

ASSESSMENT OF QUALITY OF SERVICE DELIVERY IN  
IMMUNIZATION IN WESTERN GOJJAM,  
AMHARA REGION ETHIOPIA

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Assessment of Quality of Immunization Services

Delivery in Western Gojjam, Amhara Region, Ethiopia

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### **List of abbreviation**

ACHD	- Accelerated Child Health Development
AEFIs	- Adverse events following immunizations
BCG	- Bacillus Callmete Guerine
CHAs	- Community Health Agents
DPT	- Diphtheria-Pertussis- Tetanus
EPI	- Expanded programme on immunization
FGDS	- Focus Group Discussions
FIC	- Fully Immunized Children
IMR	- Infant Mortality Rate
LB	- Life Birth
MCH	- Maternal and Child Health
MMR	- Maternal Mortality Rate
MOH	- Ministry of Health
NNT	- Neonatal Tetanus
SDPs	- Service Delivery Points
TT	- Tetanus Toxoid
UCI	- Universal Child Immunization
UNDP	- United Nations Development Programme
UNICEF	- United Nations Children's Fund
VPDs	- Vaccine preventable diseases
WHO	- World Health Organization
WG	- Western Gojjam

## Summary

Many developed and developing countries have achieved the 1990 UCI target. However, few countries, like Ethiopia, have neither achieved nor maintained it. The coverage in Western Gojjam in 1995\6 for three doses of DPT was below 40%, far below the coverage level expected to bring morbidity and mortality reduction.

A cross-sectional health facility based study to assess the quality of immunization service delivery using qualitative and quantitative methods was conducted from March to May 1997 in 10 districts of Western Gojjam zone. All hospitals and health centres in the zone and randomly selected health stations were included in the study. Exit interview, observations of client-provider interaction, document review, inventory of equipment, interview with service providers, and focus group discussions with service providers and mothers were the techniques utilized.

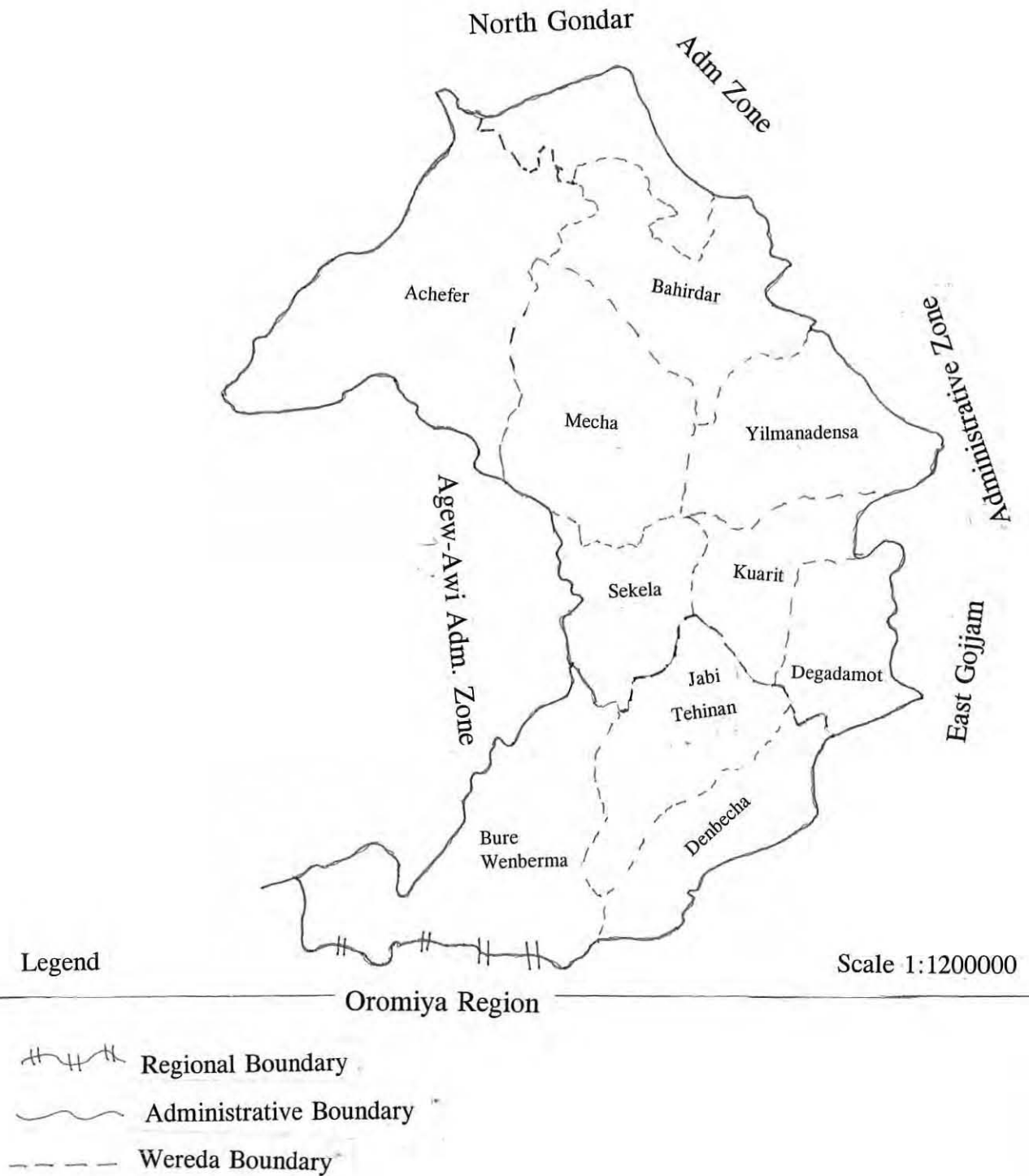
Though the geographical access is satisfactory, vaccine shortage, lack of incentives and transport facilities, delayed replacement of needles and syringes were among the structural factors that affect the quality of service delivery, while poor communication, lack of aseptic procedure, lack of proper screening, weak supervision, and absence of EPI target disease surveillance were weakness in the process of service delivery.

More than 98% satisfaction rate was reported by clients of the service during the exit interview on the dichotomous scale. But the finding was not consistent with the FGDs and the specific items addressed to assess the satisfaction.

Therefore, it is concluded that quality of service delivery in immunization was not satisfactory and hence need improvement to have an effect on coverage and mortality and morbidity reduction targets.

Figure 1.

# WEST GOJJAM ADMINISTRATIVE ZONE ADMINISTRATIVE DIVISION



Source:- Central Statistics Authority

## 1. INTRODUCTION

Immunization is one of the most cost effective and efficient intervention saving the lives of many Millions of children from dying of infectious and preventable diseases. In 1974, WHO launched the expanded programme on immunization (EPI) with the aim of immunizing the world's children against the six major infectious diseases: diphtheria, pertussis, tetanus, tuberculosis, Measles and polio myelitis. The expanded programme on Immunization after its initiation in the 1970s has played a major role in reducing morbidity and mortality related to the vaccine preventable diseases (VPDs) in the world. When the EPI began, fewer than 5% of the world's children were fully immunized. In 1977, when UNICEF set a target of UCI by the year 1990, fewer than 20% of the world's children were fully immunized. Approximately 5 million children a year were dying from vaccine preventable diseases, and half a million a year were crippled by polio (1).

The combined effort of WHO, UNICEF, UNDP, the World Bank, other developmental agencies, and national programmes resulted in the achievement of the global goal of 80% immunization in 1990. After 1990s, global immunization coverage for children under one year of age was maintained at 80% for the recommended three doses of DPT and polio by many countries both from developing and developed nations. However, there is wide disparity among regions, and DPT3 coverage ranged from 91% in East Asia and Pacific to 62% in East Africa and 42% in West and central Africa (2).

Although many developing countries have maintained the coverage, Sub Saharan Africa coverage has declined tremendously as a result of social and political

unrest, civil strife, lack of infrastructures, and financial difficulties (3).

Besides, much of the attention on health services in the developing world has been directed towards the issues of expansion services to meet previously uncovered groups and less attention has been given to the services already provided. Lately, awareness of this problem has increased and the need to let developing countries gain from progress made in quality assurance has been pointed out(4). There is a need to maintain a balance between coverage and quality of services to improve immunization service utilization. A review of existing literature strongly suggests that the quality of services provided is an important determinant of acceptance and compliance with the service and hence is a major contributor to increase coverage. Without significant attention to quality it will be difficult to achieve the goals of the world summit for children endorsed in 1990.

Ethiopia is grouped among the 30 least developed countries and has been facing a chronic food shortage for years due to a series of droughts, poor agricultural practices, deforestation, soil erosion and protracted war (6). Infant and maternal mortality are among the highest in the world (IMR 101/1000 LB; < 5 MR 152/1000 LB; MMR 7000/100,000 LB). As a result, 210,000 infant die before they reach their first birth day; and some 350,000 children die before they are five years old (13).

The immunization coverage in 1988 E.C in W.G is 37% for the three doses of DPT, well far below the 80% coverage required to have an impact in reduction of disease transmission and prevention of death, and is also far below the regional average (67%) of the Amhara region. As a result of the low coverage, it is not uncommon to see epidemics of measles and whooping cough frequently in the zone (annual report of the Zone). In addition, compliance with the service was low (drop-

out rate of more than 30%) in 1995\96 (8).

Quality of the immunization service delivery in Ethiopia in general, and in the West Gojjam in particular, with emphasis to client perception of quality is not assessed and therefore the assessment of the quality of service may fill the gap of knowledge that prevails at present and hence might enable to devise strategies that can contribute to the realization of the goals of the year 2000 endorsed by the 1990 world summit for children. It is hoped that the findings will be useful to the Regional Health Bureau, Zonal Health Department, and District Health offices so as to achieve a better coverage and sustainable service, and ultimately realize the disease reduction and elimination targets.

## **2. LITERATURE REVIEW**

### **2.1 History of Vaccination**

The History of Vaccination goes back to the day of 14<sup>th</sup> may 1796 when Edward Jenner took material from the pustular Lesion on the hand of the milk maid Sarah Nelmes. He inoculated it in to the skin of James Phipps, hoping to protect him from Small Pox which had infected Sarah Nelmes, and the cow in Latin, Vacca- provides the root for our word "vaccination" (9).

Variolation which is deliberate inoculation with small pox virus was practised for Centuries in Africa, China, India and the middle east and this practice was gradually introduced to Europe and America. In fact, people were so afraid of small pox that they practised "inoculation", taking some matter of from a pustule of small pox victim, and placing it in a scratch on the arm of a healthy person in the hope of getting only a mild case even many years before Jenner's practice of vaccination (10). To distinguish his method from "inoculation", Jenner called it vaccination. Subsequent investigation of this phenomenon led to the science of immunology that we know today.

The French Scientist Louis Pasteur, paying homage to Jenner's break through in London in 1881, proposed that the Word "Vaccination" be extended in meaning to cover all forms of active immunization. Thus, we speak of different vaccines even though none of them has anything to do with a cow.

### **2.2 Global EPI Situation**

At the beginning of the expanded programme on immunization (EPI) in the mid 1970s, it was estimated that with every passing minute, 10 died and 10 more disabled because of the lack availability of immunization service (11). Currently,

some 12 million children under 5 die every year, about half of them from acute respiratory infections and diarrhoeal diseases, a fifth from immunizable diseases and malaria. About 2 million children die each year from diseases that are easily prevented by vaccination(12).

