data reports were arrived on time through email and hard copies.

Conclusion

Comparing the study results with the evaluation judgment criteria the availability, acceptability, compliance and data quality dimensions are good. In general, the overall achievement of the immunization program in the town is good.

Keywords: Evaluation, Implementation status, Immunization program, cross-sectional study,



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1. Introduction

The Expanded Program on Immunization (EPI) was established by the World Health Organization in 1974 to control vaccine preventable diseases and in Ethiopia was launched in 1980. It offers the greatest benefits for health, wellbeing and survival of children (1).

Worldwide about 29,000 children under the age of five die every day, mainly from preventable causes. An Ethiopian child is 30 times more likely to die by his or her fifth birthday than a child in Western Europe [2]. Some of the deaths occur from illnesses like measles, Tuberculosis or tetanus. Epidemiological investigations of recent outbreaks of vaccine preventable diseases indicated that incomplete immunization was the major reason for the outbreaks. Moreover, a low immunization rate was the major reasons for many of the outbreaks of infectious diseases [3].

The coverage of immunization showed decrement from the initial doses of vaccine to the last doses. Based on the information extracted from vaccination card, only 25.7% children completed all the recommended doses of vaccines. Ethiopia Demographic Health Survey 2011 showed coverage level for DPT-3 and the percentage of fully immunized children are reportedly 36.5% and 24.3% respectively (12).

In Oromia region DPT-3 and full immunization coverage were 26.8% and 15.6% respectively. According to EDHS-2011, DPT-3 coverage in many of the regions was below 80%, the lowest being in Afar region 9%, the highest in Tigray 73.4% and in Oromia 26.8% [12]. Despite the high prevalence of VPDs in the country, immunization coverage rates stagnated and remained very low for many years (12).



The major hindering factors from achieving universal immunization include: low access to services, low number of trained manpower, high staff turnover, lack of fund donors, lack of information, lack of transportation, distance from health facilities, inadequate awareness of mothers/caregivers, others such as missed opportunities, and high dropout rates especially through routine approaches [13]

In order to increase child immunization coverage, the underlying causes and parents' reasons not to immunize their children and Implementation status of immunization program should be known. In the study area, so far no community based immunization coverage and Implementation status of immunization program assessment study was conducted. Therefore, this study will try to fill these gaps by evaluating the implementation status of immunization program in Tigray region, Ethiopia. It will also help program implementers and service providers to eliminate the obstacles and improve child immunization coverage in order to attain the intended prevention and control of VPDs. It also helps as a baseline for future studies.

2. Methods and Materials

2.1. Study design, setting and participants

Mixed A community based cross sectional study design was conducted at Wukro town which is located at eastern Tigray region from January to March 2016. For quantitative pregnant and non-pregnant mothers who had under two year's old children and for quantitative registration books, documents and reports were study participants.

2.2. Sampling technique and procedure



All of the three Kebeles found in Wukro town was taken by this evaluation. The respondents selected by proportional allocation, Kth interval and primarily respondent found in each Kebele was listed in a sampling frame, then after to get the first respondent simple random sampling (simple lottery system) technique was applied.

2.3. Data collection instrument and quality management

Questionnaire, checklists and interview guides were prepared from WHO Measure evaluation survey tool and with agreement of stakeholders (Wukro health office). Both qualitative and quantitative methods used to collect the necessary information. For record review and observations of immunization in the households and documents Guided check list has been used.

The data collectors were trained for one day and One-week prior to the actual data collection period pretest was conducted. During data collection time, a close supervision, honest communication and on spot decisions was conducted during data collection.

2.4. Statistical analyses

All quantitative data cleaned, edited and entered into SPSS software version 20 for analysis by principal evaluator. Data was cleaned to remove missing ideas and responses to questions about relevant information. Frequency distribution tables' graphs and narratives are used to present the findings. Frequency distributions, percentages and odds ratios (OR) with 95% confidence level (C.I) is calculated for statistical significance tests between variables was used to identify predictors the immunization program implementation status. Qualitative Observation/inspection and document review was analyzed manually using thematic and content analysis and results are presented in narrative form. Finally, data from different



sources triangulated to produce valid information. The program components are judged based on the set criteria of the judgment matrix analysis to declare the implementation status of immunization program. Five (excellent, very good, good, low and very low) Criteria are well implemented.

2.5. Ethical consideration

Ethical approval and clearance obtained from Mekelle University, college of health sciences (research and ethics Committee). Through formal letters from Mekelle University the responsible body was communicated. Verbal and written consent also obtained from stakeholders to ensure their voluntariness. Participants were informed about the purpose of the study. All data accessed kept confidential, to ensure confidentiality, stakeholders name was not identified.

