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Process Evaluation on the Quality of Routine Expanded Program on Immunization (EPI) in Dire Dawa City Administration, Eastern Ethiopia

By

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Thesis Submitted to Addis Ababa University, School of Graduate Studies as Partial Fulfillment of the Degree of Masters of Public Health

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June 2010

Addis Ababa

Acknowledgement

I want to first present my deepest gratitude to my Advisor Professor Damen Haile Mariam for his highly valuable efforts not only for completing this paper but also for showing me the way what I should not do when I have not to do so.

Next my thanks goes to Habtamu Tesfaye, when I remember how much you did suffer the time I had lost my computer in addition the things you were doing for me and frequent advice from the beginning, I want to say thank you, Ochee.

Also I want to thank staffs working at Dire Dawa Health Bureau and facilities for their very cooperative nature during the study period.

Table of Contents

Acknowledgement II

List of Annexes V
List of Tables and Figures VI
Acronyms VII

Abstract VIII
1. Background 1

1.1 Introduction 1
1.2 Statement of the Problem 1
1.3 Significance of the study 2
2. Literature Review 3

2.1 Global Immunization Situation 3
2.2 National Situation 3
2.3 Strategies of Immunization Delivery 4
2.4 Utilization of Immunization 5
2.5 Definition of Quality of Healthcare 5
3. Objectives 7

3.1 General objective 7
3.2 Specific objectives 7
4. Methods 8

4.1 Study area 8
4.2 Study design 8
4.3 Study population 8
4.4 Sample size Determination 8
4.5 Sampling Procedures 9
4.6 Data Collection Procedures 9
4.7 Data Quality Assurance 9
4.8 Operational Definitions 10
4.9 Data Analysis Procedures 10
4.10 Ethical Consideration 11
4.11 Dissemination of Results 11
5. Results 12

5.1 Structural Quality 15
5.2 Process Quality 17
5.5.1 Reasons for Satisfaction 22
5.5 Structure, Process Quality and Client satisfaction Rate 22
6. Discussion 27

7. Limitation and Strength of the Study 33

7.1 Strengths 33
7.2 Limitations 33
8. Conclusion and Recommendations 34

8.1 Conclusion 34
8.2 Recommendations 34
References 36

Annexes 40

List of Annexes

Annex 1…… Observation Checklist for structure and Part of process of Quality

Annex 2……. Observation Checklist for Process of care client receive in immunization

Annex 3…… Self-administered Questionnaire for EPI Coordinators

Annex 4…….Exit interview Questionnaire for caretakers

Annex 5…… Immunization Quality Attributes and Weighted Scores Given

Annex 6……Participants Information Sheet

Annex 7……Amharic version of Participant Information and Consent Form

List of Tables and Figures

Table 1.....Characteristics of Health Facilities, Providers and Caretakers

Table 2..... Description for Structure Quality Attributes

Table 3……Information delivered about immunization in the room, Dire Dawa, 2010

Table 4……. Care Immunization Clients Received at Hospital & Health center

Table 5……. Frequency of Response for Reasons for Clients Satisfaction

Table 6…….Description for the measurement scales for immunization quality components

Table 7……Description of ratios for the quality of Immunization, Dire Dawa, 2010

Table 8…….Regression Analysis between Structure, Process & Satisfaction rate

Figure 1……..Framework for Evaluating EPI

Figure 2……Comparison for Immunization Coverage between Urban and Rural HF

Figure 3……Percent of Scores for Structure, Process and Satisfaction Rate

Acronyms

AAU	Addis Ababa University
BCG	Bacillus Calmette- Guérin
DPT	Diphtheria Pertussis Tetanus
EDHS	Ethiopia demography and health service
EPI	Expanded program on immunization
FIC	Full immunization coverage
HBV	Hepatitis-B virus
HC	Health center
HF	Health facility
HI	Health institution
HP	Health post
MDG	Millennium Development Goal
NGO	Non-governmental organization
NID	National immunization days
OPV	Oral polio vaccine
RHB	Regional Health Bureau
SNNPR	Southern Nation, Nationalities and People Region
Unicef	United Nations children's fund
USAID	United States Agency of International Development
WHO	World Health Organization

Abstract

Background: Dire Dawa is a city administration and among the smallest administration regions of Ethiopia both in terms of size and number of population. In spite of good opportunity for easy manageability to achieve the immunization coverage target set by FMOH, there has been low immunization coverage compared to other regions of the country for the past five years.

Objective: To assess the structural and process quality of routine EPI and their outcome in terms of client satisfaction.

Methods: Data collection for this evaluative research was conducted from February 5-26/2010 at 11 public health facilities found in Dire Dawa. Components for quality of immunization care were assessed using Donabedian's model.

The study is descriptive cross-sectional health facility based survey. Stratified sampling for selecting the facilities and systematic sampling for the exit interview were used. The stratification considered level of the health facility and place where they did exist. As the interview was conducted for 385 mothers or guardians, simultaneous observation of care provided was being conducted in immunization rooms. On the other hand, record review for assessing immunization coverage and accuracy of reporting; also self-administered questionnaire for EPI coordinators was employed.

To judge the quality of components as a whole a weighted scores were given for the variables under structure and process.

Result: The result from analysis shows that structural quality was found at better position (out of the maximum 31, mean score=19.7) and clients satisfaction rate also higher (95%). But low quality was found regarding the process of care (mean score is 22.8 out of 45). The full immunization coverage calculated was 61.5% for the previous fiscal year.

Conclusion: In spite of better structural quality compared to other regions and higher satisfaction rate, full immunization coverage was low.

1. Background

1.1 Introduction

Around 29,000 children under the age of five die each day worldwide mainly due to vaccine preventable diseases. Most of the deaths occur in developing countries especially in Africa. These diseases kill about 470,000 children of Ethiopia per year and an Ethiopian child has 30 times probability of death by his or her fifth birthday than a child found in Western Europe (1, 2).

Expanded program on immunization (EPI) was launched in Ethiopia in 1980 to achieve universal child immunization by 1990. In spite of the improvement in immunization coverage over the past many years, achieving this goal becomes difficult to the present time.

According to a national EPI survey of 2006, a 10 percentage increment in coverage of DPT3 was found compared to 2001 survey. Similarly the 2005 EDHS indicated the percentage of children age 12-23 months fully vaccinated increased by 43 percent from 14 percent in 2000 to 20 percent in 2005 although the percentage who had received none of the six basic vaccinations increased from 17 percent in 2000 to 24 percent in 2005. However, great variation was observed between the regions. For example, for some regions DPT3 coverage in 2006 was below 30 percentages but for many regions it was below 80% (3-5).

1.2 Statement of the Problem

In spite of Dire Dawa Health Bureau efforts of increasing potential health service coverage to 100% and equipping some facilities beyond the country's standard human power such as health posts with nurses, the full immunization coverage is below 50% for the past four years. According to FMOH 2007/08 health indicators, larger regions like Tigray, Amhara, Oromia and SNNPR achieved coverage of 74.0%, 60.9%, 60.4%, and 84.9% respectively whereas Dire Dawa had 44.2% in the same year. Compared to neighboring regions like Harari in which there is similar culture and socioeconomic condition, their 75.5% coverage was too high relative to Dire Dawa. The 2007/08 annual report indicated even lower coverage than it had been observed 49.1% in 2006/07 (6-9).

Stagnant and sometimes lower performance of the program from the previous years in the administration health system calls a special area for study to have insight for contributing factors by evaluating quality of the immunization.

1.3 Significance of the study

To help responsible bodies to identify the strength and weakness that might either foster or hamper the progress towards the required goals. Similarly identification of the problems of the program can point where the actual place of intervention should be and help to take corrective action for improving the coverage.

Therefore, this evaluative research needs to be conducted to address the problems with the program by assessing EPI quality components.

2. Literature Review

2.1 Global Immunization Situation

After the global launching of EPI in 1974, an estimated 20 million under-five children deaths were enabled to be prevented by the program in the past 2 decades. Immunization coverage also increased globally from less than 5 percent in 1974 to almost 80 percent in 2004.

Although it has been planned for 90% routine immunization national coverage by 2010 or sooner worldwide, the presence of about five million African children un-immunized for DPT3 in 2007 indicates many countries in the continent were unable to achieve the goal (10).

2.2 National Situation

Ethiopia had achieved an annual average of 1.2% modest reduction in under-five mortality in 1960-2000. The plan is to increase the reduction rate to 7% starting from 2004 in order to achieve the intended MDG (11).

Routine public sector report indicates that neonatal tetanus causes 17,900 infections and 13,400 deaths annually that placed Ethiopia the fourth affected country in the world. Also pertussis and tuberculosis are common. Ethiopia would have been certified as polio free by the year 2005 but not yet achieved (11).

Also global target of reaching at least 90% measles coverage for 2005 to reduce measles mortality by half from the base year 1999 level was not achieved by Ethiopia where the coverage stood at 20.8%. Measles with a fatality rate of as high as 15-20% in times of epidemics and 3-5% in usual situation remained the major killer disease causing as much as 18,800 childhood deaths per year in Ethiopia (12).

But the country has achieved tremendous progress in its Polio Eradication Initiative activities since it commenced in 1996. OPV coverage rates increased appreciably from less than 400,000 children in 1996 to more than 14 million in 2000, leading to reduced transmission of the virus. In 2007, no wild poliovirus has been identified in Ethiopia and the country has been categorized as an area with low transmission (13).

Recognizing the huge and unacceptable social and economical costs of the prevailing childhood morbidity and mortality, FMOH started EPI in 1980 with target to vaccinate under two children against six vaccine preventable diseases and women in the child bearing age against tetanus at the beginning. At this time, the objective was to improve the coverage by an annual rate of 10% with an ambitious target of achieving 100% by 1990.

As it was discovered at later years, with a modest average annual growth of only 3.4% for DPT3 both the international and national target of universal coverage for EPI was not any nearer to its realization. By 1994, the national immunization coverage for DPT3 and measles vaccines was 37% and 29%, respectively. Realizing this serious drawback, the FMOH revised its coverage target as well as the children to be targeted for vaccination to less than one year olds (14).