By September 1991, the WHO and UNICEF were able to report to the UN secretary General that the goal of immunizing 80% of the World's Children had been achieved. The result of this decade long effort, involving many thousands of individuals and organizations world wide is that over 3 million child deaths and over 400,00 cases of paralytic polio are being prevented each year. Estimated impact of immunization in the developing world has shown that 1.6 million deaths of measles, 0.8 million deaths NNT, 0.6 million deaths of whooping cough, and 0.4 million case of poliomyelitis have been averted (12).

The goal of the year 2000 is to achieve 90% immunization coverage against these six diseases. The goal for mid-decade (1995) is to achieve immunization coverage of 80%, reduce measles cases by 90% and measles deaths by 95%, eradicate polio in selected countries, and eliminate neonatal tetanus.

### **2.3 History of EPI in Ethiopia**

The Ethiopia expanded programme on immunization (EPI) was launched nation wide in 1980 with the assistance of WHO, UNICEF, and UNDP. The goal was to provide immunization to all children under two years of age. In 1986, the target age group was changed to children under one year of age, though children under the age of two are to be immunized whenever they have contact with health institution providing immunization services. The reduction of neonatal tetanus by immunizing pregnant women with two doses of TT was also stressed although all

women of child bearing age are targeted for immunization (14%).

At the beginning (1980), the programme objective was to make immunization services available to 100% of the population and to fully immunize 75% of the total eligible population of the country (under 1 children) by 1990.

However, progress in actual immunization was not as planned as shown by the review of PHC in 1985 by MOH in that the EPI coverage was 16%, though the plan at that point in time was to achieve 50% (15). Following the 1985 review, ACHD was introduced in 1986 to increase immunization coverage by integrating EPI with MCH and this has achieved an increase of coverage from 7% in 1986 to 26% in 1989. Yet, when results were evaluated, though there was some improvement, it was not satisfactory as compared with the plan. In 1990, social mobilization was launched by the help of UNICEF and other donor agencies that resulted in a better coverage (with DPT3 59%). The coverage, however, has declined again to below 20% in 1991. The strategy used in 1990 to improve the coverage was through quarterly registration exercises and follow up on defaulters among children eligible for vaccination; but with the escalation of the civil war in 1990-1991, about half of the existing 1389 static and 4606 out reach immunization sites discontinued rendering EPI services. In 1992, only 53% of static health services were providing immunization services. Consequently, immunization programme stalled and coverage rate dropped. DPT3 coverage, for example, dropped from 59% in 1990 to 12% in 1992 (14). Recent EPI programme review after cessation of the civil war in 1995, had shown that the coverage has increased from 12% to 47% and currently it is reported to be 60% (unpublished report of MOH 1997).

## **2.4 Constraints and Opportunities of EPI in Ethiopia**

Ethiopia has, in the last five years, gone through a national process of restructuring. It has adopted a federal system of government with strong emphasis on strengthening regional governments. To meet this new condition, government bureaucracies (e.g. the MOH) have been completely restructured. Staff responsibilities at the centre and number of staff to carry out these responsibilities, have been radically reduced. At the same time, the number of current and potential partners with the MOH, in the child and maternal immunization effort is growing larger. But, this has exhausted the human resource for EPI programme at MOH and activities are being hampered at the centre. A very encouraging beginning has been made, already to improve planning at zonal level, through the UNICEF initiated and supported micro-planning process. Despite these strengths, the 1995 National review had shown quality assurance to be minimal, very weak supervision of programmes and poor surveillance of EPI target diseases (6).

Studies done in Wolliso, western Shoa to find out the reasons for the low coverage of EPI service have revealed many factors to be associated with. For instance, lack of education, place of immunization inconvenient and lack of time by mother were the main reasons for defaulting and not immunizing their children. Besides, missed opportunities and lack of community participation were accounted for low coverage (16). Studies of immunization coverage and associated factors in North Eastern Arsi, Ethiopia had shown that better educational status of mothers and daily EPI sessions were associated with increase in coverage (17). Defaulter rate of 25% in Ketenna 2, Addis Ababa, was found to be mainly due to lack of education of mothers (18).

## 2.5 Quality of Health Service Delivery

The quality of health service has been a subject of resource and controversy for many years. It has been considered by some to be intangible and undefinable and others consider it measurable in certain aspect and elusive in others. In any event, the large amount of literature that has accumulated on health care quality has been oriented almost entirely to the problem of clinical medicine. Relatively little work has been done in public health programme in general and PHC in particular. (24)

The principles and techniques of quality assurance were formulated in the 1950 by W. Edwards Deming, an American Management expert, using ideas of Walter Shewart from the 1930s (20).

Assessment of the quality of service delivery in health facilities is receiving growing recognition as a strategy for monitoring and evaluating primary health care programme in developing countries (24).

Under a simple inspection based system, quality of service delivery is a process of ensuring that conforming service are delivered to the customer, or services or activities are assessed and then compared with specified requirement to assess conformity (21).

Quality as conformance to requirement is frequently misunderstood to mean purely conformance to specification. Crosby believes that conformance to requirement is conformance to both specification and customer needs (22).

Quality as perceived by the recipient is critical to the complete definition of quality of service delivery. Quality of service delivery consists of two interdependent parts: Quality in fact and quality in perception. The first involves meeting one's own

specification (conformance to standards), and the second part is meeting the expectation of one's customer. Clients often evaluate qualities of service delivery in health service in terms of the factors such as staff courtesy, degree of concern, cleanliness, promptness or timeliness in getting services (23).

Roemer and Montoya defined quality as the degree to which resources for health care or the services included in health care correspond to a specified standard (24).

There are two elements in the performance of service provider: the technical skill and the interpersonal skill. Technical skill depends on the knowledge and is judged in comparison with the best in practice (standard). The interpersonal skill is the use in which service provider communicates information necessary for effective service; but this skill should meet social and individual expectations and standards. Those standards, if applied, are generally expected to lead to desired results(25).

There are several theories that attempt to explain how clients evaluate the quality of health service delivery. The first theory states that there are two sides to the customer's perception of service quality. First, the primary or "core" service is performed, and second, that the surrounding or secondary services are performed satisfactorily. This theory holds that if primary function is not performed satisfactorily, it can not be recovered by high performance level in the secondary function. The second theory states that the primary function can be influenced by the manner in which the service is performed, but the effect of poor interaction with the service providers can not be over come by competent performance (23).

Very often, in health service, clients generally expect competent and professionally trained workers who will follow the properly procedures in their work.

But except few clients who are familiar with the working of a hospital, most clients do not know what constitutes a "proper procedure" and what clients do know and can respond to is the manner in which a service is performed (for example, the behaviour of individuals providing the service). Therefore, it is essential that both the hard functions (technical activities) and the soft functions (interpersonal activities) have to be assessed to come up with a valid assessment of quality of service delivery.

There are three levels at which quality of service can be assessed: the structure, the process, and the outcome (25, 4,24). The structure denotes the attribute of the setting in which health care occurs (equipment, facilities, supplies, and human resources). The process denotes what is technically done in giving care, while the out come is the effect of care or the impact of the service and the degree of client satisfaction.

## **2.5 Quality of Immunization Service Delivery**

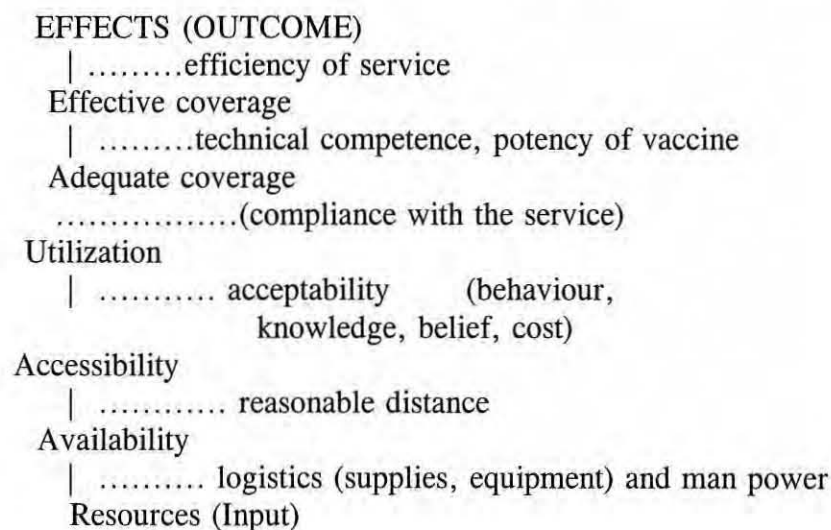
One of the goals of the last two decades has been to reach all of the children with immunization service. Now, EPI is placing emphasis on the quality of immunization service delivery (27, 26).

Both EPI and CDD programmes of the World Health Organization (WHO) have developed observation based assessment for quality of service delivery in routine use (26). Since 1986, ministries of health in 11 African countries have applied the method and was found to be reliable and valid. The method includes: observation of health worker personnel, interview with health workers and clients, document review and inventory essential equipment and supplies at health facilities.

Quality of immunization service delivery is the suitability for providing the programmed service in a reliable manner. It is indicated by training, skills,

knowledge, attitude, behaviour, safety of equipment, adequacy of supplies and of equipment found in them (28). The requirement for better quality of immunization service includes good management of cold chain, technical competence, sterility of equipments, access to service, good information, surveillance of target diseases, and proper follow up and screening of eligibles at vaccination centres. Besides, it includes the humanistic dimensions of personal, social and cultural acceptability and of compliance with ethical norms. It is the conformance of health workers to these requirement that determine whether quality of service is provided or not. Quality assessment will not only show the accomplishment of a programme in relation to the standard, but it may also suggest the points of difficulties (bottle necks) in the chain of services (29,24). By using the coverage model as described by Tanahashi (28) we can link the determinants of quality of services. These relationships can identify problem areas to be addressed for corrective action, by showing where the bottlenecks in the achievement of effective coverage are located.

The following scheme shows some likely problems associated with each possible bottle neck in the relationship between the determinants.



Availability, accessibility, and utilization are essential elements of quality of service. The argument is if in an area services are not available or accessible or not utilized by the people the quality is rated as zero (24).

Problems of quality of immunization service delivery can be due to quantity and range (which indicates coverage and utilization), technical aspect, and human relations. These three problems are interrelated to one another. Accessibility affects effectiveness and hence quality of service. On the other hand, under utilization and lack of coverage may be due to problems of quality. Studies done by Ekunwe O. and Scott Samuel(30,31) have shown that problems in health service organization are the main causes of low EPI coverage. Besides, Galazka A.M, (31) have indicated that the major constraints to the delivery of effective immunization service in developing countries is the lack of staff, supplies, equipment and the reluctance of health workers to vaccinate sick children. Henderson R.H. (32) indicated that with better health education and follow up, the majority of world children could be fully immunized using the existing staffs and health facilities. Studies done in Thailand by Limtragool P.(33) have shown that health workers' knowledge of infectious disease and their frequent contact with mothers contributed to high coverage (neither distance nor socio-economic status correlated with increased coverage).

Poor quality of service, with its resulting consumer dissatisfaction increases drop out rates and under utilization (34). Poor quality of immunization service delivery may be due to the use of spoiled vaccines, incorrect administration of vaccines, poor client-provider interaction, improper sterility of needles and syringe, poor education, poor recording and reporting, and poor follow up and supervision.

poor education, poor recording and reporting, and poor follow up and supervision.