3. Results

3.1. Socio-demographic

A total of 440 respondents and 2 health centers were enrolled in the study. The age range of 89.5% of the respondents was 20-39years. Majority of the respondents were females (99.8%), More than eight of ten respondents were married (89.3%) and seven of ten (70.5%) respondents reached primary school and above education level. Of the total respondents 69.5% and 30.5% were non pregnant and pregnant mothers respectively. Orthodox was the dominant religion (91.4%) followed by Muslim (7.7%). Majority of the respondents were self-occupied at home named as house wife (75.2%) and taking the responsibility mothers of family care at home (97.7%).



3.2. Availability Dimension

In each health center 100% trained human resources, cold boxes, function refrigerators, ice bags and vaccine carrier, standard registrations books, tally sheets, safety boxes, incinerator and enough space immunization service delivery and cold chain room were secured. In addition to that the availability IEC/BCC material, proper incinerator, safety Boxes, infrastructure (electricity, water, transportation, tel), and antigen & AD syringes were 60%, 74%, 84% and 92%. Therefore, the overall judgment of the availability dimension was found to be (89.7%) good (Table1)

3.3. Compliance Dimension

Immunization service accessibility was 100% and Antigen wastage rate >10%. There was high dissimilarity of the antigen wastage rate between health centers. E.g. measles wastage rate was 10% at Wukro health center and 43.5% at conereal tadele health center. In all health facilities there were continuous cold chain follow up (two times per a day temperature recorded) except rarely break off, clean refrigerator compartments and antigens were properly placed indifferent compartment according their heat or cold sensitivity & refrigerator temperature situation was 2- 80c. There was no health education program related to the immunization program in all health centers but they information related to vaccination to individual clients was given on regular bases. The source of information was 57% HEWs, 28.6% health institutions, 13.2% mass media and 0.5% others. Evaluation revealed that compliance of the program to proportion of health facilities providing health education about immunization at least once per month was 74%. In all health institutions there was no problem of proper usage of safety boxes but there was proper usage problem of waste disposal.eg problem of on time



burning, using substandard Incinerator, etc. compliance of the program to compliance of proper usage of safety boxes and waste disposal was 75%. Since in all health facilities including health office there were monitoring chart follow up except rarely discontinue. Here the result was 95%. Therefore, the overall judgment of the compliance dimension was found (85.76%) good (Table 2)

3.4. Acceptability Dimension

Plan verses achievement and community survey confirmed that penta3 coverage was 98.8 and 98.3%. Measles and full immunization was 90.3 and 98.3%. In addition to that pregnant and non-pregnant mothers TT2+ coverage was 59.6% and 98.78 % and 29% and 92%. According national health immunization policy acceptable penta3 dropout rate was less than 5%. Documents indicated that Wukro town penta3 and measles dropout rate was 3% and 12%. 440 clients community survey related to immunization service satisfaction showed that 153(34.8%) had good satisfaction, 85(19.3%) better and 202(45.9%) excellent satisfaction but no one client had dissatisfaction. From this study we understood clients had zero dissatisfaction and 100% satisfaction of the service provision. From 440 respondents 424(95.9%) have heard about immunization service and the source of information was 242(57.07%) HEWs, 221(28.6%) health institutions, 56(13.2%), mass media, 3(0.7%) friends and 2(0.5%) other. The knowledge of the respondents is reported. 411(96.9%) and 5(1.2%) knew that the use of immunization is preventive and eradicate diseases and 100% of the respondents knew that the immunization service is giving at health institutions. 424 respondents who heard about immunization knew 327(77%) and 359(84.6%) that an infant

start and finish his vaccination at birth and nine months. Therefore, the overall judgment of the acceptance/utility dimension was found (91.36%) good (Table 3).

1.1. Data Quality Dimension

Document review and observation at HEWs, health centers and health office assured that there were harmonized reporting schedule from HEWs up to regional health bureau (from HEWs to health center every month 21-23, health center to health office 23-26 and health office to regional health bureau 28-30) and Reports were arrived on time through HMIS reporting system that was through email and hard copies. Arriving reports on time was 100%. Using the completeness of reports from 95-100% excellent, 85-94%, good, 75-84% average, 50-74% below average and less than 50% poor as an indicator. The national standard report format 2 years of 2 health centers and health office retro report documents reviewed. The result indicated reports were 100% complete. From 24 past two year's reports (20014-2015) of two health centers random 12 reports selected & registration, tally sheet and report data accuracy using BCG, polio3, pcv3, Heb3, Rota2, measles and PAB data as indicators had been checked. This investigation proved that the data was 85% accurate. 91.6% penta3, polio3, and pcv3 report data was accurate. Report based and community survey immunization coverage of Wukro town health showed 90.3% and 94.4%. This indicated the immunization coverage difference was only 4.1% and relevancy 96.3%. Lots Quality Assurance Sampling (LQAS) standard indicate that the cumulative result from 95- 100% excellent, >85% better, 70-84% good and <70% poor. When we saw Wukro town health data was 95%. This has been approved



by taking 12 months report selected randomly from 24 past two year's reports (2014-2015) and Woreda health office regular ISS and LQAS report documents also approved this finding. Therefore, the overall judgment of the data quality dimension was found (94%) good (Table 4)