2.3 Strategies of Immunization Delivery

Routine immunization is the basis of the EPI activities. On a regular basis vaccines for measles, diphteria, pertussis, tetanus, hepatitis B, polio and tuberculosis, are provided in static, out-reach and mobile base at health facilities in the country. Supplementary immunization activities are carried out when there is a special need to improve the coverage of a certain vaccine in a certain area. As part of the recent moves to boost the routine measles immunization services, measles supplemental vaccination are provided together with Vitamin A capsule supplementation and de-worming to children 6-59 months (11,13).

It has been suggested that in order to reach the desired immunization coverage, the service should be accessible and should be supplemented with the out-reach sites and with a special immunization day campaigns to reach the hard-to- reach beneficiaries. However, such innovative supplemental strategies along with static immunization service delivery may only be feasible if the required resources such as trained staff, cold chain equipment, vaccines, and safe injection supplies are available in a sustained manner (14).

Moreover, in addition to resource availability, the service should be delivered in accordance with the recommended national guideline in order to maximize the quality of the services. The later includes among others, ensuring the potency of vaccines, appropriate use of the injection safety procedure, introducing vaccines in the recommended age, avoiding or managing missed opportunity, creating enabling vaccination environment such as reduced waiting time, initiation

of good client-provider interaction are some of the factors that can positively affect the program success.

All these need a well established internal system of monitoring and periodic implementation evaluation in order to identify implementation gaps for the improvement of the program operations (14).

Contrary to this the 2002 national inventory in Ethiopia carried out by FMOH in collaboration with the World Health Organization came up with the findings of only 66% had functional cold chain equipment. Similar indication of the existing problem with resources was pointed by another study conducted in Oromia zone of Amhara region where one-third of the facilities hadn't refrigerator for vaccines storage (15, 16).

2.4 Utilization of Immunization

A number of factors affect health service utilization. Among this income, price, organizational and institutional structure of society, individual preferences and taste that depend on socioeconomic and cultural factors can be mentioned. For example, a study done on pastoralist in Ethiopia reported mobility pattern of living and long distance from health facilities were obtained impeding factors for modern health care utilization (17, 18).

But the study carried out in Wonago of Southern Ethiopia reported in spite of high access to immunization services, 42% of children were found uncompleted the recommended immunization schedule. The most important socio-behavioral factors reported to affect defaulting were perceived health institution support, monthly family income, postponing child immunization schedule, and knowledge of the mothers/caretakers about the benefit of immunization. Besides these, maternal education was also found as a principal factor in determining immunization status of the child according to the study in Cameron (19, 20).

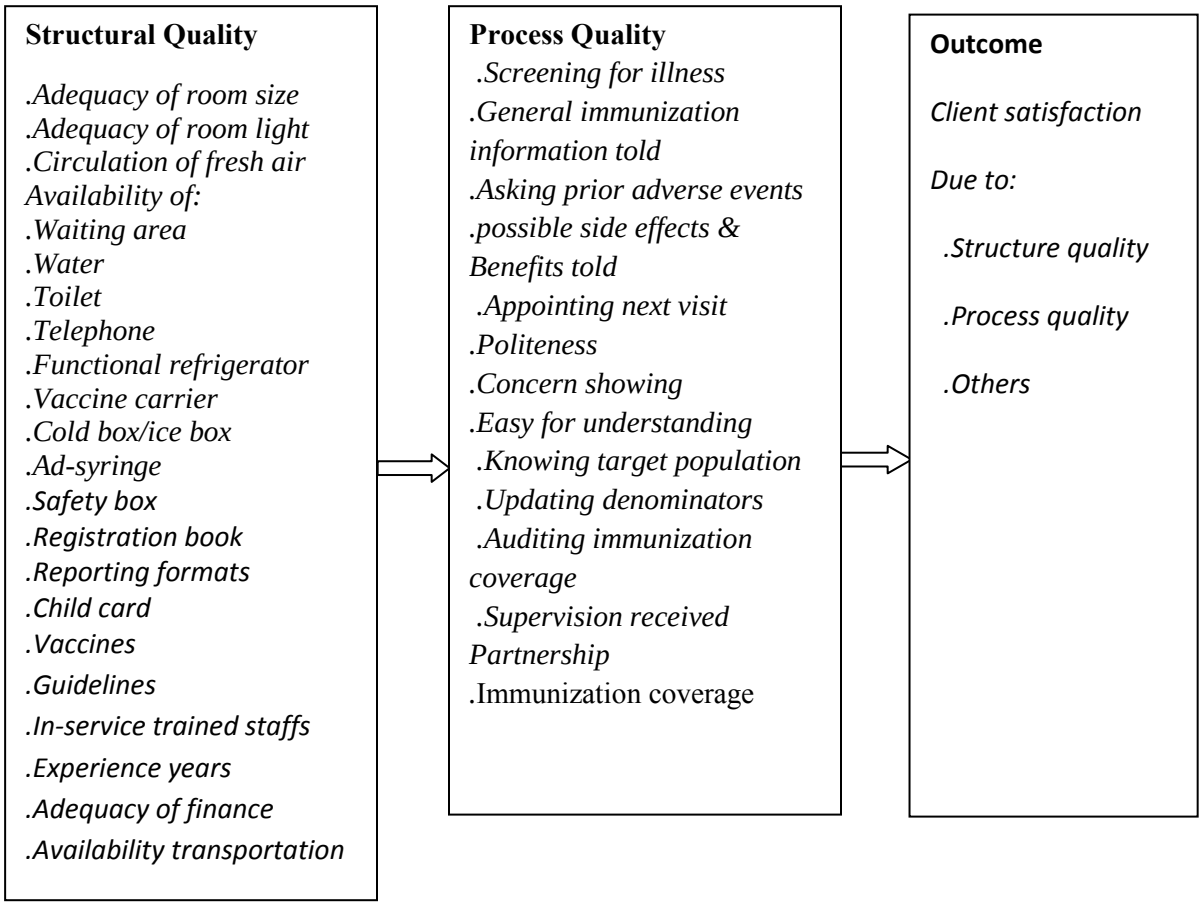
2.5 Definition of Quality of Healthcare

Assessment of quality depends on a conceptual and operationalized definition of what does it is intended to imply in that particular study. It is almost anything anyone wishes to be, a reflection of value judgment of individual or a society at particular time in the system. The criteria for

evaluating care of patient or client can vary among different researchers and the type of service selected. Generally it has structure, process and outcome dimensions.

The presence of many possible dimensions and criteria for evaluation of quality will have a profound influence on the methods and approaches one employs for assessment of medical care (21). But the structure-process-outcome approach is used extensively in health services researches in evaluating quality (22). This study also used this method as it is shown in the following frame.

Figure 1. Framework for Evaluating EPI Quality



3. OBJECTIVES

3.1 General objective

To assess the structural, process and outcome (in terms of client satisfaction) quality dimensions of Routine EPI program of Dire Dawa City Administration

3.2 Specific objectives

1. To assess the structural qualities of the EPI program with regard to staffing, materials, drugs and supplies as well as pattern of service delivery and supervision.
2. To assess the process qualities of the EPI program focusing on provider-client interaction, use of equipments and supplies for EPI activities, reporting and recording, the process of care given to clients and immunization coverage;
3. To assess clients satisfaction level in the given service; and
4. To assess any correlation among the three quality parameters of the EPI program

4. Methods

4.1 Study area

The study was conducted in Dire Dawa Administration with a total population of 368540 in which the majority (76%) of the population reside in urban. Semi-desert characterizes regional climate and trade is the main livelihood for the urban dwellers whereas the rural population are agrarian and pastoralist. One hospital, 13 health centers and 37 health posts constitute the public health sector of which the hospital and 8 health centers are found in urban (25).

4.2 Study design

Descriptive cross-sectional health facility based survey using quantitative method.

4.3 Study population

All mothers or caretakers that came to public health facilities for immunizing their child and the available structural qualities and process of care delivered at public health facilities in the administration.

Inclusion Criteria: Public health facilities that were providing immunization services since 2003/04 considering the commencement of the problem went back five years ago.

Exclusion Criteria: Public facilities that started the service since 2005 and all private health facilities

4.4 Sample size Determination

In order to ensure representativeness of the facilities, proportion and place where health facilities reside besides the livelihood of the population to be served had been put into consideration.

For the exit interview the sample size was calculated using single population proportion formula. In Dire Dawa 98% of mothers go to health facilities for first immunization visit of their children (DPT1= 98%), however, among these only 44% of them did finish the whole vaccine doses (3, 6). This implies 54% of population doesn't finish the whole course of immunization for their children. To assess problems with care they receive and their satisfaction, at 95% confidence interval, and a 5% margin of error (E) using the formula and also upon assuming the expected

non-response rate equal to 10%, the total sample size calculated for the exit interview was as follows: 381 + 381x0.10= 419

$$n = \frac{\left(Z^2 \alpha/2 * P(1-P)\right)}{E^2}$$

4.5 Sampling Procedures

Except the only hospital in the region; stratified sampling by the place where the health centers exist (urban vs rural) was used for sampling. Two health centers from the total of 8 found in urban area and also from rural, equal number were selected randomly among the total of 7 found in this area. Selection of 6 health posts used stratification based on the livelihood of the community to be served by them and randomly 3 health posts from pastoralists' and 3 from the agrarians' areas were selected. Systematic sampling was used for conducting the exit interview and observing care they received.

4.6 Data Collection Procedures

The data collection was carried out from Feb.5/2010-Feb.26/2010. Observation checklists were used for collecting data on the variables under structural and some part of process aspects of immunization qualities. Observation for the process of care clients received in immunization room using the list and simultaneously clients exit interviews were conducted for assessing satisfaction using structured questionnaire. Appropriate records were reviewed and also self-administered questionnaires targeted to be filled by EPI coordinators had been conducted.

4.7 Data Quality Assurance

To ensure quality of the data, properly designed data collection instrument was used by adopting WHO and other researchers' tools. After through two days training had been carried out for data collectors and supervisor, pre-testing and then the necessary adjustment were done on the tools.