Apart from the technical problems, however, there are doubts about the validity of concept of satisfaction criteria used to assess satisfaction. This is because the criteria usually used were based on the providers assumption rather than the client value and expectations (35). In addition, clients may have a complex set of important and relevant beliefs which can not be embodied in terms of expression of satisfaction (5).

The reporting of AEFIs (adverse events following immunizations) increased in 1995, and this has increased doubts about the quality of immunization service delivery in some area. Many of these AEFIs are caused by "program errors" such as improper handling of vaccines or faulty immunization techniques (27). In developing countries the most common cause of vaccine related side effect is human error-either in storage, reconstitution, administration, or sterility technique problems (36). Similarly, analysis of five children who suffered sever reactions after immunization with measles vaccine and died from toxic shock syndrome despite hospital treatment showed that vials of reconstituted measles vaccine were being saved and reused instead of being discarded at the end of each session (36).

In 1994, WHO reported that survey carried out in four of its six regions indicated that up to a third of immunization injections were unsterile and therefore unsafe (37). Immunization injections are only safe when the correct vaccine is properly administered with sterile equipment and subsequently safely disposed of. Unsafe injection can result in infectious and noninfectious complications (37).

Although some aspect of quality is assessed like status of missed opportunities, programme management and compliance, none of the previous studies in Ethiopia

have dealt with technical competence, interpersonal relationship with clients and degree of satisfaction of clients which are important component of quality and hence are expected to improve coverage through better compliance with the service and at the same time satisfied clients will generate demand in the community and assist in the recruitment of new clients who can use the service (19). Besides the socio-cultural factors such as lack of education, traditional beliefs, long distance to travel, being busy, quality of service of immunization is also equally important for increased coverage of service and programme sustainability as documented in a number of studies elsewhere and hence need to be investigated.

### **3. OBJECTIVES**

#### **3.1 General Objective:**

To assess the quality of immunization service delivery and programme management in Western Gojjam Zone

#### **3.2 Specific Objectives:**

1. To assess the knowledge and performance of immunization service providers
2. To assess the utilization of and compliance to immunization service by mothers and care-takers
3. To assess client-provider interaction in immunization service
4. To assess client satisfaction with the service
5. To assess the availability, functionality and adequacy of logistics supplies and facilities for programme at service sites.

## **4. SUBJECTS AND METHODS**

### **4.1 Study design:**

A descriptive, cross-sectional study using structured questionnaires, adapted from WHO training modules, WHO EPI review questionnaires, and the health facility based assessment (FBA) method developed by EPI and CDD programmes of the world health organization (WHO) was utilized to assess the quality of service delivery in immunization at randomly selected health institutions which provide immunization in Western Gojjam Zone, Amhara Region.

This was supplemented by focus group discussions conducted in two health centres and two hospitals for both mothers or care takers of less than 2 years old children and health workers.

### **4.2 Study Area**

Western Gojjam, one of the eleventh zones in Amhara region , has a total population of 1,771,073 with a male to female ratio of 103:100. Children less than one year old comprise 3.4% (60761) while women of child bearing age make up 21% (371926) of the total population. Administratively, Western Gojjam Zone consists of 10 districts.

### **4.3 Population and Sampling**

All health institutions in Western Gojjam Zone delivering immunization services were used as the source population. There were two hospitals, four health centres, and (fifty) health stations which are owned by government. Six health stations were excluded from the study as they were reported to be not delivering immunization service.

Health institutions which provide immunization service were stratified to hospitals, health centres, and health stations. The two hospitals and all health centres(4) were included in the study.

Simple random sampling, using lottery method was used to select 10 of the remaining 44 health stations delivering immunization services after stratifying them by district and by selecting one from each district. The sample size was fixed at two hospitals, four health centres, and 10 health stations (one from each district) considering the time available, human resource, and other logistics to complete the research in the specified period. All mothers (care takers) of less than 2 years old children who attended the selected health institution during the data collection, and health workers involved in immunization service were included in the study for interview.

#### **4.4 Data Collection and Management**

Data collectors were recruited from health institutions out side Western Gojjam zone to avoid bias that can result from their previous knowledge on the service delivery. Data collectors were health workers who had previous training in Mid Level EPI Management. The data collection instruments used were:

1. Structured questionnaire for exit interview of mothers of under 2 years old children.
2. Structured interview questionnaire for health workers providing immunization service.
3. Structured checklist for none participatory, direct observation of client-provider interaction

4. Checklist for inventory of logistics and assessment of facilities in immunization service
5. Checklist for document and record review
6. Topic guide for FGDs (Focus group discussion)

For 10 groups of mothers of less than 2 year old children, and 6 groups of health workers. The questionnaires and checklist formats were first translated to Amharic (the local language) and back translated to English to assure consistency.

A one week training was given to data collectors by the principal investigator. This was followed by pretesting the instruments in two health stations out side Western Gojjam zone. The data was collected by a team consisting of five members including the principal investigator.

FGD guide was developed (appendix-) to determine mother's perception and attitude towards immunization and to complement the findings of the survey. All focus group discussions were moderated by the principal investigator and the same recorder was used through out the study time. All participants were mothers (care takers) of under 2 years old children in one group and health workers consisted of health assistant and nurses who are involved in immunization in the other group. Four groups of health workers and seven groups of mothers were enrolled in the focus group discussion. Since the number of health workers in health stations was too few to conduct focus group discussion, FGD was carried out only for mothers in four of the sampled health stations. While in one hospital and two health centers, FGD was carried out for both mothers and health workers. The group discussion was transcribed in Amharic, fully translated in English and analyzed.

In exit interview, clients were asked about their satisfaction with the service

and manner of service providers, the kind of information given, the service convenience, and whether they were properly screened and received the service they deserve. Service providers were also asked about their training, knowledge on the service, and practices of service delivery. During record review, coverage, EPI monitoring charts, reporting and the presence and functionality of the different formats were investigated. Interviewers used visual inspection to assess the availability, functionality, and adequacy of equipment and supplies needed to provide effective immunization services.

Data processing and analysis of the quantitative data were carried out using EPI-INFO (version 6) statistical software package. Descriptive statistics, was utilized to present data. The qualitative information was sorted and assembled manually and presented in a summarized way keeping interesting expressions as explicit as possible.

#### **4.5 Operational Definitions**

Geographic coverage or access to immunization: This refers to the area and eligible population who are found within 5 kms radius (MOH, EPI guideline).

Vaccine stock outs: The absence of any one of the six vaccines at any time in the health institutions (MOH, training guide).

Adequacy of logistics and supplies: The presence of equipments and supplies that are sufficient enough to carry out the programme effectively as reported by service providers (MOH, training guide).

Surveillance: The collection of data about the cases of the target disease and the use of data to improve actions to prevent these diseases.

Utilization: The percentage of under one children who received the first dose of

DPT1 (WHO, guideline).

Compliance: The percentage of under one children who had DPT1 and completed DPT3 (WHO guideline).

Missed opportunity: Failure to immunize eligible children who visited health institution in the absence of contraindication or refusal of the mother (WHO guideline).

Supplies and logistics: Items necessary for vaccination that include transport, cold chain equipment, kerosine, needles, syringes and other formats for reporting (MOH, training guide).

Knowledge of immunization: The information the service provider has regarding dose, interval of doses, route of administration and the age of commencement of the different antigens (as per the national and WHO training module).

Performance of immunization service: The skill that the health worker has regarding storage, handling, and administration of vaccines to eligible children and mothers in accordance to the specified standard (as per the national and WHO guidelines).

#### **4.6 Ethical Consideration**

Ethical clearance was obtained from the ethical committee of the department of community health before planning for data collection. All clients who are eligible for the study agreed for interview after the aim of the study was clearly described by the research assistants. There was no refusal to participate either in the interview or the direct none participatory observation (both service providers and clients).

After informed consent was obtained from all the study subjects, data collection was started and eligible children who were found to be un immunized at the exit gate were informed about the service and directed for vaccination if volunteered.

## **5. RESULTS**

The findings of this study are presented in four major parts. The first part provides information on service delivery points (health care facilities) and client characteristics. The second part deals with the processes of immunization service delivery, the third part deals with the out come of the immunization service delivery and the last part deals with the findings of the focus group discussions.

### **5.1 Health Institution and Client Characteristics**

A total of 580 mothers/care-takers were enrolled in the exit interview aimed at assessing service satisfaction. Fifty (50) health workers were included in the interview aimed at assessing their knowledge and practice about the service. knowledge and practice on the service. Observations were also made on 401 client-provider interactions during service delivery.

Analysis of the socio-demographic characteristics of the 580 mothers (table 1) showed that the age of immunization clients ranged from 15 years to 50 years and the mean age was 25 years. Eighty nine percent of the mothers were married, while 51% were not educated. Most of the mothers were Orthodox Christians (91%), Amhara by ethnicity (97%), and house wives (80%).

Table 1. Socio-Demographic Characteristics of Mothers/caretakers/ of under 2 children, Western Gojjam. May 1997 (N = 580)

Characteristics	Number	Percent
<b>Age group</b>		
15-19	69	11.9
20-24	212	36.6
25-29	164	28.3
30-34	89	15.3
35-39	33	5.7
40-45	11	1.9
> 45	2	.3
<b>Martial Status</b>		
Married	516	89
divorced	33	5.7
Single/not married/	19	3.3
others	12	2
<b>Educational status</b>		
Illiterate	295	50.8
Educated	233	40.2
Literacy training	52	9
<b>Religion</b>		
Orthodox	530	91.3
Muslim	46	7.9
Other	4	.8
<b>Occupation of mothers</b>		
house wife	466	80.3
government employee	29	5
student	16	2.8
others	69	11.9
<b>Husband occupation</b>		
farmer	165	28.4
government employee	142	24.5
merchant	93	16
others	116	31.1

## 5.2 Logistics and Supplies

In 25% of the health institutions, one or more vaccines were found to be out of stock during the research team visit while 52% had reported stock outs for one or more vaccines in the last one year. All hospitals and three of the health centres had up-to-date vaccine control card and a knowledge of minimum and maximum vaccine stock levels. On the other hand, only two of the ten health stations had up-to-date stock cards. At least one or more refrigerator was available in all institutions. However, 5 units reported that the refrigerator/s they have was inadequate and two units had none functional refrigerators during the visit. While vaccine carriers were available in all of the SDPs (health institutions), they were not adequate in 5 of them and cold boxes were not available in 3 of the health institutions. Inspection of functional refrigerators revealed a regular temperature (twice per day) recording, proper arrangement of vaccines, and in all of them there were neither open vaccine vials nor were expired vaccines. More than half of the institutions use kerosine as main source of power; of these, nearly 50% complained kerosine shortage. Shortage of one or more cold chain spare parts was reported by 10 (62.5) of the health institutions.

Separate immunization room, with chairs and tables, was not available in almost all health stations. Three health stations did not have functional weighing scale, and 6 health stations did not have adequate immunization cards. Hospitals and health centres had better access to separate room with chairs and tables, functional weighing scale, and immunization card than did health stations. All health institutions had adequate immunization registration books and tally sheets.

When sterilization equipments and syringes with needles were inspected, steam sterilizer was available in all except in one health station, where it was not functioning properly. Reusable syringes and needles were reported to be inadequate in 6 (37.5%) health institutions and were used for more than a year in most health institution and in some they have used it for about two years. As a result, needles in most health institution were observed to be blunted and hooked from frequent resharpening. Time clock was not available in 6(37.5%) health institutions, and forceps were not available in 2 health institutions.