2. Discussion

Securing required resources was evidenced to be a guarantee for attaining immunization program implementation objective. Availability of resources (functional refrigerator, cold boxes, vaccine carriers and ice bags) for immunization service was 100%. This result was different from 61.8% availability of health centers functional refrigerator that showed annual performance report of Ethiopia 2002013/14 EFY (14). This difference might be related to difference of proper refrigerator handling, management and maintenance. The results of this evaluation revealed that the study health centers fulfilled most of required equipment and antigens for immunization service according the Woreda immunization micro plan with shortage of BCG antigen for two months in 2015. This 92% antigens availability result is different from Wukro Woreda 2015 fulfilling 100% antigens micro plan. This could be due to stock out of BCG antigen at national level. It was noted that immunization service accessibility was 100%. This result is different from 89% National Health Service accessibility (20) but fit with the national standard because for 45214 population size one health center is needed but there are two health centers and one general hospital which provided immunization service. Wukro town health immunization study result showed that antigen wastage rate was BCG 20%, measles 21%, polio 8%, PCV 8% and TT4%. It is below the national wastage rate standard that is 30% for measles, 50% for BCG, 5% for polio, PCV and TT dose (6). But it is high and there was dissimilarity between health centers (E.g. measles wastage rate was 10% at Wukro health



center and 43.5% at Conereal Tadele health center). Here saving antigen resource is poor so need more attention. The study confirmed that penta3, measles and full child immunization coverage was 98.8%, 90.3% and 90.3%. This result is greater than 91.1%, 86.5% and 82.2% annual performance report 2013/14 EFY (14). Penta3 and measles dropout rate was 3% and 12% this is also lesser than 35.6% drop out of national EPI coverage survey report in Ethiopia 2002013/14(14). This difference could be due to the strength of social mobilization. 40 The study revealed 96.36% respondents knew about vaccination and its objective. This finding is different from study conducted in ambo Woreda, central Ethiopia 79.5% (22). In addition to that 77% knew when child should start and finish the vaccination this finding is also different from the study done in ambo Woreda 45% and 67.5% (22). This difference could be due to the strength, different method and continuity of health education. The study indicated that LQAS data quality of Wukro health institutions is 95% and 91.6% of the reports have similar data between penta3, polio, & pcv3. This finding fitted the excellent (95- 100%) national health information management system manual standard (23). This finding could be due to the presence trained human resource, continuous follow up and functional performance team.

3. Conclusion

The implementation of the immunization program was good. However, the evaluation identified a few challenges for future program success including, Shortage/lack of updated, enough and different types of IEC/BCC materials, shortage transport for EPI focal person, having no family folder and standard HMIS reporting format at HEWs, under standard incinerator, high antigen and drop out, low TT2+ coverage, having no program logical model, performance difference between health centers and Kebele, community awareness gaps, etc.



The overall achievement of the immunization program in the town is good when compared to the predetermined evaluation judgment criteria.

The general conclusion that could be drawn from the overall level achievement was in need of improvement from good to excellent level performance in order to realize all of the objectives of the intervention.

4. Declaration

4.1. Ethics approval and consent to participate

Ethical approval and clearance obtained from Mekelle University, college of health sciences (research and ethics Committee). Through formal letters from Mekelle University the responsible body was communicated. Verbal and written consent also obtained from stakeholders to ensure their voluntariness. Participants were informed about the purpose of the study. All data accessed kept confidential, to ensure confidentiality, stakeholders name was not identified.

4.2. Consent for publication

The authors gave their consent for publication of this original research work.

4.3. Availability of data and material

The authors ensure the availability of data and material of this research work and are ready to provide when requested.

4.4. Competing interest

The authors declare no competing interest



4.5. Funding

This study was funded by Tigray regional health bureau and Mekelle University

4.6. Author contributions

Kiros Demewez¹ conceived the study idea, designed and performed the analysis and the write up on methods, and designed first draft of the manuscript. All the authors participated in designing tools, data management, analysis and the write up. All authors have read and approved the manuscript.

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