Exit interviews were conducted by questionnaire that had been translated to local languages. Data collectors employed for exit interviews were also those who could speak the local languages and health professionals, too. Observation of the process of care clients received during immunization was done using nursing students practicing there.

For the whole period of data collection supervision and checking for the collected information were being done by the principal investigator and supervisor.

4.8 Operational Definitions

Process evaluation: focuses on 'process' of evaluation that may use quantitative or qualitative measures to assess inputs, activities and outputs and to examine how the intervention is organized, delivered and received.

Structure Quality: indicates the setting in which immunization service delivered

Process Quality: refers to the process of service provision comprised of technical and interpersonal elements.

Outcome: represents the effect of immunization care or service provided to clients.

Routine immunization: immunization service provided in the health facilities (static immunization) and for the community residing above 5km (out-reaches).

Cold chain: A system of people and equipment, which ensures that the vaccine reaches to children kept at the correct temperature.

Missed opportunity: - When an eligible child visited the selected health facility and does not receive any or all of the vaccine for which he/she is eligible.

Full immunization: Surviving infants who received all doses of infant antigen.

Indicator: signal that reveals progress (or lack thereof) towards objectives; means of measuring what actually happens against what has been planned in terms of quantity, quality and timeliness.

Potential health service coverage: The population covered in percentage based on the existing health centers and health stations in the catchments area.

4.9 Data Analysis Procedures

SPSS version 16 computer software was used for the analysis. Chi-square test of independence for categorical variables and t-test for continuous variables were done. Two step analyses was

used where values of the variables that had been obtained from observation, providers' interview and mothers or caretakers interview were organized in to their pertaining quality component.

For the purpose of measuring the associations between structure, process and outcome and to judge their quality, weighted scores were given for the variables of structure and process by regional EPI experts.

Independent Variables: Structure quality, process quality and clients' satisfaction

Dependent Variables: Immunization coverage

4.10 Ethical Consideration

Letter of ethical clearance from Addis Ababa University, Medical Faculty, and School of Public Health was delivered to Dire Dawa Health Bureau. Full explanation about the purpose of the study was made to the persons in charge of health institution, immunization program and interviewees. The respondents were informed of their right to refuse or agree to participate in the study, or discontinue their participation whenever they feel the need. Privacy was being maintained during data collection, and confidentiality of the data has been ensured.

4.11 Dissemination of Results

The whole process of this evaluation research, starting from planning till conclusion and recommendation involved relevant stakeholders. Preliminary analysis result obtained from the analysis in this study was also presented for the heads and EPI coordinators of the surveyed health facilities (excluding health posts) and EPI experts at the Regional Health Bureau before submitting the paper to AAU.

5. Results

Characteristics of the facilities, providers and mothers or guardians

One hospital, 4 health centers and 6 health posts that make a total of 11 facilities were included in the survey. Of these; 2 health centers and the hospital were from the urban place and the remaining 2 rural health centers and all health posts (3 from agrarian & 3 from pastoralist area) from the rural part (Table 1).

There were a total of 36 immunization service providers with a professional qualification of nurse and health extension worker. The majority of the providers 59% was diploma nurses in which they were found working at the hospital, health center and health post. Their qualification levels range from 1(3%) first degree holder nurse to 10 (37%) HEW. An average of 2 HEWs did work together with one nurse at each health post (Table 1).

A total of 401 mothers or guardians were interviewed for satisfaction up on leaving the immunization session. Among these; from a total of 385 respondents the required information were obtained while questionnaires for 16 (3.9%) clients found invalid as the clients had stopped in the middle of interview before giving important information.

The data consist of 351 (91%) clients from health centers and 34 (8%) from the hospital. Among these 296 (76%) were from facilities found in urban where the same proportion of the administration population resided in and 89 (23%) from rural part. No immunization client was obtained at the health posts as the health extension workers used to visit at their homes.

The mean age of the clients was 26.1years with SD$\pm$ 6.3 and most of the clients (89%) were found between the ages of 20 and 40 years.

Married clients 357 (92%) comprise the largest marital status share whereas the remaining small proportion of 8% were in the rest marital categories. With regard to religious aspect; Islam 279 (67%) and Orthodox Christianity 102 (26%) were the majority 93% of clients did respond to believe in.

Housewife is an occupational status for around two-third (68%) clients followed by 65 (16%) merchants, 27 (7%) government and private enterprise employees sequentially. The average monthly house hold earnings below 800 Birr were an income for around two-third (62%) of the clients.

Regarding educational level of caretakers more than one-third (39%) had not attended any formal education and the remaining 61% could read and write. 57% of the literates were with primary and above that level (Table 1).

Table 1: Characteristics of Health Facilities, Providers and Clients, Dire Dawa, 2010.

Characteristics	Frequency	Percent
HF Level		
Hospital	1	9.1
Health Center	4	36.4
Health Post	6	55.5
Total	11	100
Providers Qualification		
BSC Nurse	1	2.7
Diploma Nurse	16	44.4
HEW	10	27.7
Total	36	100
Socio-demographic Characteristics		
Age groups		
< 20 years	34	8.8
20-40 years	345	89.6
> 40 years	6	1.6
Marital status		
Married	357	92.7
Never married	5	1.3
Divorced	18	4.7
Widowed	5	1.3
Educational level		
Illiterate	152	39.5
Read & write	10	2.6
1-6 grades	95	24.7
7-12 grades	109	28.3
> 12 grade	19	4.9
Religion		
Muslim	259	67.3
Orthodox	102	26.5
Protestant	21	5.5
Ethnic origin		
Oromo	194	50.4
Amhara	99	25.7
Somali	55	14.3
Other	37	9.7
Occupation		
Government	27	7.0
Private enterprise	23	6.0
Merchant	65	16.9
Housewife	264	68.6
Other	6	1.6
HH monthly income		
≤ 450 Birr	92	23.9
451-800 Birr	150	62.9
> 800 Birr	143	37.1

5.1 Structural Quality

Physical infrastructure: Around two-third (63%) of the facilities did not have a problem with sufficiency of the room size or arrangement to allow staffs and clients free movement. However; at 4(36%) facilities such a problem was observed in which 50% of them were health posts.

Optimal illumination of the room lacked in 3 (27%) facilities. Of these 66% were health posts in which all found in areas where agrarian population being served.

The adequacy of fresh air availability in the rooms was the attribute of around half (54%) of the facilities but nearly equal number had no openings for allowing circulation of fresh air.

All rural health centers were found at better room conditions of having adequate size, light and air circulation in contrast to the urban health centers that did face a shortage of at least one of these. The hospital was at the lowest position compared to health centers with inadequate room size as well as shortage for circulation of fresh air (Table 2).

All health centers and the hospital had not problems with water, toilet, telephone and waiting area availability. But health posts were the facilities with these problems where all had not telephone access, 66% without water, and 3 (50%) of them did not avail waiting area for clients. Also less than half (33%) of the health posts were without toilet access.

Equipment and supplies: All facilities had vaccine carrier, ice box, safety box and auto-disable syringe except functional refrigerator was not available in 1 (9%) facility (Table 2).

Recording and reporting formats: Immunization recording book, reporting format and individual children immunization follow-up card availability were observed in all facilities.

Vaccines: All types of vaccines for children (BCG, DPT-HVB-hib, OPV and measles) were obtained availed in 100% of the facilities.

Guidelines: EPI guidelines or protocols that deal with vaccine schedule, administration technique, contraindication, management of adverse events and vaccine storage were not found in all facilities.

Human power: Average number of staffs working in immunization per facility was 2.4 with SD $\pm$ 0.68. Among the total EPI coordinators, 7 (63%) of them did report with one and below year of working experience on immunization. Coordinators who were in charge of immunization activities at all health posts had been found in this group. Three and above years of experience were reported by 3 (27%); among these two-third of them resided in urban health facility.

Even though the number of staffs working on immunization reported to be adequate in all facilities, any of these who did receive in-service on EPI were found at 57% of the facilities. The rest 43% of them had not a staff who had received any in-service training within the past 3 years.

Finance and Transport: Finance allocated for per Diem and supervisory activities of out-reach was reported adequate in 9 (82%) of the facilities. But its inadequacy was reported in the hospital and one urban health center.

Transport was available in 8 (72%) of the facilities from these motor bicycle in 7 (63%) and vehicle in 1 (9%) were used for out-reach and other activities related to immunization. The rest 3 facilities had not transport and used to walk for the mentioned activities (Table 2).

As it is shown in table 2 no significant association is found between the structure quality components and type of health facility except for telephone access ($p<0.05$)

Table 2: Description of Structural Quality Attributes Availability and Adequacy for Health Facilities Level, Dire Dawa, 2010

Characteristics	Number (%)			χ^2	p-value	Sig.level
	HS	HC	HP			
Adequate room size	-	3 (27.3)	4 (36.4)	1.997	0.368	NS
Adequate room light	1(9.1)	3 (27.3)	4 (36.4)	0.497	0.780	NS
Optimal ventilation	1(9.1)	3 (27.3)	3 (27.3)	1.975	0.382	NS
Water access	1(9.1)	4 (36.4)	2 (18.2)	5.238	0.073	NS
Toilet access	1(9.1)	4 (36.4)	4 (36.4)	2.037	0.361	NS
Telephone access	1(9.1)	4 (36.4)	-	11.000	0.004	S
Waiting area	1(9.1)	4 (36.4)	3 (27.3)	3.438	0.179	NS
Functional refrigerator	1(9.1)	1 (36.4)	5 (45.5)	0.917	0.632	NS
Finance adequacy	-	3 (27.3)	6 (54.5)	5.958	0.051	NS
Transport	-	3 (27.3)	5 (45.5)	1.964	0.375	NS
In-service trained	-	2 (22.2)	2 (22.2)	0.900	0.638	NS

HS= hospital, HC= health center, HP= health post, NS= not significant association

5.2 Process Quality

For a total of 392 clients when different types of technical care done were observed in immunization rooms excluding the health posts.