### **5.3 Staffing Pattern, Transport Facilities and Budget**

In almost all health institutions immunization is provided by health assistants. But the number was observed and reported to be inadequate in most health stations. One or more functional motor cycles were available in 6 (3 health stations and 3 health centres) of the health institutions and functional car were available in 6 (4 health centres and 2 hospitals) of the health institutions.

Vehicles breakage was reported to be on an average every 3 months. Budget for vehicle maintenance and per diem for field work were insufficient in all institutions.

### **5.4 The Processes of Service Delivery**

#### **5.4.1 Access, Utilization, Information and Communication**

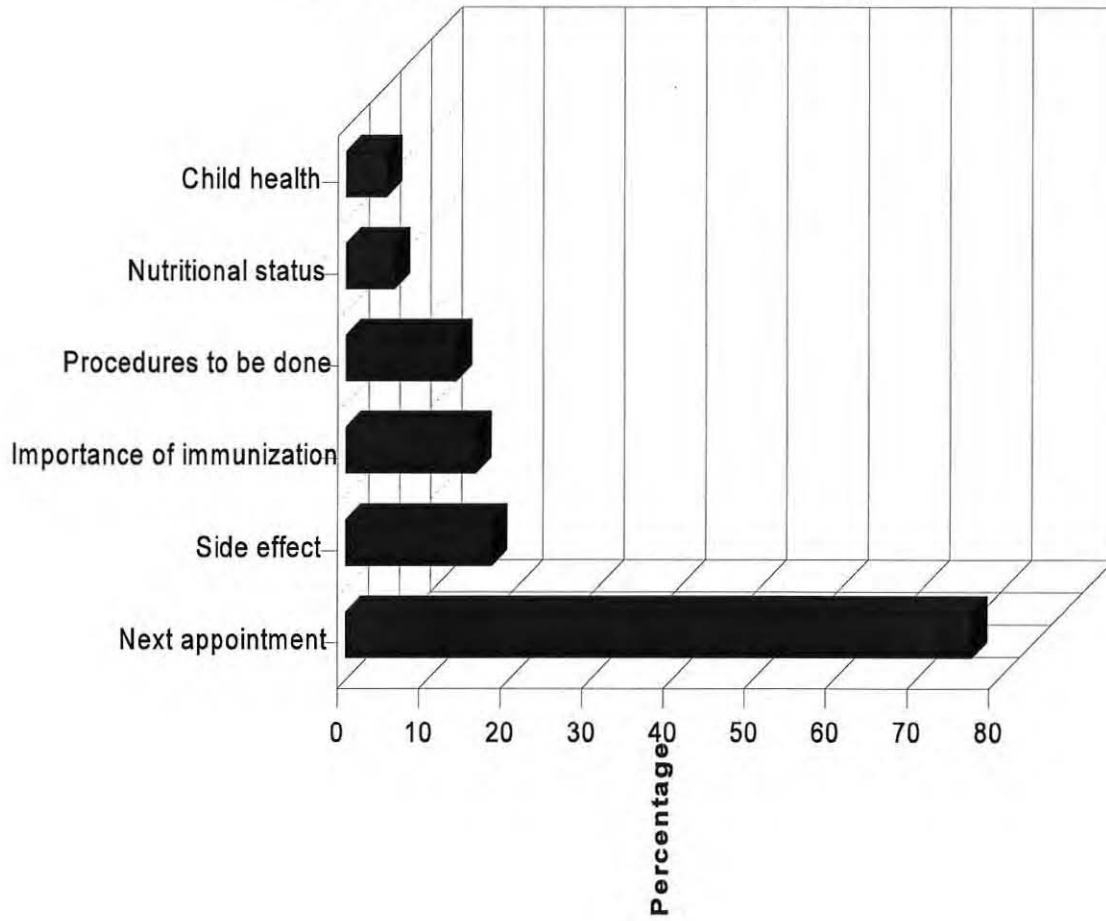
The optimal geographical access rate (SDPs within 5km radius using both static and out reach SDPs) varies from 14% to 100%, with an average of 75%. On the other hand, utilization which is the measure of acceptability of the service (measured in terms of DPT1 or the use of service at least once) is, on the average, less than fifty percent. Exit interview with mothers revealed that the majority (90%)

judged that the service is located at a convenient walking distance from their home, while waiting time and opening hours were judged to be not convenient as only 165 (32%) and 85 (16%) of the mothers reported the waiting time and opening hours to be convenient respectively.

A total of 401 client-providers were observed during the communication between the clients and service providers. Only 7(1.7%) of the client-provider encounters were judged to be received by friendly greetings.

Discussions were observed to be made regarding the problems of the child in 20(5%); child nutrition in 27(6%); procedures to be done in 54(13.6); importance of immunization in 66(16%); possible side effect and what to do when it occurs in 71(18%). Though next appointments of clients were observed to be discussed most frequently in 77%, the information was not specific with regard to the date of return and the reason for return (see figure 2 ).

**Fig. 2 Issues discussed between the caretakers & health workers (n= 401)**



#### **5.4.2 Immunization Provider's Knowledge and Practice**

Thirty four (68%) of immunization service providers were trained in peripheral level EPI training, 2(4%) in mid level EPI training, 10(20%) in cold chain management, and 9(18%) in motorcycle riding. Most of those who had the training in one or the other acknowledged that the training was sufficient to enable them perform their duties effectively.

All health workers had correct knowledge on the dose for each antigen, route of administration, recommended age of vaccination, and the interval between successive sessions. All the service providers knew the recommended temperature for the storage of vaccines (0-8C) and the vaccines that can easily be damaged by exposure to low temperature; but the maximum time that vaccine can stay in the refrigerator during cold chain break is not correctly known by 46 (92%) of the service providers.

Few service providers, 3(6%), have correctly identified the contraindications. Though 84% of immunization providers claimed that they regularly screen mothers and children for vaccination status; none of the health institution were observed screening children by verifying names in the registration books in those who did not have cards at their disposal.

Observation made during the vaccination session revealed that in all vaccines are put in a correct place (in ice cube or on ice packs), in 68% forceps were used to pick up needles and syringes, in 81% single needle and syringes were used for each child, and in 80% injection site was cleaned using hot water swab. Twenty eight percent of providers were observed to shook the DPT and TT vials before use, and

58% of the time have done the procedure with strict aseptic procedures.

#### **5.4.3. Reporting and Monitoring of Service Delivery**

Monthly reporting was observed to be done in all of the health institutions surveyed. However, none of them had a adequate reporting formats. Formats used for temperature monitoring (EPI 9), vaccine balance (EPI 11), and antigen reporting(EPI 13 and EPI 15) are widely available. Reports were observed to be complete and well documented in all health institution; however, no feedback was received on the reports in all the health institution surveyed.

Disease surveillance is none existent in all health institutions. Seventy percent of the health institutions reported to have a mechanism to trace defaulters through home visit made by health workers, CHAs and or kebele officials.

Eighty percent of the health institution have never been supervised by any body in the last quarter prior to this study. EPI monitoring chart was found for all antigens in only 1 of them and this one health institution has not taken any action in accordance to the result of the monitoring chart.

#### **5.4.4 Missed Opportunity Status**

Of all the children under 2 years of age who visited the surveyed health institutions, 411(71%) had immunization cards and 182(31%) of their mothers had also their own TT immunization card. Of those who did not have cards during the exit interview, 119(70.4%) claimed to have completed the vaccination schedule but left the card at home and 50(29.6%) have not yet started because they were not made aware of the service. On the other hand among the 411 mothers who have immunization card, 371 (90.5%) have received the antigen for which they are eligible; and the rest who are not immunized reported lack of information by 9

(22.5%) mothers, vaccine not available by 29(72.5%) mothers, health worker's falsely impose contraindication by 1(2.5%) mother and, 1(2.5%) refused to get her child vaccinated. Reasons for missed opportunity are organized in Figure 3. The overall missed opportunity rate is 15% for children, and the missed opportunity rate for mothers is 68% (see figure 3).

## **5.5 Out Come of Service Delivery**

### **5.5.1 Client Satisfaction with service delivery**

Five hundred sixty three (97%) clients said they were satisfied with the reception of health workers. Table 2 summarizes the characteristics of the service provider that satisfied them and 98% of the mothers were satisfied with the service provided Table 3 summarizes the service characteristics that satisfied the clients.

**REASONS GIVEN FOR MISSED OPPORTUNITY OF  
IMMUNIZATION BY INTERVIEWED CARE TAKERS,  
WEST GOJJAM, 1997 (N=89)**

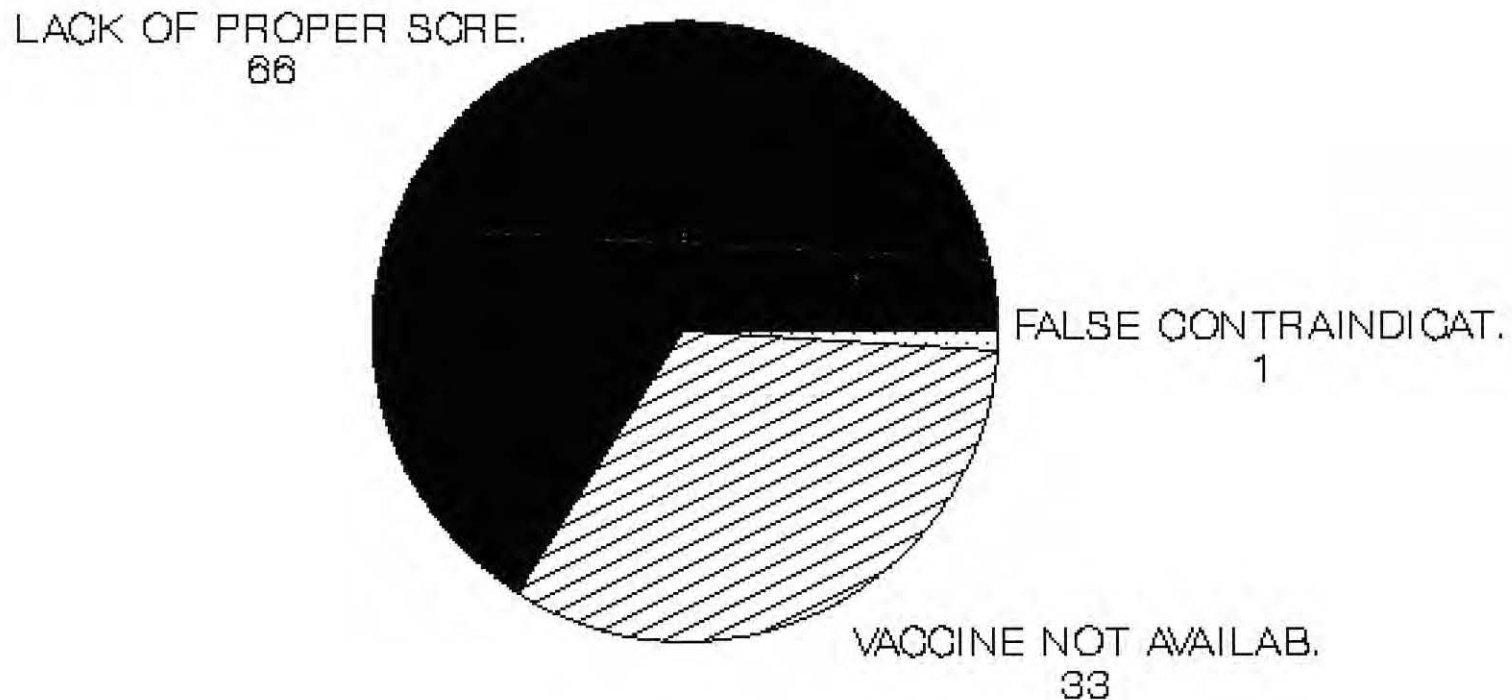


FIGURE 3

**THE PERCENTAGE OF MISSED OPPORTUNITY  
FOR CHILDREN OF <1 CHILDREN**

Table 2      Reasons for client judgement satisfaction pertaining to the behaviour  
of immunization providers Western Gojjam, Ethiopia, May 1997

Reported reasons	Number(n=563)	%
Informativeness	363	64.5
Humanness/Empathy	15	2.6
Co-operation (concern for clients problem)	142	25.2
Ways of greeting	137	24.3

NB the percentages do not add to 100% because of the multiple response given by the interviewee

Table 3. Reasons for client satisfaction judgement on immunization services  
W.G, Ethiopia May 1997

Service Characteristics	Number(N = 569)	%
Competence of providers	54	9.5
Hygienic work/safety	25	4.4
Availability of chairs and benches for sitting	301	53
Effectiveness (outcome of service)	345	61
Weighing and Screening of Children for illness	23	4
Timeliness	47	8.3

NB the percentages do not add to 100% because of the multiple response of the interviewee.