Among the children entered the services, 123 (31%) of them were observed to be screened for any of the clinical encounters before administering the vaccine. The highest number of screening was carried out in the hospital where around half (48%) children screened. The majority (75%) health centers did screen for around one-third of children and the least performance was observed in one rural health center where only 10% children screened.

Children who visit hospital have twice more likely of being screened than health center visitors [COR, 95%CI= 2.24(1.11, 4.51); AOR, 95%CI=2.062(1.011, 4.204), p<0.05].

From the total caretakers, 162 (41%) of them were not told any type of general information about immunization. More than eighty percent of the clients were not received information about diseases preventable by vaccines 323 (82%) and the need to vaccinate at the recommended ages 338 (86%). Information with relatively higher frequency that was told for immunization visitors comprises of recommended schedules 160 (40%) and the general importance of immunization 146 (37%). However, these proportions are small compared to around two-third of the clients who were not educated about it.

The importance of immunization was not told for 246 (62%) of the clients. At hospital very small proportion of clients (5%) got this information compared to health center level of 40%. In case of the place where the facilities are found, urban health facilities informed the importance for 39% of the clients and rural for 29 (32%).

Mothers or guardians who were informed the possible side effects or adverse events 17 (4%) and benefits 20 (5%) of that day's vaccines are very small. In hospital 97% of the clients were not told is as similar as that of health center with 95%. The same result is also found between urban and rural facilities (95.5% vs. 95%). However, appointment for next visit was informed for all clients (Table 3).

Table 3. Description of Information told to Clients about Immunization, Dire Dawa, 2010

Type of Information	Number	Percent
Importance of immunization	146	37.2%
Diseases vaccine prevent	69	17.6%
Recommended schedule	160	40.8%
The need to vaccinate at recommended age	54	13.8%
Possible side effects	17	4.3%
Benefits from the day's vaccine	20	5.1%
Next visit appointment	392	100%

Almost all clients 388 (99%) were not asked prior adverse events related to immunization before administering the vaccines. In hospital none of the clients was requested for the adverse events but it was carried for 1% health center visitors.

From the data of the exit interview conducted for 385 mothers or guardians, half of the clients 193 (50%) did mention that the providers they were being served polite. Also nearly the same proportion of clients 203 (52%) with the above gave value for the concern they obtained from the provider. The ability of the providers to communicate with clients was far below half where the proportion of clients who did mention that the provider was easy to be understood were 141 (36%) and allowed to ask questions 95 (24%).

Temperature monitoring chart was available in all facilities although 6(54%) of them were obtained to control the temperature twice a day throughout the week. Abnormal storage temperature was observed at 1(9%) facility which was the hospital.

Management: As table 4 shows, among the facilities included in the survey only 1(9%) of it neither did not know the target population < 1year nor update the denominators for individual antigens. Monitoring or auditing immunization coverage levels was not conducted for more than half (56%) of the facilities.

By taking the ratio between what was recorded and reported, the mean accuracy rate is 93.3% (SD±1.02). Higher accuracy rate of 100% was found at the hospital followed by health centers (94%) and lastly by health posts with 91%. There was no difference between the urban and rural health facilities (mean accuracy rate 93% vs. 93.4%).

8 (72%) of the facilities did not receive supervisory visit from the higher level within six months before the survey. Especially all health centers and the hospital were not supervised during this time (Table 4).

Regarding functionality of partnership in immunization, 5(45%) facilities found in the administration reported that they did not work with any of local private health facilities, kebeles and associations (Table 4).

Table 4: Description of Other Technical Care Immunization Clients Received, Management and Vaccines Storage Condition of HF, Dire Dawa, 2010

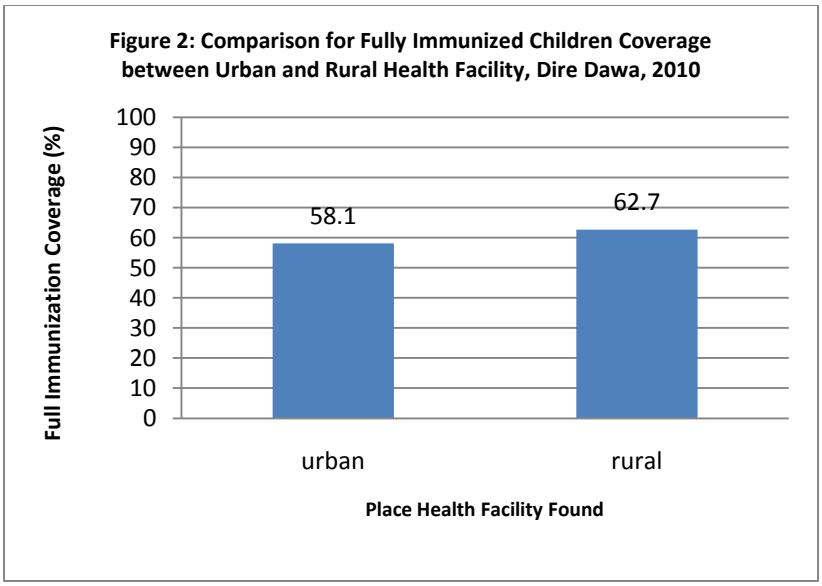
Characteristics	Frequency	Percent
Screened children [a]	123	31.4
Prior adverse event asked [a]	4	1.0
Politeness recognized [b]	193	50.3
Concern shown [b]	203	52.7
Easy to be understood [b]	141	36.6
Audit immunization coverage	5	45.5
Target population known	10	90.9
Up-date denominators	10	90.9
Cold chain monitoring chart availed	11	100
Monitored twice/day throughout week	5	45.5
Normal storage temperature maintained	10	90.9
Supervision received	3	27.3
Work with local partners	5	45.5

n_a=392, n_b=385

5.3 Immunization Coverage

The calculated mean of fully immunized children was 61.5% for year 2008/09. All levels of the facilities in the region had almost similar coverage rate for the year mentioned [hospital (61.3%), health centers (61.1%) and health posts (61.8%)].

Rural health facilities had 62.7% mean coverage while 58.1% for the urban facilities. This is also true among health centers where rural (65.7%) had a higher coverage than urban health centers with the average coverage of 56.5%. Regarding the livelihood of the population to be served by the health posts, agrarian health posts had a mean coverage of 67.8% compared to 55.8% of pastoralist areas (Figure 2).



5.4 Client Satisfaction

Five levels of satisfaction i.e. very satisfactory, satisfactory, neutral, unsatisfactory and very unsatisfactory were used for the assessment to be rated by the clients up on leaving the immunization room.

Among the total of 385 clients rated their satisfaction with the total service they had obtained, 251 (65%) of them responded it was very satisfactory and 117 (30%) satisfactory. These make the proportion of clients totally satisfied to reach 368 (95%).

Satisfaction is higher among illiterates 141 (40%) as compared to better educated clients with an educational level of greater than 12 grade (84%). Mothers or guardians who were not married, divorced and widowed had higher proportion of satisfaction than the married ones (100% Vs 92%).

Concerning the place of residence, among clients who did visit the rural health facility 96% of them were satisfied and from the urban areas 98% were obtained satisfied.

From the chi-square test the socio-demographic characteristics of clients are not found to be associated with satisfaction.

5.5.1 Reasons for Satisfaction

The most frequently mentioned reasons for satisfaction were short waiting time 195 (52%) and technical skill of the provider 151 (41%). The least satisfaction reasons were availability of waiting area 73 (19%) and screening the child 35 (9%).

Almost negligible number of clients responded unsatisfied in which 11 (2%) of them were rated their response unsatisfactory and only 1(0.3%) client's response was very unsatisfactory. Long waiting time and problem with technical skill of the provider are the major reasons that were mentioned by 63% and 45% of the unsatisfied clients respectively.

However; from chi-square test no association is found between reasons listed and satisfaction of the clients (Table 5).

Table 5: Frequency of Responses for Reasons of Clients Satisfaction and chi-square test for independence, Dire Dawa, 2010

Reason	N (%)	χ^2	p-value
Screening child	35 (2.9)	0.734	0.391
Provider technical skill	151 (12.7)	4.809	0.028
Waiting time	195 (16.4)	7.771	0.05
Waiting area	73 (6.1)	1.730	0.88
Provider politeness	139 (11.7)	0.438	0.508
Easy to be understood	139 (11.7)	0.006	0.940
Opening hours	170 (14.3)	0.253	0.615
Distance traveled	134 (11.3)	3.585	0.058

No significant associations are found between reasons and satisfaction

5.5 Structure, Process Quality and Client satisfaction Rate

To measure the association between the components of quality weighted scores were given according to relative importance of the variables for improving performance on immunization coverage.

As Table 6 shows, a scale between 0 and 31 was given for the total structural quality considering all or none (optimal or below optimal) method of assigning the score for each

variable. For the case of process quality, in addition to assigned scores with consideration of all or none method of valuing, ratios obtained from observation and interviews was converted to scores to give a total scale between 0 and 45. Outcome that was evaluated in terms of satisfaction was given a ratio scale at the beginning. Later on, the obtained scores has been changed to ratios and then finally to percentage (Table 7).

Table 6. Description of Measurement Scales for Immunization Quality Components, Dire Dawa, 2010

			Score/varb.		
Index	**Variables**	**Scale**	**Yes**	**No**	**Total**
Adequacy	Room conditions (3 items)	All or none	1	0	3
	Finance	All or none	1	0	1
	Transportation	All or none	2	0	2
Availability	Water	All or none	1	0	1
	Working toilet	All or none	1	0	1
	Telephone	All or none	1	0	1
	Waiting area	All or none	1	0	1
	Functional refrigerator	All or none	1	0	1
	Vaccine carrier	All or none	1	0	1
	Cold box	All or none	1	0	1
	Safety box	All or none	1	0	1
	Ad-syringe with needle	All or none	1	0	1
	Guidelines (5 content)	All or none	1	0	5
	Vaccines (4 types)	All or none	1	0	4
	Recording & reporting formats (3 items)	All or none	1	0	3
	Three & above years of experience	All or none	2	0	2
	In-service trained staff (any)	All or none	2	0	2
	Structural Quality	**0-31**			**31**
	Screened children	0-1	1	0	1
Percent	Informed caretakers (7 items)	0-14	2	0	14
	Prior adverse events asked	0-1	1	0	1
	Appointment for next visit told	0-3	3	0	3
	Politeness of provider recognize caretakers	0-2	2	0	2
	Concern shown responded clients	0-2	2	0	2
	Provider was Easy to be understood	0-2	1	0	1
	Provider allowed me to ask	0-2	1	0	1
Availability					
	Vaccine storage & handling (3 items)	All or none	2	0	6
	Management (7 items)	All or none	2	0	14
	Process Quality	**0-45**			**45**
Ratio	Satisfied clients	0-1	1	0	1

The percent for the mean score of the five facilities where observation of care for clients and exit interviews were done is 70.4% (SD±10.6). Urban health facilities had fulfilled 65.5% of the total while 77.4% by the rural.

Higher structural quality obtained for the rural than urban facilities is also true when comparison done between urban and rural health centers (77.4% vs. 64.5%).

For the case of process quality, an average rate of 50.6% is obtained (SD±14.4). The range is between 27% and 66% (attributes & scores annexed).

Health centers had a percent score of 56.6% and 26.9% for the hospital. Strong measure of statistically significant association is observed between the type of health facility and process quality scores. This implies health centers have a better process quality attributes than hospital [β= 0.913, p=0.03])

A mean client satisfaction rate of 95.5% (SD $\pm$ 3.2) is obtained. The rate is obtained by combining together the percentage of clients who were very satisfied and satisfied. The mean satisfaction rate is 95.5% (Figure 3)

Figure 3: Percent of Mean Scores for Structure, Process Qualities and Satisfaction Rate, Dire Dawa, 2010

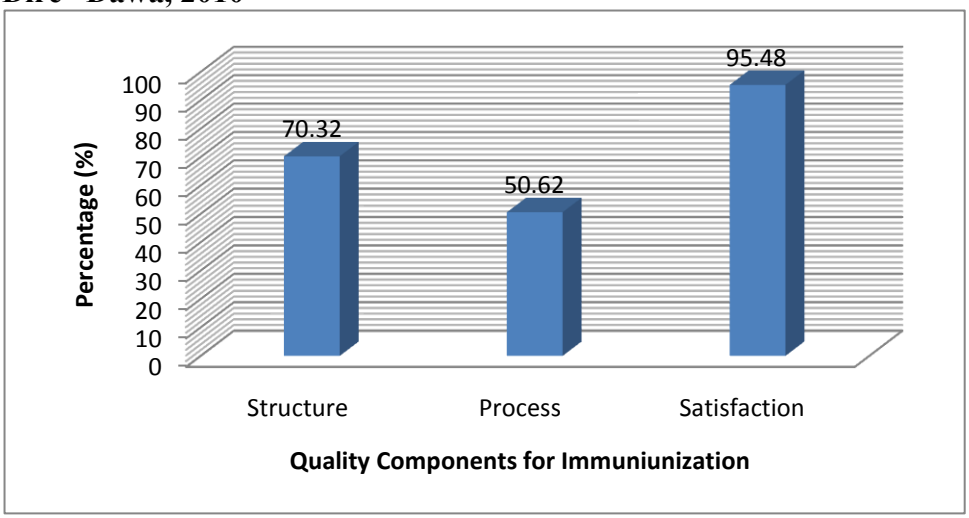


Table 7. Description of Ratios Obtained for the Quality of Immunization, Dire Dawa, 2010.

Name of facility	Structure	Process	Satisfaction
Sabian	0.77	0.66	0.93
Legahare	0.58	0.53	0.98
Wahil	0.71	0.56	0.98
Beyoawale	0.83	0.54	0.98
Dilchora	0.61	0.27	0.91

For the scores shown in table 7 linear regression analysis computed for measuring the existence of association between structural and process qualities; also process and satisfaction rate does not show the existence of significant associations (Table 8).

Table 8. Linear Regression analysis Done between Structural and Process Quality; Process and Satisfaction Rate[b]

Independent	Dependent	β-coefficient	p-value
Structural quality	Process quality	0.58	0.305
Process quality	Satisfaction rate	0.434	0.465

6. Discussion

Growing demand in health care, increasing cost, evidence of variation in clinical practice and shortage of resources are putting emphasis on many countries to look for measuring and improving quality of health care. On the other hand, the structural and process qualities on behalf of the supplier-side that affect client satisfaction will have a major impact on health service utilization without ignoring external confounding factors (33, 34, 35).

Immunization coverage rates respond more to the supply-side than demand effects. Among variables in the supply-side, the availability of resources has a major role in improving coverage rates (27).

In this study, from the resources that were assessed for the program, 100% availability of vaccines in the administration is better than the findings with another study done in Benishangul-Gumuz, north west Ethiopia where they had frequent stock out of vaccines especially BCG for a period of 2-3months (39).

When we look at the condition of refrigerators and the logistics of other supplies, the unavailability of functional refrigerator in only 9% of the facilities has been found better than its occurrence studied in S.Wollo (13%) and Metekale zones (42.9%). In addition to this, the 100% existence of vaccine carrier, icepacks and syringes similar to the findings in Oromia zone of Amhara region can be assumed further opportunity for the program to be in a good position (15, 38).

The same as to the case for vaccines and other supplies mentioned above there was no shortage of recording and reporting formats. At all facilities immunization registration book, reporting and individual follow-up card were available compared to another region of the country with gaps observed in 21.4% of the facilities (38).

Similarly the absences of problems with basic amenities like water, working toilet, telephone in most of the facilities and better structural condition of the service delivery rooms can be assumed as synergetic factors for the betterment of the program.

Although FMOH had developed an EPI guideline and distributed to regions in 2004, no health facility in the region did secure for the current availability as similar as the Mozambique's finding. But in another study done in Metekel Zone of Ethiopia, its availability at 21.4% facilities shows the problem might be either from central level as a result of non-uniform distribution or lack of proper management in the region itself (16, 38).

As it has been mentioned earlier in the program strategy, out-reach method of service delivery is designed as an important way to reach every district complementary to static immunization at the facility. Thus for the out-reach strategy to achieve its goal the availability of resources is indispensible. Among the required resources for its activities finance and transportation can be found (11, 21).

In contrast to the findings in many previous studies done on immunization in this country that came across with deficiency of finance allocated for immunization, the 82% adequacy report by respondents was another encouraging result towards the input. However, the deficit in means of transportation at 28% of the facilities, no matter how it is better than the 55% unavailability in Amhara region of Oromia zone, may hamper progress of the program (15).

Concerning human power aspect, major gaps were observed in the lack of continuous training and inadequate skill. That is nearly half (43%) of the facilities in the administration carry out the service delivery with untrained staffs. From the result of two other studies the proportion of facilities with untrained staffs in Dire Dawa is higher than what it was found in Addis Ababa (27%) and Benshangule-Gumuz where 80% of the staffs working on immunization had not take in-service training (38, 42).

The staffs' quality in provision of the service besides the identified lack of training could also be more compromised by the experience they had. In this study among EPI coordinators the 54% finding of less than one year of working experience can be pointed as threat for the program success. This can be supported from a study done in Pennsylvania where 73% higher coverage was obtained for facilities holding in-service training than facilities with 66% coverage not doing it (43).

Generally, from the summary of the weighted scores for structural quality components indicates health centers by having 73% of the attributes take the leading quality position followed by

hospital (61%) and health posts (58%). Even among health centers the rural with percentage of 77% (mean score of 24) are found at better position than urban health centers (68%). The total mean structural score ratio (0.64) obtained in the region is almost equal as that of studies done in Kenya where a ratio of 0.68 had been obtained (32).

Quality of health care can be measured either from scores given by group of experts or using standards. The latter method is more reliable than use of experts' judgment (21). For this study to assess some part of process qualities the country's standards for immunization service delivery has been used. Among these standards, child that comes for vaccination should be looked for valid contraindication can be found. Severe illness that will not allow the child to go home and HIV/AIDS infection for BCG are among these contraindications (23, 39).

Literatures reveal besides parental, health care providers factors such as knowledge of immunization schedules, contraindications, failure to screen and safety contributed to affect immunization compliance (36). However, any of the clinical encounter screening was observed to be carried out for around two-third (31%) of the children shows the existence of gaps on training and supervision. In hospital, where screening was done more than health center, less than half (48%) of children were screened is also one indication for lack of compliance with standard. Even to the worst there was a facility where very small proportion (10%) of the children had got this service (40, 41).

From studies done both in this country and abroad came with the findings of education or counseling provided to mothers about immunization has significant role in completion of recommended schedules (18, 24, 36). However; this study came with very high degree of shortage towards giving the information in the region.

To start from information told with relatively higher frequency, the observation of about the importance of immunization in general terms to be told for 37% and recommended schedules for 40% of caretakers, implies more than half of the clients did not receive what they should deserve. On the other side, extreme lack of information delivery can be exemplified by for the case of diseases preventable by vaccines and the need to vaccinate at recommended ages in which more than eighty percent of the clients were not told both.

There was also similar or even lower finding obtained with a study conducted in another region of the country where only 0.5% and 24% of the clients received the information about what immunization is and diseases preventable by vaccines respectively (15).

Knowing the possible side effects is assumed to help parents in many ways besides preventing the development of negative attitude towards immunization. Similarly when benefit is told it will either develop or reinforce client commitment to come for the next visits. But only 4% of the caretakers about the possible adverse events (even if it is not as worst as another study result of 1.6%) and 5% the benefits were told indicate that the extent of missed opportunity for educating visitors (15).

Another part of the standard is asking the occurrence of allergic reactions or adverse events related to immunization within 3 days after recent doses of vaccines. With this regard, almost all providers (99%) were not found asking it has something to say about the danger as it was occurred in Bhopal of India where three children died due to OPV administration (43).