### 5.5.2 EPI Coverage

There were a total of 16 static and 140 out reach sites providing immunization (the number of out reach per health institution varies from 0-16). The percentage of target population who received the full course of immunization (FIC) is 26% in the sampled health institution; and those who have received the three doses of DPT is 33%. The coverage rates of each health institution by different antigens in 1995/96 is organized in table 4. The drop-out rates between DPT1 and DPT3 ranges from 0% to 65% with an average of 26%. The coverage rates are taken from the routine report of each health institution in 1995\96 and their reliability is questionable as 0 % drop out rate is very difficult to believe and besides, denominator is not clearly demarcated or known to service providers specially in areas where there are health centres and hospitals in the same town. Most of the health institutions have DPT3 coverage less than 40% as seen in Figure 4. Similar coverage levels were observed across different health institution when weighted immunization coverage for DPT3 was considered (see Figure 5).

# DPT3 IMMUNIZATION COVERAGE BY NUMBER OF HEALTH INSTITUTIONS

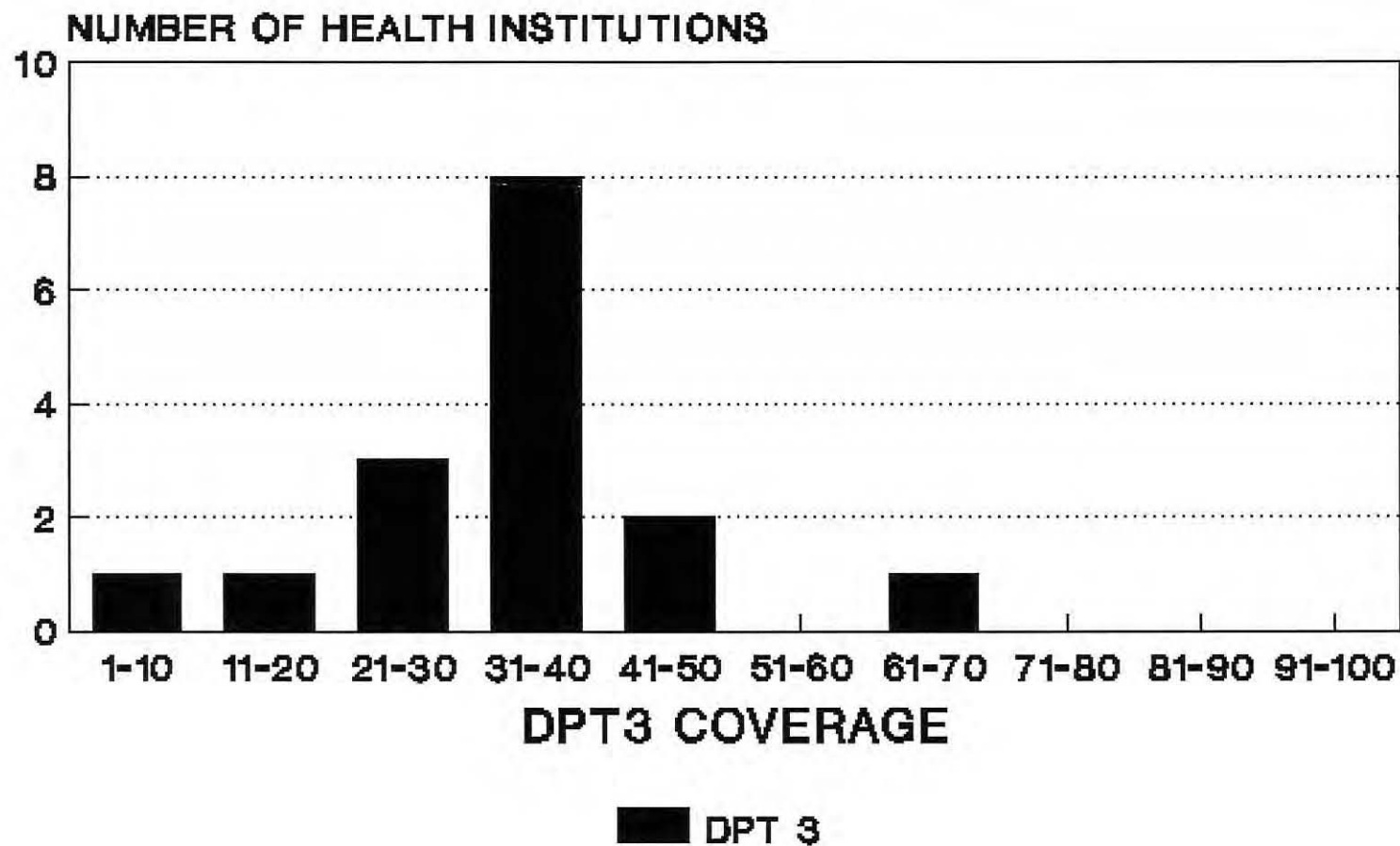


FIGURE 4

# WEIGHTED IMMUNIZATION COVERAGE BY TYPE OF HEALTH FACILITY

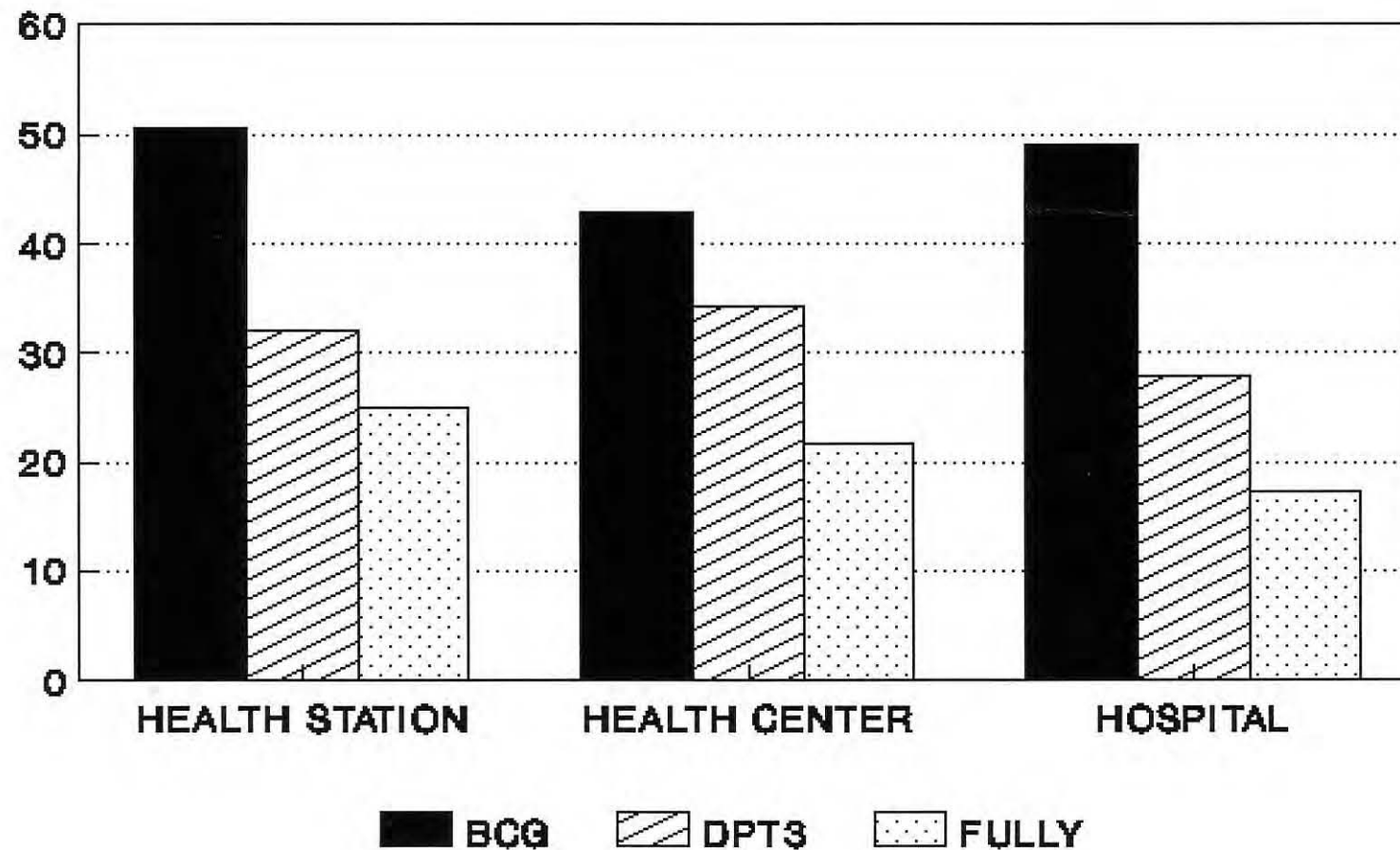


FIGURE 5

## **5.6 Findings of Focus group discussions with Mothers**

Seven focus group discussion for mothers and four group discussion for health workers were conducted. The method for the selection of the participants was purposive sampling. 8-10 mothers participated in the FGD. The total number of mothers involved in the FGDs were 63. Their age ranged from 15-50. Details of the results are presented in narrative and summary form (tables 6 and 7).

### **5.6.1 Mother's View on Immunization**

All mothers who participated in the focus group valued immunization as "helpful" or "beneficial" in that it protects their children from diseases. Almost in all sessions, mothers said that immunization protects children against measles and pertussis; however, some mothers reported that immunization is useful as it prevents against other disease besides pertussis and measles. For instance, one group member said "immunization protects our children from diarrhoea, meningitis and tetanus", while another women said that "immunization protects children from common cold and it protects mothers from tetanus and colicky pain during child delivery". Besides, one participant from a town said "immunization protects children from measles, polio, tetanus, pertussis and kwashiorkor". One discussant from rural area noted "I have seen children who are immunized, in my village, being protected when epidemics of measles occurred last year", and other have supported her experience with theirs.

When the focus group participants discussed why some mothers failed to bring their children for immunization, most of them mentioned that mothers fail to comply with

their appointments because of fever and swelling around the injection site following immunization. Some mothers expressed their view that mothers fail to come back because of "ignorance", laziness and lack of information. One informant noted that "a neighbour of mine got her child vaccinated once when measles epidemic occurred, but she never came back there after because she thought it was enough". Another woman reported: "I did not know that mothers can also get vaccinated, I thought it was only children who should get vaccination".