Very positive finding obtained in this study is for the case of telling the appointment for the next visit. It was observed to be told for all parents. This might point good performance compared to 24.9% of the Oromia zone of Amhara region study without forgetting the probable communication barriers existing between providers and clients. The 64% of clients who did not say the provider was easy for understanding and the 76% had not allowed to ask questions may put a question mark how much of the told information is received by clients correctly.

Concerning vaccine storage and handling, observation of abnormal storage temperature in 9% facilities had been found far better than the Nianssa province, Mozambique study where 77.8% of the facilities had either high or low storage temperature. On the other hand the display of temperature monitoring chart in all facilities has been found good. However, the observation in its utilization twice a day and throughout the week in 54% of the facilities does not guarantee the maintenance of normal temperature in the remaining 46% facilities (16).

As to the management, the majority (91%) of the facilities knew their target population and up-dating the denominators for each antigen compared to its absence observed in 27% of the facilities in Addis and 42.9% in Metkale. Although this can be assumed an important input for

enabling to monitor their coverage level, the lack of auditing the coverage in 56% of the facilities has a negative impact for the overall administration performance (39, 42).

Supervisory visit from higher level was also low in which 72% of the facilities had not received within six months before the survey as the same as the 30% finding in Mozambique and Addis Ababa (16, 42).

Efforts that only stand confined within health institution may not guarantee to scale up service delivery. Different stakeholders in the community should be involved starting from planning to the end (40). Such that partnership is an important tool to expand immunization services and reach segment of a population that becomes difficult to reach with existing capacity of public facilities. Even though the national EPI has been advocating for formation of strong partnership at local level, from this study its absence for more than half (55%) of the facilities may not enable to utilize the potential service delivery (11, 26).

Discrepancy of immunization coverage reports between surveys and service delivery reports are very common in developing countries. For example, small sample case-studies conducted in Uganda, India and the Philippines indicated reported coverage to exceed survey coverage by over 20%. In contrast to the finding of the studies, the reported coverage for Dire Dawa was found to be lower than the survey where the 2006 national immunization coverage report indicate 31% (using card only) and 61% (card + history) FIC where as the regional report indicates 49%. The survey indicates this administration was at 4^{th} position in its coverage but the annual report by FMOH puts it at 6^{th} position preceded by five regions of the country (3, 6, 41).

In spite of the discrepancies among different report sources, the 61% calculated FIC for the year before this study imply there is still low coverage compared to other regions in Ethiopia. we see the cause of this discrepancy the inaccuracy between recording and reporting besides use of old census projection can be mentioned. However, the average accuracy rate of 93% calculated for our study shows better quality of report than 91% of Addis Ababa's result. From this finding it is possible to estimate the 7% inaccuracy has a minor contribution role for the problem (20, 42).

Studies conducted in Gambia, India and also Ethiopia came across with higher coverage levels in urban than rural areas. In contrast to this, our findings points out rural areas (62%) had better coverage than the urban with 58.1%. Upon assuming major role of community health workers in

expanding immunization coverage the lower coverage for urban can be associated with the absence of health extension workers for urban area (4, 24, 31).

With all deficiencies existing in the service especially with process of care, clients' satisfaction rate of 95% is very high as that of other facility based immunization studies conducted in Ethiopia (98% for West Gojam, Oromia zone 93%) and other countries (96% America). Which may indicate lack of knowledge about the standard clients should have received or as a result of desirability bias (15, 29, 30).

The lower the waiting time the higher the satisfaction result of the study in Saudi Arabia coincides with this study where majority of clients reported short waiting time and technical skill of providers as the sources for their satisfaction.

Many of the researches conducted before have come across the inconsistence association result between either structure and process or process and outcome. But the majority of them have not obtained valid association among either of the two qualities of health care components for hospital unit level analysis. Similarly in our study statistically significant association is not found either between two or all components of quality (22, 34).

7. Limitation and Strength of the Study

7.1 Strengths

- The study tried to assess quality from all of health care components angles
- Calculation of fully immunized children coverage for each health facility
- Utilization of nursing students practicing in immunization as data collectors especially for observation of process of care

7.2 Limitations

- The absence of immunization clients at health posts does not enable to assess the actual process of care delivered and level of clients' satisfaction at health post level
- The unavailability of many quality of care researches on preventive or immunization
- Small number of clients availability at the hospital than used to be in the past
- The absence of standard for some structural quality components in terms of quantity for immunization to rate their adequacy

8. Conclusion and Recommendations

8.1 Conclusion

- Except the gaps on the presence of guideline and shortage of in-service trained staffs the administration had better structure quality on EPI
- Rural health facilities (excluding health posts) had better structural quality than facilities found in urban area
- Performance of facilities in process quality components were found at poor level
- There were major deficit regarding information delivery to clients about immunization, supervision received and compliance with the standard for the process of care
- There was no difference among the three levels of health facility on achievement of target coverage for fully immunized children less than 1 year of age
- Although satisfaction assessment at health facility may not explain the real degree for the situation in the community, the satisfaction rate is high
- The availability of better structural quality can't ensure solely better immunization coverage
- High level of satisfaction rate obtained from our study has not ensured higher immunization coverage
- Poor quality of process has affected the regional immunization coverage
- In spite of better availability of inputs and higher level of clients' satisfaction, the administration is found at low level in its fully immunized children coverage than other regions of the country due to poor level in process quality.

8.2 Recommendations

- EPI manuals or guidelines should be availed at place or room where the service is delivered
- There should be continuous training on EPI and frequent supervision
- There should be strong efforts towards ensuring compliance with the standard of care for immunization

- In order to increase immunization coverage, the existing weak habit of working with local partners should be improved
- Further study should be conducted that will assess the quality of care at health facility and other factors outside the facility for their impact on immunization utilization
- Also there should be a study to see discrepancy of findings for satisfaction rate assessed at the facility and within the community

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Annexes

Annex 1: Checklist for observation of Structure and part of process qualities of EPI, Dire Dawa, 2010.

1. HFs Name_____

2. Type of HF: ☐Hospital ☐Health Center ☐H/post

3. Place where the HF found ☐Urban ☐Rural

4. If it is rural, the community has been served by the HF is:

☐Pastoralists ☐Agrarians ☐Mixed

Date_____/_____/_____

S. N.	**Question**	**1= 'Yes'** **2= 'No'**
	Structural quality components of HF	
1	Does the facility have water?	
2	Is there working toilet in the facility?	
3	Does the immunization room have adequate size for free movement?	
4	Is the room allows entry of adequate light?	
5	Does the room allow circulation of fresh air?	
6	Is there waiting area for immunization clients?	
7	Is there sterile syringe (Ad-syringe) in immunization room?	
8	Is there safety box in immunization room?	
9	Is there vaccine carrier for the facility?	
10	Is there cold box or ice box for the facility?	
11	Is there immunization recording book at service delivery room?	
12	Does the facility have reporting formats (blank)?	

13	Is there child immunization card in the room (blank)?	
14	Does the facility have waiting area for clients?	
15	Does the facility have functional refrigerator for storage of vaccines?	
16	Does the facility have the following vaccines: BCG?	
	DPT-HBV-hib?	
	OPV?	
	Measles?	
17	Does the facility have telephone?	
18	Is there guideline for EPI that deals with Vaccine schedule? Administration technique? Contraindications? Management of adverse events? Vaccine storage and handling?	
	Recording component of HFs	
19	Are tally sheets available in the room?	
20	Do they use it for this day?	
21	Are registers used for recording individual information about child immunizations?	
22	Are individual immunization card records available in the room? (Observe blank cards availability in the room/easily accessible area)	.
23	Does the provider use this card while delivering the service or	

	Updated?	
Vaccine Storage and Handling		
24	Are vaccine receipts recorded in a vaccine ledger book? (Check records in ledger against available stock. (Review date received, issued, balance, expiry & batch no.)	
25	Is the cold chain temperature monitoring chart Availed?	
26	Monitored twice daily including weekends?	
27	Is the normal storage temperature (2-8 degree centigrade) calibrated?	
Reporting component of HFs		
28	Number of children immunized for all doses of vaccine doses in the previous year from recording book:_____ Number of children reported for FIC < 1 year for the same year: _____	
Archiving component of the HF		
29	Can copies of all previous reports from this HF be found in the HF?	
30	Is there one location where the previous immunization reporting & recording forms stored?	
31	Are the immunization registers available for HF?	
32	Is the latest feedback on data from higher level easily available? (the HF receive feedback for the last visit)	
Demographic information component of the HFs		
33	Does the HF Know its catchments area population?	
34	Does it know its target Population (<1 year)?	
35	Are the denominators used in the current year are different from the denominators of previous year?	
36	Is it established independently for different vaccines as needed?	
37	Has the same denominators used on different tabulations (Reports, Chart, Tables, etc)?	

	Full Immunization Coverage in 2001 E.C	
38	Number of children who did take all doses of vaccines: _____ Target children for FIC: _____	
	Evidence of using data for action component of HI level	
39	Does the facility audit for their immunization coverage levels?	
40	Are areas of low access (DPT1 <80 %) identified?	
41	Is there evidence of action taken to deal with it?	
42	Have reason for drop-out rate (>10) been identified?	
43	Is there plan of action to deal with it?	
44	Is there monitoring for HF vaccine stock-outs? (verify from monthly reports or supervision reports any stock-outs)	

Annex 2. Observation checklist for the process of care delivered in immunization room

Health facility Name:_____

Type of Health Facility: 1. 2. Health center 3. Health post

Place the health facility found: 1. Urban 2. Hospital Rural

Date: _____

	Questions	
1	Does the provider screen the child for any of clinical condition?	1. Yes 2. No
2	Does the provider deliver information about:	
	General importance of immunization?	1.Yes 2.No
	Diseases preventable by vaccines?	1.Yes 2.No
	The need to vaccinate at recommended ages?	1.Yes 2.No
	Recommended schedules for immunization?	1.Yes 2.No
	Importance of bringing child card?	1. Yes 2. No

3	Does the provider ask about prior adverse events related to immunization before administering vaccines?	1. Yes 2. No
4	Has the provider told the benefits of today immunization before administering the vaccine?	1. Yes 2. No
5	Has she/he told the possible side effects?	1. Yes 2. No
7	Has all vaccine doses in which the child is eligible been administered?	1. Yes 2. No
8	Does the provider operate a tracking system?	1. Yes 2. No
9	Has the appointment for next visit told?	1. Yes 2. No

Annex 3: Self-administered Questionnaire for Immunization Coordinator or Provider at Health Facility

Name of Health Facility_____

Date_____/_____/_____

Type of Facility/Institution_____

1. Sex of respondent ☐ M ☐ F
2. Age_____
3. What is your profession_____
4. What is your position at the facility_____
5. How much years of experience do you have working on immunization_____
6. Does your facility have money allocated for running EPI?

   ☐Yes ☐ No

7. If yes, is it sufficient for running the program throughout the year?

   ☐Yes ☐No

8. How many staffs are working on immunization in your facility? _____
9. Would you list their profession and their corresponding numbers too? _____
10. Do these staffs adequate to carry out EPI activities for the facility?

    ☐Yes ☐No

11. Does your facility have staff(s) who takes in-service training on EPI within the past 3 years?

    ☐Yes ☐No

12. If yes for Q.11, are they always available in the facility?

    ☐Yes ☐No

13. Does the facility have refrigerator for storage of vaccines? ☐Yes ☐No
14. If yes, is it functional? ☐Yes ☐No
15. Does the facility provide all types of antigen? ☐Yes ☐No
16. Is there sufficient stock of vaccines? ☐Yes ☐No
17. If answer for Q.16 no, what type of antigen is in shortage?

    1) ☐. Measles 2) ☐ Pentavalent 3) ☐OPV 4) ☐BCG

18. Does the facility have sufficient stock of syringes with needles? ☐Yes ☐No

19. Is there sufficient stock of safety boxes? ☐Yes ☐No
20. Does your facility have out-reach sites for immunization? ☐Yes ☐No
21. If yes is the answer for Q.20, do you think are they sufficient to reach every segment of the community under the catchments? ☐Yes ☐No
22. Who is the responsible professional for delivery of outreach?_____
23. If the answer for Q.19 is no, what type of problems can you mention:
    - Shortage of vaccines? ☐Yes ☐No
    - Shortage of supplies like syringes and safety boxes? ☐Yes ☐No
    - Shortage of equipments (vaccine carrier, refrigerator,..) ☐Yes ☐No
    - Transport? ☐Yes ☐No
    - Money? ☐ Yes ☐No
    - Management issues? ☐Yes ☐No
    - Other (specify)_____
24. Does the facility have transport for EPI? ☐Yes ☐No
25. Is there a system for reviewing management/ administrative issues?
    ☐Yes ☐No
26. Is there a system to obtain client opinion on EPI service? ☐Yes ☐No
27. Do you have a routine program on quality monitoring of immunization service? ☐Yes ☐No
28. Have you received a supervisory visit on EPI for the past 6 months?
    1) ☐Yes ☐No
29. Number of providers who receive in-service training for the past 3 years----------
30. Are the following resources for EPI adequate:
    - Human power? ☐Yes ☐No
    - Equipments like refrigerator, vaccine carrier and cold box? ☐Yes ☐No
    - Supplies like syringes and safety box? ☐Yes ☐No
31. Does the facility know its target for under one immunization? ☐Yes ☐No
32. If yes for Q.31, what were your percentages of children immunized against all doses antigens for the previous year?
    Fully immunized children < 1year_____%
33. Do you see the population census to know the target population for routine EPI at each level in this region reliable? ☐Yes ☐No

34. Do you think your facility is properly addressing the issue of IEC on immunization? ☐Yes ☐No
35. List points you think the strengths of EPI performance in your health facility
    ……..
36. Do you think the program is running on the right track to achieve its target in your HI? ☐Yes ☐No
37. Would you think the following problems impede achievements of EPI in your facility:

    Staffs commitment? ☐Yes ☐No

    Community awareness? ☐Yes ☐No

    Other socio-economic factors? ☐Yes ☐No

    Your facility Performance on IEC? ☐Yes ☐No

    Others (specify)……..
38. What should be done to alleviate the problems with immunization or to run the performance in accordance with sated target?

Annex 4: Exit Interview Questionnaire for mothers or caretakers

(This is a guide for interviewer and you must ask for participant consent using the information sheet before proceeding to main body of questions)

Date of interview____/_____/_____

HF Name……

Instruction: Make mark (x) o in the Box for the client response and also fill blank spaces with the answers given

Socio-demographic Characteristics of Mothers /Caretakers

1. Age of mother/care taker in years----------

2. Marital status of the mother /care taker

1) ☐Married 2) ☐Single/never married

3) ☐Divorced 4) ☐Widowed

3. What is the age of child in year? ----------

4. What is your education level?

1) ☐Illiterate 2) ☐attended literacy education

3) ☐From grade 1-6 4) ☐from grade 7-12 5) 12+

5. What is your religion?

1) ☐Orthodox Christian 2) ☐Muslim

3) ☐Protestant 4) ☐other (specify)_____

6. What is your ethnic Origin?

1) ☐Oromo 2) ☐Amhara 3) ☐Somali 4) ☐Other (specify)_____

7. What is your occupation?

1) ☐Government employee 2) ☐Private enterprise employee

3) ☐Merchant 4) ☐House wife 5) ☐Other (specify)_____

8. Ask only those married, what is your spouse's occupation?

1) ☐Government employee 2) ☐Private enterprise employee

3) ☐Agriculture 4) ☐Pastoralist

5)☐ Merchant 6) ☐Daily laborer

7) Other (specify)_____

9. What is the average monthly income of the household?

1)☐ <450 2)☐ 451-800 3)☐ > 800 4)☐ don't know

CLIENT SATISFACTION

13. How do you rate your satisfaction with the way the immunization service provider deliver?

1. ☐ Very Satisfactory 2. ☐ Satisfactory 3. ☐Neutral

4. ☐ Unsatisfactory 5. ☐ Very Unsatisfactory

14. If the answer to question 13 is 1 & 2, what characters of health worker satisfied you?

1. ☐Way of greetings 2. ☐Concern for your problem

3. ☐Information given 4. ☐Other (specify)_____

15. If the answer to question 13 is 4 & 5, why not?

1) ☐The health worker is rude.

2) ☐The health worker is in hurry

3)☐ Had shown no concern of my problem

4) ☐Didn't give any advice/information

5) ☐Other (specify)_____

16. How do you also rate your satisfaction with other immunization services?

1. ☐ Very Satisfactory 2. ☐ Satisfactory 3. ☐Neutral

4. ☐ Unsatisfactory 5. ☐ Very Unsatisfactory

17. If the answer to question to 16 is 1 & 2, which services satisfied you?

(You can have more than one answer)

1) ☐Availability of chair/bench for sitting

2) ☐Waiting time was not long

3) ☐Technical skill of worker

4) ☐The cleanness of the worker

5) ☐Weighing the child and advice on growth and development of the child

6) ☐Screened the child for illness

7) ☐Vaccine preventable disease have decreased

18. If the answer is no to question 4 & 5, which service dissatisfied you?(You can have more than one answer)

1) ☐Waiting time was long

2) ☐Child was not weighed and screened

3) ☐Absence of chair/bench for sitting

4) ☐Technical skill of service provider

5) ☐Child developed abscess

6) ☐Other (specify)_____

19. Did the health worker discuss about immunization with you?

1) ☐Yes 2) ☐No

20. If yes to question 19, what did he/she discuss about immunization?

1) ☐What immunization is?

2) ☐Types of disease preventable by immunization

3) ☐When, how and where vaccines are given

4) ☐Advice on side effect and contraindication of immunization.

5) ☐Appointment of the next session.

6) ☐Other (specify)_____

21. If yes to question 19, when was the information given?

1) ☐During health education session 2) ☐During vaccination session

3) ☐Other (specify)_____

22. If the answer to question 19 is during immunization session, how satisfactory was the session?

1) ☐Very satisfactory 3) ☐unsatisfactory

2) ☐Satisfactory 4) ☐other (specify)_____

23. If the answer to question 19 is satisfactory or very satisfactory, what makes it so?

1) ☐Allowed me to ask question 2) ☐The provider was easy to understand

3) ☐The provider was not in a hurry 4) ☐Other (specify)_____

24. Was the service convenient to you?

1) ☐Yes 2) ☐No 3) ☐Don't know

25. If yes to question 24, what makes it convenient?

1) ☐Opening hours 3) ☐Distance travel

2) ☐Waiting time 4) ☐other (specify)_____

26. A part from health institution, is there any vaccination center or out reach near your village?

1) ☐Yes 2) ☐No 3) ☐I don't know

27. If yes to question 26, why did you come here?

1) ☐Opening hours are convenient here

2) ☐Better quality service

3) ☐To get treatment

4) ☐Prefer provider here

5) ☐Other (specify)_____

28. Have you ever been returned home without getting vaccination during your appointment?

1) ☐Yes 2) ☐No

29. If yes to question 28, what was the reason for not getting vaccination?

1) ☐Vaccine not available 2) ☐Vaccinators were absent

3) ☐Don't know 4) ☐Other (specify)_____

30. How much minutes does it take to reach this health institution from your home? ------

31. What is the average waiting time to get the service?

1) ☐Less than one hour 2) ☐One to two hour hours

3) ☐Greater than two hours 4) ☐Don't know

32 Do you have immunization card of the child with you?

1) ☐Yes 2) ☐No

33. If yes to question 32 did the child receive all the vaccines for which he/she is

eligible for today? (Look at the card)

1) ☐Yes 2) ☐No

34. If no to question 31, do you know any reason why you child did not receive the immunization?

1) ☐Was not told to vaccinate her child

2) ☐Child was severely ill and health worker refused to vaccinate the child

3) ☐Mother refused to get her child vaccinated because her child was ill.