### **5.6.2 Evaluation of Behaviour and Performance of Immunization Service**

#### **Providers**

The focus group participants generally reported that they were in good terms with the service providers. They said that "health workers show good behaviour towards us when we come to immunization service, but they are rude and some time uncooperative when our children get sick". Few mothers in big town noted that "health workers are rude, they do not even bother to help us when our cards are lost. They sometimes go out for tea while we are sitting waiting for them; they are careless in that they do provide injections even if the needles and syringes fall to the floor."

Most mothers have agreed that health workers provide priority to immunization and usually are timely, advice us on the importance of immunization and are also very cooperative especially if they have immunization cards.

### **5.6.3 Service Convenience**

Most of the informants revealed that the service is convenient to them, but some of those who are from rural area complained that long distance is a problem to some of

them and "especially during the rainy season; health workers do not come to our village so we have to come here to have our children vaccinated " .

#### **5.6.4 Information on Immunization**

Mothers appreciated the helpful advice on immunization in few group sessions, but in many they felt that education is either not given or if at all given was not adequate.

### **5.7 Results of Focus Group discussion with service providers**

#### **5.7.1 Technical competence evaluation**

In most of the discussion, health workers noted that most immunization providers have the necessary skill to execute vaccination (skill of injection, sterilization, cold chain management, and communication); but they didn't deny that occasionally abscess do occur following immunization. Abscess following immunization was attributed to lack of skill of injection. Most of them agreed that such kind of events occur usually by untrained and less experienced vaccinators. They also admitted that most of the cold chain equipment are given to them without proper training and thus usually face difficulties when the equipment breaks like forinstance when refrigerator breaks.

#### **5.7.2 Problems Encountered in Communication**

Most believe that the communication between mothers and providers is not satisfactory, as there is serious shortage of human resources. One health worker noted "as you have seen me today, I am the only person to register, weigh and give vaccine; therefore I did not have the time to advice mothers". Most of the participants are of the opinion that health education is not given regularly to mothers because of lack of

manpower and motivation.

### **5.7.3 Access to Service and Missed opportunity**

Most of the participants felt that vaccination is accessible to all children through static and out reach services. Most claimed that they use vaccination card as a gate keeper to entry to health institutions. Although many of them claimed that they do screen for vaccination status, they have witnessed that they do not go beyond verbal history for vaccination status.

In most of the sessions, they have reported shortage of vaccines that contributed to high missed opportunity and in addition the zonal health department has a policy of not opening a vial of vaccine unless five children are presented. In view -of this, most health institutions have changed their static service from daily basis to once a week or once a month.

### **5.7.4 Monitoring and follow up**

With the exception of few participants, all noted that their follow up mechanism is irregular and as a result the number of defaulters are high. There was no mention of the existence of disease surveillance in all the discussion. Most revealed that they have never been supervised for the last 3 months by their respective higher institution.

### **5.7.5 Logistics and Supplies**

All participants complained of shortage of vaccines, perdiem, spare parts and transport facilities. They had reported that it was more than six months since they last got their perdiem. Syringe and needle replacement was not timely as they witnessed that most had used for more than a year.

Table 5. Summary of focus group discussion with mothers

Variables	Findings of the FGDs
Mother's view on vaccination service	it was valued as beneficial by most mothers
Misconceptions on the service	EPI Protects children against diarrhoea, meningitis, kwashiorkor and abdominal cramp
Reasons given for none compliance	fever and swelling around the the injection following immunization, ignorance, and lack lack of information
Health worker's behaviour and performance	generally mothers reported having good relationship with health workers but few mothers from town said that health workers are rude and none cooperative
Service convenience	most agreed that the service is convenient but for some rural mothers distance is the main problem
Information and communication	many mothers said that health education is not given

Table 6. Summary of focus group discussion with service providers

Variables	Findings of the FGDs
Technical competence	was judged as satisfactory in most of service providers except in few who are untrained
communication	communication is judged as unsatisfactory
Access to service	most believe that service is accessible through static and out reach sites but missed opportunity is high as a result of lack of vaccines and refusal to open a vial of vaccine for children who are less than five in number
Monitoring and supervision	defaulters are high as a result of poor follow up mechanism and screening at health institution is poor
Logistics and supplies	all complained shortage of vaccines, perdiem, and spare parts

## 6. DISCUSSION

The three level of measurement of quality of health care, as used by Donebedian (1980), that include structure, process and out come of service were assessed in this study and multiple deficiencies have been documented at each level that can partly account for the low EPI coverage in the zone.

Properly functioning refrigerators and knowledgeable health workers are crucial to keep vaccines potent and effective at all levels. Besides, Potent vaccines have to be administered safely, vaccines should be available at sufficient stock, service must be accessible and convenient to mothers, and mothers should be educated about the minor side effects, importance of immunization, place and specific days of immunization.

More than two third of the service providers are trained in peripheral level EPI training and their knowledge on the route of administration of vaccines, doses, interval between doses and the recommended age was correct in almost all the service providers. Unlike this one, studies done in Sudan by Loevinsohn had shown that 51% of the health worker did not know the recommended age for measles immunization and 46% did not know the minimum age between doses of DPT (38). In this study service providers are not knowledgeable in the contraindication policy of the country as 58% said that fever is a contraindication to vaccination. This seems better than studies done in Sudan where 80% of health workers reported fever to be a contraindication (38). Training on cold chain maintenance is not sufficient to keep the cold chain in good order.

Except, one health institution, all have a functional steam sterilizer to sterilize syringes and needles

which is the most important factor in the delivery of proper immunization service. Sterility of needles and syringes is satisfactory in this study as opposed to reports by WHO (36). But there is a remarkable problem with the aseptic procedures required to administer vaccines safely during the service delivery as revealed in the observation and focus group discussion with mothers. More than 40% of the time service providers delivered vaccines without the strict rules of aseptic procedures and only in 30% of the encounters have they shaken the vials of TT and DPT. This can result in administration of sub potent and unsafe vaccines resulting in immunization failure and consequently lead to loss of public confidence in the service.

The fact that one or more episodes of vaccine stock outs were reported for one or more vaccines in 1995/96 in more than half of the health institution and were observed in 4 health institution during the research team visit has great impact on the continuous service delivery required to minimize missed opportunities. This is contrary to the National Review that indicated no shortage of vaccine exists in the country (6). Stock out episode in more than 50% of the health institutions is unacceptable, as there should not be any vaccine stock outs if effective routine services are to be delivered with minimal or no missed opportunities. Focus group discussion with service providers revealed that the shortage of vaccines were ascribed to the poor procurement of vaccine in the zonal health department.

Vaccine stock outs documented in this study is more or less similar to studies done in Niger (39) in which 40% of the health institution assessed had shown vaccine stock outs.

Studies on cold chain assessment in Chile (40) was found to satisfy only 60% of the procedural standards of vaccine storage and handling, indicating unsatisfactory performance (temperature was regulated in only 38% of cases, refrigerator contained food item or used for storage of drugs, sera and other dental instruments). In this study, however, vaccine handling and storage was judged to be satisfactory.

Kerosine and spare parts were reported to be deficient in this study which might suggest power interruption though, this was not revealed during the research team visit. Besides the proper sterilization of equipment and storage of vaccine, adequate supply of injection equipment, motivated professionals and proper supervision is required (37). But in this study it was noted that syringes and needles replacement was inadequate to the extent that in some health institutions needles and syringes were used for up to two years by frequent resharpening; similar observation was made during the National EPI review (6). This can be very painful leading to poor compliance in the service. Professionals seem to be demotivated due to lack of proper incentive as revealed in the focus group discussion with service providers (six months have lapsed since they got their last per diem and it is at least more than a quarter since they were supervised by their respective higher institution). Focus group discussions with service providers have also revealed that faulty immunization technique, especially among the untrained health workers, is the most likely cause of adverse events following immunization. However, it was observed that more than 20% of the time health workers used their hands to pick syringes and in those who have forceps, most of them were observed to put the forceps in the rack cover which could lead to contamination during opening and closing of the

rack and hence can be a cause of AEFIS.

The missed opportunity rate documented in this study (15% for children and 65% for mothers) seems better than studies done in Adis Ababa in 1989 (41) in which missed the opportunity rate for children less 2 years old was 41% and nearly 60% missed opportunity rate was documented in Sudan (38) for one or more antigens. Missed opportunity studies in other countries were reported to be 33% in India (42) and 60% in Pakistan (43). It was observed that if mothers claim that their children are immunized, health workers, invariably in all health institutions, did not attempt to cross-check mother's history with their own registration books; this might be very difficult especially in health stations where there is shortage of service providers. Immunization clients should have general information regarding immunizable diseases, the benefit and possible side effect of inoculation; the need for repeat doses and specific dates, time and location.

Studies done in eastern Zimbabwe to find out reasons for the low EPI coverage showed poor quality of immunization delivery to be the main cause, as service providers did not give mothers the chance to express their views, discuss their problems and make suggestions (24). Similarly, poor communication was documented in this study that can compromise the quality of service, as opportunities were not used to inform/ educate mothers.

Accessibility of service (75%) is satisfactory except in one health institution in which EPI geographical coverage (distance within 5Km) is 7%. This is because the health institution was functional only in the last quarter of the 1995/96 as it was a newly

and maintain continuity of use of services (34). In this study, question in response to general satisfaction showed a satisfaction rate greater than 97% to both the behaviour of service providers and the type of service received; but the validity of this instrument is questionable because of social desirability/ courtesy bias that may have resulted from frequent contact with health workers in matters other than immunization and reluctance to express negative opinion by clients. However, when specific services and behaviour characteristics were asked, only 2.6 were satisfied with the health workers showing conformance with the result of some of the focus group discussion and observation. Satisfaction is affected by prior beliefs, knowledge, and experience and hence patients may express satisfaction independent of the actual care received (35). But the fact that the study was triangulated by different methods of data collection can reveal the actual quality of service rendered by service providers.

### **7.Limitation and strength of the study**

The very reason that the study was institutional based might underestimate the results related to satisfaction as it is possible that dissatisfied clients might not come to health institutions. Providers might also show the best behaviour response during client provider interaction and perhaps users might also show courtesy bias during the exit interview. But both the above facts will only affect detecting quality deficit which gives more weight to the current findings. Observation was made by the same person, to avoid inter-observer bias, throughout the client provider interaction that increases the validity of the study. Besides, the fact that triangulation method was used to collect the data from

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ANNEX I

EXIT INTERVIEW FOR MOTHERS/CAR TAKERS OF < 2 YEARS CHILDREN

GREETING.

GOOD MORNING/GOOD AFTERNOON. WE WOULD LIKE TO ASSESS THE IMMUNIZATION SERVICE IN THIS HEALTH INSTITUTION AND WOULD BE VERY MUCH INTERESTED TO FIND OUT YOUR EXPERIENCE TO DAY. I WOULD LIKE TO ASK YOU A FEW QUESTIONS ABOUT IMMUNIZATION SERVICE IN THIS HEALTH INSTITUTION AND WOULD BE VERY GREATFUL IF YOU COULD SPEND A FEW MINUTES ANSWERING QUESTIONS RELATED TO THE SERVICE. ALL INFORMATION YOU GIVE WILL BE KEPT STRICTLY CONFIDENTIAL. YOUR PARTICIPATION IS VOLUNTARY AND YOU ARE NOT OBLIGED TO ANSWER ANY QUESTIONS YOU DON'T WANT. DO I HAVE YOUR PERMISSION TO CONTINUE?