4) ☐Vaccine was not available

5) ☐Other (specify)_____

Annex 5. Attributes and Scores given for Immunization Quality the components

Structural Quality

Physical Infrastructure: the availability of water, toilet, telephone, waiting area, room space allowing free movement, allowing entry of adequate light, allowing fresh circulation of air (out of 7)

Equipments and supplies: the availability of functional refrigerator, vaccine carrier, ice box, auto-disable syringe with needle, safety box (out of 5)

Vaccines: availability of BCG, DPT-HBV-Hib, OPV and measles (out of 4)

Guidelines: availability of immunization written protocols of vaccine schedules, administration techniques, contraindication, management & report of adverse events, vaccines storage and handling (out of 5)

Recording & reporting formats: availability of immunization recording book, reporting formats, individual children immunization follow-up card (3 points)

Human power:

Three and above years of experience working in immunization (2 points)

Any of working staff received in-service training on EPI (2 points)

Finance: adequacy of finance allocated for running immunization works (1 point)

Transport: availability of means of transport for immunization purposes (2 points)

Maximum 31 points

Process Quality

Screening the child for clinical encounter: conducting or observing the presence of illnesses (1 points)

Education provided about immunization: general information told about importance of immunization, vaccine preventable diseases, recommended schedules, the need to vaccinate at recommended ages, importance of bringing child's card while coming for immunization, possible side effects and benefits for the day's vaccines before administering the vaccine (2 points for each)

Questioning prior adverse events: provider asking for the severe allergic reactions within 3 days following most recent vaccine dose before administering the day's vaccine (1 point)

Appointments for next visit telling: appointment for the next date visit being told (3 points)

Politeness, Showing concern and Communication skill i.e. easy to understand & allowed me to ask questions (2 points for each)

Vaccine storage and handling: the presence of temperature monitoring chart, monitoring twice a day including weekends, normal storage temperature (2-8^{o}C)

(2 points for each)

Management

Knowing target population (< 1year), updating denominator for each antigens, auditing for immunization coverage levels, actions taken to deal with identified problems, working together with local partners, supervisory visits conducted for the past 6 months, accuracy of reports (2 points for each)

Maximum 45 points

Outcome

Client satisfaction: percentage of mothers or guardians satisfaction with provider ways of greetings, concern showed, information given in immunization room, clinical care of screening, weighing and advice given, provider's technical skill, waiting area, waiting time

Annex 6. Participant Information Sheet

Addis Ababa University

Medical Faculty

Participant Information Sheet

Hello, I am working as data collector in this research team (project) titled Process Evaluation on the Quality of Routine Immunization services in Dire Dawa.

According to FMOH annual reports, low full immunization coverage has been observed in Dire Dawa administration relative to others regions of Ethiopia for the past 4 consecutive years. It can be assumed many factors may contribute for this incidence.

The purpose of this study is to conduct research for dissertation paper of masters of public health at AAU, Medical faculty, School of public health for assessing the quality of immunization service in Dire Dawa city administration. The interview will take a maximum of 40 minutes.

Data collected from this facility will help responsible parties to identify the weakness and strength of the program to take corrective action in places where there are problems and simultaneously to put effort of strengthening better where there are positive achievements. There will not be any type of risk that may come on you or others up on providing information in this study. All information you give will be kept strictly confidential and your name will never be used in connection with any of the information you tell us. Your participation is voluntary and you are not obliged to answer any questions you don't want to respond.

Contact information:

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Dire Dawa

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Addis Ababa

3. Addis Ababa University Medical Faculty Institutional Review Board

Phone: 0115-538734

Email：aaumfirb@yahoo.com

Addis Ababa

Annex 7. Amharic Version of Participant Information Sheet

አዲስ አበባ ዩኒቨርስቲ

የ ህክምና ፋካልቲ

ለጥናት ተሳታፌ የ ሚቀርብ ሚጃ- ለህፃ ን እናት (ተንከባካቢ) ማጠይቅ

ሠላምእንደምን አደሩ ወይምዋሉ፤ ለዚህ ጥናት የ ሚጃ ሰብሳቢ ነኝ፡ ፡

የ ጥናቱ ርዕስ፡ - ድሬ ደዋ አስተዳደር የ ሚሠጠውን የ ክትባት አገ ልግሎት ጥራት ጥናት ነው፡ ፡

የ መነደርደሪያ ኃሳብ፡ - የ ፌደራል ጠ/ ጥበቃ ሚር በሚ ወጣውዓመታዊ የ ጠ/ ሪፖርት መሠረት ባለፉት አራት አመታት የ ድሬ ደዋ አስተዳደር የ ሞቱ ክትባት ሽፋን ማጠን ከሌሎቹ የ ኢትዮደያ ክልሎች አንዓር አነ ስተኛ መሆኑን ያመላክታል፡ ፡ ይህምበአገ ልግሎቱ የ ጥራት ችግር የ ሚመጣመሆኑን ለመ መት ይቻላል፡ ፡

የ ጥናቱ ዓላማ - ጥናቱ ከአ.አ.ዩ. የ ህክምና ፋካልቲ የ ህብረተሰብ ጠ/ አጠበቅ ት/ቤት ለሚስተርስ ዲግሪ ሚሟ በሚመልከት በድሬ ደዋ አስተዳደር ያለውን የ ክትባት አሠጣጥ ጥራት ለማጥናት ነው፡ ፡ ጥናቱ የ አገ ልግሎቱን ተጠቃሚ የ ሆኑ ወላጆችን የ ሚመለከት ሲሆን ቁጥሩ በአጠቃላይ 472 የ ሆኑ ወላጆች ከአስተዳደሩ ከሚ ኙ ጠ/ ተቋማት በተደለደለው ኮታ መሠረት የ ተፈለገ ውማጠን እስኪሞላ ድረስ ይካተታሉ፡ ፡ በዚህምመሠረት የ ርስዎን እድሜየ ታእና ተያያዥሚጃዎች በአገ ልግሎቱ ላይ የ እርካታ ወይምየ ኢ-እርካታ ማጠንና ለነ ዚህምምንጮቹ ምን እንደሆኑ ሚጃ ይሠጠ ል፡ ፡ ማጠይቁ ከ40 ደቂቃ በላይ አይፈጅም፡ ፡

የ ጥናቱ ጥቅም፡ - ከዚህ ጥናት የ ሚ ኘውሚጃ በአገ ልግሎቱ ላይ ያለውን የ ጥራት ችግር እና ጠንካራ ጎን በማለየ ት ለሚመለከታቸውአካላት የ ማሻሻያ እርምጃ እንዲወስዱያግዛ ል፡ ፡ በዚህ ጥናት በመሳተፎ ለእርስዎ የ ገ ንዘብ ወይም የ ቁሳቁስ ስጦታ አይኖርም፡ ፡

አደጋ ወይምስጋት፡ - በዚህ ጥናት በመሳተፎ ምክንያት እርስዎምሆኑ ሌሎች ለአደጋ የ ሚጋልጥ ሁኔ ታ አይኖርም፡ ፡

የ ሚጃውሚጠራዊነ ት ማጠቅ፡ - የ ሚሠጡ ሚጃ በሞ በጥን ቃቄ በሚስጥርነ ት ይያዛ ል፡ ፡ ስሞምበዚህ ሚጃ መመዝገ ቢያ ላይና ከሚጃውጋር በሚያ ዝ የ ሚይጠቀስ ይሆናል፡ ፡

በጥናቱ የ መሳተፍ እና ያለመሳተፍ መብት፡ - በዚህ ጥናት ላይ የ መሳተፍምይሁን አስፈላጊ ሆኖ ሲያገ ኙት የ ሚቋረጥ መብቶ የ ተጠበቀ ነ ዉ፡ ፡

አድራሻ፤

1. የጥናቱ አድራጊ ስም፡ ዳኜ በልልኝ

ድሬ ደዋ ጠፍ ቢሮ

ሞባይል ቁጥር፡ 0911-026522

የቢሮ ስልክ ቁጥር፡ 0251-112330

ድሬ ደዋ

2. የአማካሪ ስም፡ ዶ/ር ዳመን ኃ/ሚርያም(MD, MPH, PhD)

አ.አ.ዩ. የህክምና ፋኩልቲ የህብረተሰብ ጠፍ ሳይንስ ት/ቤት

ስልክ ቁጥር፡ 0115-157701

አዲስ አበባ

3. አዲስ አበባ ዩኒቨርሲቲ ህክምና ፋኩልቲ ኢንስቲዩቲሽናል ሪቪውቦርድ

ስልክ ቁጥር፡ 0115-538734

ኢ-ሜይል፡ aaumfirb@yahoo.com

አዲስ አበባ

የስምምነት ቅፅ

ከላይ የተጠቀሠውን መጀመሪያ የተረዳሁና በዚህ ጥናት ስሳተፍ የጥናቱን ዓላማ፤ ጥቅም፤ የሚጀመን ሚጠራዊነትና በጥናቱ የመሳተፍና ያለመሳተፍ መቡቴን በሚባ በመንዘብ መሆኑን አረጋርጣለሁ፡፡

የጥናቱ ተሳታፊ ፊርማ.....

ቀን.....

የመጀመሪያ ሰብሳቢ ፊርማ.....

ቀን.....

አድራሻ፤

1. የጥናቱ አድራጊ ስም፡ ዳኜ በልልኝ

ድሬ ደዋ ጠፍ ቢሮ

ሞባይል ቁጥር፡ 0911-026522

የቢሮ ስልክ ቁጥር፡ 0251-112330

ድሬ ደዋ

2. የአማካሪ ስም፡ ዶ/ር ዳመን ኃ/ሚርያም(MD, MPH, PhD)

አ.አ.ዩ. ህክምና ፋኩልቲ የህብረተሰብ ጠፍ ሳይንስ ት/ቤት

ስልክ ቁጥር፡ 0115-157701

አዲስ አበባ

3. አዲስ አበባ ዩኒቨርሲቲ ህክምና ፋኩልቲ ኢንስቲዩቲሽናል ሪቪውቦርድ

ስልክ ቁጥር፡ 0115-538734

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<u>አዲስ አበባ</u>