NAME OF HEALTH INSTITUTION \_\_\_\_\_

.NAME OF WEREDA \_\_\_\_\_

.ZONE \_\_\_\_\_

.CODE No \_\_\_\_\_

.DATE OF INTERVIEW \_\_\_\_\_

.SIGNATURE OF INTERVIEWER \_\_\_\_\_

**IA. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF MOTHERS.**

1. age of mother in years \_\_\_\_\_
  
2. Marital status of the mother
  - (1) Married                      (2) Single/never married
  - (3) divorced                      (4) Widowed
  - (5) other specify \_\_\_\_\_
  
3. What is the age of the last youngest Child in months? \_\_\_\_\_
  
4. What is the highest level of school you attended?
  - (1) didn't attend school
  - (2) literacy education
  - (3) last grade completed \_\_\_\_\_
  
5. What is your religion?
  - (1) Orthodox Christian                      (2) Muslim
  - (3) other Christian                      (4) other specify \_\_\_\_\_
  
6. What is your ethnic Origin?
  - (1) Amhara    (2) Oromo                      (3) Tigray                      (4) otherspecify \_\_\_\_\_
  
7. What is your occupation?
  - (1) government employee
  - (2) Private enterprise employee
  - (3) merchant
  - (4) house wife
  - (5) Student
  - (6) other \_\_\_\_\_
  
8. Ask only those married, What is the husband's occupation?
  - (1) government employee
  - (2) private enterprise employee

- (3) farmer
  - (4) Merchant
  - (5) daily labourer
  - (6) Other (specify) \_\_\_\_\_
9. What is the average monthly income of your husband in Birr?
- (1) < 50      (2) 50-100      (3) 101-200      (4) 201-400
  - (5) > 400      (6) don't know

**I CLIENT SATISFACTION**

10. Are you satisfied with the way the health workers treated you?
- (1) Yes      (2) No      (3) don't know
  - (4) other (specify) \_\_\_\_\_
11. If the answer to question 10 is yes, what characteristics of the health worker satisfied you?
- 1      way of greetings
  - 2      concern for your problem
  - 3      information given
  - 4      attitude towards you
  - 5      advice on appointment
  - 6      other (specify) \_\_\_\_\_
12. If the answer to question 10 is no, why not?
- (1) the health worker was rude
  - (2) the health worker was in a hurry
  - (3) had shown no concern for my problem
  - (4) didn't give any advice/information
  - (5) other(specify) \_\_\_\_\_
13. Are you satisfied with immunization service?
- (1) Yes      (2) No
14. If the answer to question 13 is yes, what in the service satisfied you?

1. availability of chairs/bench for sitting
  2. waiting time was not long
  3. technical skill of the worker
  4. the cleanliness of the worker
  5. weighting the child and advice on growth and development of the child
  6. Screened the child for illness
  7. vaccine preventable disease have decreased
15. If the answer is No to question 13, what in the service dissatisfied you?
1. waiting time was long
  2. child was not weighed and screened
  3. absence of chair/bench for sitting
  4. unclean work
  5. child developed abscess
  6. other (specify)\_\_\_\_\_

**IC Information given**

16. Did the health worker discuss about immunization with you? 1) yes (2) No
17. If yes to question 16, what did he/she discuss about immunization?
1. What immunization is
  2. types of disease prevented by immunization
  3. when, how and where vaccines are given
  4. advice on side effects of immunization
  5. appointment for the next session
  6. Other(specify)\_\_\_\_\_
18. If yes to question 16, when was the information given?
- (1) during health education
  - (2) during vaccination session
  - (3) other (specify)\_\_\_\_\_
19. If the answer to question 18 is during health education, how long was the time?

- (1) too short            (2) about right (3) too long  
 (4) don't know            (5) other \_\_\_\_\_
20. If the answer to question 19 is during the immunization session, how satisfactory was the consultation?  
 (1) very satisfactory (2) satisfactory  
 (3) unsatisfactory            (4) other (specify) \_\_\_\_\_
21. If the answer to question 20 is satisfactory or very satisfactory, what makes it satisfactory?  
 1. allowed me to ask questions  
 2. the provider was easy to understand  
 3. the provider was courteous  
 4. the provider was not in a hurry  
 5. other specify \_\_\_\_\_

**ID. ACCESS TO SERVICE**

22. Was the service convenient to you?  
 (1) yes            (2) No            (3) don't know
23. If yes to question 22, what makes it convenient?  
 1. opening hours    (2) waiting time  
 (3) distance to travel            (4) other (specify) \_\_\_\_\_
24. Apart from this health institution, is there any vaccination centre or out reach near your village?  
 (1) yes            (2) No    (3) I don't know
25. If yes to question 24, why did you come here?  
 (1) opening hours are convenient here  
 (2) better quality service  
 (3) to get treatment  
 (4) prefer provider here  
 (5) wanted to be anonymous  
 (6) other (specify) \_\_\_\_\_
26. have you ever been returned home without getting vaccination during your

appointment?

(1) yes (2) No

27. If yes to question 26, what was the reason for not getting vaccination?

(1) vaccine not available (2) vaccinators were absent  
(3) don't know (4) other (specify) \_\_\_\_\_

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

(1) less than 1/2 an hour (2) 1-2 hours (3) > 2 hours  
(4) don't know (5) No answer

**IE. MISSED OPPORTUNITIES**

29. Do you have immunization card of the child with you?

(1) yes (2) No

30. Do you have immunization card of your own?

(1) yes (2) No

31. If yes to question 30, did the child receive all the immunization for which he/she is eligible to day?

(1) yes (2) No

32. If No to question 31, do you know any reason why your child did not receive the immunization?

(1) was not told to get her child vaccinated  
(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) \_\_\_\_\_

33. If the child has no immunization card, do you know why the child has no immunization card?

(1) has finished immunization and the card is at home.  
(2) has not finished but card was lost.  
(3) has finished but card was lost  
(4) other (specify) \_\_\_\_\_

34. If the mother has a vaccination card, did she receive the dose of TT for which

she was eligible today? (1) yes (2) No

35. If no to question 34, why was the reason for not being immunized?

(1) mother refused to get the TT vaccination

(2) mother not asked to be vaccinated

(3) other(specify)\_\_\_\_\_

36. If she doesn't have immunization card, what is the reason?

(1) not given for her

(2) lost her card

(3) refused to get vaccinated

(4) not eligible

(5) other (specify)\_\_\_\_\_

**ANNEX II**

**INTERVIEW FOR VACCINATORS AND EPI CO-ORDINATORS**

**THIS QUESTIONNAIRE IS DESIGNED TO HEALTH WORKERS WHO WERE FOUND VACCINATING CHILDREN DURING THE VISIT OF THE RESEARCH TEAM AND EPI CO-ORDINATORS AT THE RESPECTIVE HEALTH INSTITUTIONS.**

**.NAME OF HEALTH INSTITUTION \_\_\_\_\_**

**.NAME OF WEREDA. \_\_\_\_\_**

**.ZONE \_\_\_\_\_**

**.CODE NUMBER \_\_\_\_\_**

**.POSITION OF THE RESPONDENT \_\_\_\_\_**

**.DATE OF INTERVIEW \_\_\_\_\_**

**.SIGNATURE OF INTERVIEWER \_\_\_\_\_**

**GREETING:**

**WE ARE CARRYING THE SURVEY TO ASSESS THE QUALITY OF IMMUNIZATION SERVICE IN YOUR HEALTH INSTITUTIONS. WE WOULD BE INTERESTED TO KNOW FROM YOU, YOUR EXPERIENCE SO FAR WITH IMMUNIZATION. COULD I ASK YOU A FEW QUESTIONS ABOUT THIS? PLEASE BE ASSURED THAT THIS DISCUSSION IS STRICTLY CONFIDENTIAL AND THAT YOUR NAME IS NOT RECORDED. MAY I CONTINUE?**

## IIA KNOWLEDGE ON IMMUNIZATION

37. Have you ever attended any of the following training courses?
- a. low level EPI training (1) yes (2) No
  - b. mid level EPI training (1) yes (2) No
  - c. cold chain maintenance (1) yes (2) No
  - d. motorcycle riding training(1) yes (2) No
38. If the answer to any of the above is yes, do you think that the training you have received is adequate to perform your duties?
- (1) yes (2) No (3) don't know (4) No answer
39. If no, why not? ( 1) time was not adequate  
 (2)training was not practical (3) Teaching Aids were not available (4) other (specify)\_\_\_\_\_
40. How and when do you give vaccines to children and mothers?

type of vaccine	recommended age	route	dosage	minimal interval
BCG				
DPT1				
DPT2				
DPT3				

OPV0				
OPV1				
OPV2				
OPV3				
mea---				
TT1				
TT2				

41. What are the main contraindication accepted by who to immunization?  
 (1) fever (2)malnutrition (3)URTI  
 (4) child seriously ill requiring admission  
 (5) child had convulsion due to DPT1 (6) Child has diarrhea(7)child with clinical Aids (8) other (specify)\_\_\_\_\_
42. What is the recommended temperature to store vaccine? \_\_\_\_\_
43. Which vaccines are damaged if temperature goes below 0 degree c.? (1)DPT  
 (2) TT (3) Polio (4) measles  
 (5) BCG
44. Which vaccines should be stored near the freezer compartment/Top level? (1)  
 DPT, TT  
 (2) polio measles (3) BCG, diluent (4)other specify\_\_\_\_
45. What is the maximum time during power failure the vaccine can stay in the refrigerator (hold over time)?  
 (1) 24 hrs (2) 1 hour (3) 6 hours  
 (4) other (specify)\_\_\_\_\_
46. For how long do you sterilize syringes and needle in boiling water in hours or minutes? \_\_\_\_\_
47. How long should you use a reusable needle and syringe before it needs to be replaced? \_\_\_\_\_
48. How do you know whether vaccines are frozen or not?  
 (1) shake test (2)looking at the temperature

(3) don't know      (4) other (specify) \_\_\_\_\_

### **IIB PRACTICE ON IMMUNIZATION**

49. During planning for immunization, do you involve community leaders as to where and when schedule be for out reach service? (1) yes (2) No
50. Have you ever rescheduled your programme service for the sake of mothers' convenience to improve attendance?  
(1) yes (2) No
51. In your static service, how many times per week is immunization provided? \_\_\_\_\_
52. Have you ever cancelled a session because of logistics problem? (1) yes(2) No
53. If yes to question 55, what did you do for the inconvenience (Interruption of service)?  
(1) apologize on the next session  
(2) apologize on the same day  
(3) nothing done  
(4) other (specify) \_\_\_\_\_
54. Do you screen mothers and children who come to your health institution whether they are immunized? (1) Yes (2) No
55. Do you open a vial of vaccine even if one child is available? (1) yes (2) No
56. Do you have any mechanism to trace defaulters?  
(1) yes (2) No
57. If yes to question 59, how do you do that?  
(1) home visit by health workers  
(2) home visit by CHAs  
(3) home visit by Kebele leader  
(4) other specify \_\_\_\_\_
58. What transport type do you use for out reach service?  
(1) motor vehicle (2) car (3) public bus  
(4) on foot
59. Which of the above transport options are frequently used?  
(1) public transport (2) motorcycle (3) car (4) on foot  
(5) other(specify) \_\_\_\_\_
60. Do you have sufficient vaccine stocks through out the year. (1)yes (2) No
61. If no to question 60, which vaccine run out of stock?  
(1) DPT (2) measles (3) OPV (4)BCG (5) other \_\_\_\_\_
62. Who maintains the refrigerator when it breaks?  
(1) health workers in the health institution (2) EPI coordinators of the health institution (3) experts from the district/zone (4) other(specify) \_\_\_\_\_
63. How often does the refrigerator break? (1)once in a week (2) once in two weeks(3) once a month (4) once quarterly (5)once in 6 months  
(7)other(specify) \_\_\_\_\_
64. How long does it take to get it repaired if the technician comes from other area? (1) one week (2) one month (3) > one month (4) other(specify) \_\_\_\_\_

65. Where do you keep the vaccine during refrigerator break down? (1)cold box (2) vaccine carrier (3) transport to other health institution (4) other(specify)\_\_\_\_\_
66. Did you achieve your coverage target of the last year plan? (only to EPI coordinator) (1) yes (2) NO
67. Do you carry out surveillance of EPI diseases?  
(1) yes (2) NO
68. If yes to question 70, what is the trend of the disease? (1)decreasing (2) constant (3) increasing (4)other (specify)\_\_\_\_\_
69. If there is surveillance, were there any actions taken in response to the surveillance? (1)yes (2) NO
70. Have you been supervised in the last three months by your supervisors?  
(1) yes (2) No
71. If yes to ques. 70, did you receive the feed back of the supervision?
72. Do you report EPI activities on monthly basis?  
(1) yes (2) No

**ANNEX III**

**III OBSERVATION GUIDE FOR INTERACTION BETWEEN CLIENTS AND PROVIDERS AND SKILL OF THE PROVIDER**

**INSTRUCTION TO OBSERVER:**

**OBTAIN THE CONSENT OF BOTH CLIENT AND PROVIDER BEFORE PROCEEDING TO OBSERVE THE INTERACTION BETWEEN THEM. WHEN OBSERVING, BE AS DISCRETE AS POSSIBLE AND ON NO ACCOUNT BECOME INVOLVED IN THE INTERACTION. MAKE SURE THAT THE PROVIDER KNOWS THAT YOU ARE NOT THERE TO EVALUATE HIM/HER AND THAT YOU ARE NOT AN "EXPERT" WHO CAN BE CONSULTED DURING THE SESSION. TRY TO SIT SO THAT YOU ARE BEHIND THE CLIENT BUT NOT DIRECTLY IN VIEW OF THE PROVIDER. MAKE NOTES AS QUICKLY AS POSSIBLE.**

**CODE NO** \_\_\_\_\_

**NAME OF HEALTH INSTITUTION** \_\_\_\_\_

**WEREDA** \_\_\_\_\_

**POSITION OF THE PROVIDER** \_\_\_\_\_

**ZONE** \_\_\_\_\_

**NAME OF OBSERVER** \_\_\_\_\_

**SIGNATURE OF OBSERVER** \_\_\_\_\_

### **IIIA. CLIENT PROVIDER INTERACTION**

73. Did the provide greet the client in a friendly way?  
(1) yes (2) No
74. Did the provider allow her to sit in a chair/bench during the consultation ?  
(1) yes (2) No
75. Did the provider do the following ?  
a. Discuss on importance of immunization (1)yes (2)No  
b. Asked if the child has problem (1) yes (2)No  
C. Weighed and told to the mother about the nutritional status of the child (1) yes (2) No  
d. Screen the immunization status of the child and mother and ask consent for immunization (1) yes (2) No
76. Did the provider clearly state what he/she is going to do to the child or mother? (1) yes (2) No
77. Did the provider tell the client about the side effects and what to do when they occurred? (1) yes (2)No
78. Did the provider tell clearly as to when she should return and why? or reassured if she had finished the schedule?  
1) yes (2) No

### **IIIB SKILL OF THE PROVIDER IN IMMUNIZATION**

79. Where did the provider put the vaccine?  
a) in ice cube (2) in ice packs  
(3) in a boiling pan (4) table  
(5) other(specify)\_\_\_\_\_
80. Did the provider use forceps to pick up needle and syringes?  
(1) Yes (2) No
81. Did the provider use different syringe and needle for each child? (1) Yes(2) No
82. Did the provider use hot water cotton swab before giving the injection? (1) yes (2) No

ANNEX IV

**IV INVENTORY CHECKLISTS FOR LOGISTICS OF IMMUNIZATION**

THIS INVENTORY SHOULD BE COMPLETED BY OBSERVING THE FACILITIES THAT ARE AVAILABLE AND THROUGH DISCUSSION WITH the EPI CO-ORDINATOR OF THE HEALTH INSTITUTIONS. IN ALL CASES YOU SHOULD VERIFY THAT THE ITEMS EXIST BY ACTUAL OBSERVING THEM YOURSELF AND WHETHER THEY ARE FUNCTIONAL OR NOT.

NAME OF HEALTH INSTITUTION \_\_\_\_\_  
NAME OF WEREDA \_\_\_\_\_  
ZONE \_\_\_\_\_  
NAME OF OBSERVER \_\_\_\_\_  
.SIGNATURE \_\_\_\_\_

#### IV.A IMMUNIZATION ROOM

Which of the following are present and indicate if they are functional and adequate.

83. Flip charts and posters of immunization  
a. Present (1) yes (2) No  
b. Functional (1) yes (2) No  
c. Adequate (1) yes (2) No
84. Immunization room with tables and chairs or benches  
a. present (1) yes (2) No  
b. adequate (1) yes (2) No
85. Registration books and tally sheets  
a. Present (1) yes (2) No  
b. Functional (1) yes (2) No  
c. adequate (1) yes (2) No
86. Weighing scale.  
a. Present (1) Yes (2) No  
b. Functional (1) yes (2) No  
c. Adequate (1) yes (2) No
87. immunization card  
a. Present (1) yes (2) No  
b. Adequate (1) yes (2) NO
88. Boiling pan  
a. present (1) yes (2) No  
b. functional (1) yes (2) No  
c. adequate (1) yes (2) No
89. Stove  
a. present (1) yes (2) No  
b. adequate (1) yes (2) No  
c. functional (1) yes (2) No
90. Needle container  
a. present (1) yes (2) NO  
b. adequate (1) yes (2) No
91. Time clock.  
a. present (1) yes (2) No  
b. functional (1) yes (2) No
92. forceps  
a. present (1) yes (2) No  
b. functional (1) yes (2) No  
c. adequate (1) yes (2) No
93. Steam sterilizer  
a. present (1) yes (2) No  
b. functional (1) yes (2) No

- c. adequate (1)yes (2)No
94. Needles and syringes  
 a. present (1)yes (2)No  
 b. adequate (1)yes (2)No  
 c. functional (1)yes (2)No
95. What is the source of heat for sterilization ?  
 kerosine (2) gas (3) electricity (4) charcoal  
 (5)others \_\_\_\_\_
96. If there is steam sterilizer, do they time it for 20 minutes?  
 (1)yes(2)No
97. If boiling pan is available for sterilization, do they count from the time water starts to boil? (1) yes (2)No

**IVB cold chain room**

98. a refrigerator  
 a. present (1) yes (2) No  
 b. functional (1)yes (2)No  
 c. adequate (1)yes (2)N0
99. type of refrigerator (1) Absorption (2) compression  
 (3) solar (4) other(specify)\_\_\_\_\_
100. thermometer  
 a. present (1) yes (2) No  
 b. functional (1) Yes (2) No
101. cold boxes  
 a. present (1) yes (2) No  
 b. functional (1) yes (2)No  
 c. adequate (1) yes (2)No
102. vaccine carrier  
 a. present (1)yes (2)N0  
 b. adequate (1)yes (2) No  
 c. functional (1)yes (2)No
103. If they have refrigerator, indicate the following  
 a. Is vaccine storage space adequate? (1) yes (2) No  
 b. Is temperature effectively controlled? (1) yes (2) No  
 c. Is there temperature monitoring chart? (1) yes (2) No  
 d. Does it freeze enough ice pack? (1) yes (2)No  
 e. Are vaccine arranged properly? (1) yes (2) No  
 f. Is there expired vaccine? (1) yes (2) No
104. If there are cold boxes and vaccine carriers, indicate the following:  
 a. Are they in good condition? (1) yes (2) No  
 b. Their lid fit properly? (1) yes (2) No
105. Is there vaccine control card? (1) yes (2) No
106. Is the vaccine control card up to date? (1) yes (2) No

107. Do they have reorder level, maximum stock and minimum stock? (1) yes (2) No
108. Is there enough kerosine (for refrigerators which use kerosine)? (1) yes (2) No
109. Do you have adequate spare parts? (1) yes (2) No
110. If no, indicate which:
- a. wick (1) yes (2) No
  - b. lamp glass (1) yes (2) No
  - c. sealing ring (1) yes (2) No
  - d. fuse (1) yes (2) No

**IVC. TRANSPORT FACILITIES AND BUDGET**

111. Transport.
- a. Motor cycle (1) yes (2) No (3) Non-functional
  - b. Bicycle (1) yes (2) No (3) Non-functional
  - c. Car (1) yes (2) No (3) Non-functional
  - d. Mule/horse (1) yes (2) No
112. How often does your vehicle break? (1) monthly (2) quarterly (3) other(specify) \_\_\_\_\_
113. Do you have enough budget for maintenance of vehicle ? (1) yes (2) No
114. Do you have enough budget for per diem? (1) Yes (2) No
115. Do you have enough budget for fuel? (1) yes (2) No

**ANNEX V**

**V DOCUMENT AND RECORD REVIEW**

**THIS REVIEW SHOULD BE DONE IN CONSULTATION WITH THE EPI CO-ORDINATOR OR A PERSON WHO IS IN CHARGE OF EPI REPORTING. REGISTRATION BOOK, CHARTS, REPORTING FORMATS AND ETC SHOULD BE THOROUGHLY INVESTIGATED.**

**NAME OF HEALTH INSTITUTION \_\_\_\_\_**

**CODE-NUMBER \_\_\_\_\_**

**WEREDA \_\_\_\_\_**

**ZONE \_\_\_\_\_**

**NAME OF INVESTIGATOR \_\_\_\_\_**

**SIGNATURE OF INVESTIGATOR \_\_\_\_\_**

**DOCUMENT REVIEW**

- 116.a Total number of P.A. \_\_\_\_\_
- 116.b Total number of U.D.A \_\_\_\_\_
116. c Target population of < 1 children \_\_\_\_\_
- 116.d Total number of 15-59 years women \_\_\_\_\_
- 116.e Number of out reaches \_\_\_\_\_
- 116.f Geographical EPI coverage (percent) \_\_\_\_\_
- 116.g Health service coverage \_\_\_\_\_
- 116.h Immunization coverage interims of DPTs (percent) \_\_\_\_\_
- 116.i Total number of children vaccinated for DPT1 last year \_\_\_\_\_
- 116.j Total number of children who had completed DPT3 among those who started DPT1 in the same year \_\_\_\_\_
- 116.k No. of children vaccinated for BCG, in the last year \_\_\_\_\_
- 116.l No. of children who are fully immunized in last year. \_\_\_\_\_
117. Is there immunization monitoring chart? (1) yes (2) No
118. If yes, is it done for all antigens? (1) yes (2) No
119. Was action taken according to the results of EPI monitoring chart?  
(1) yes (2) No
120. Are the 14 EPI formats functional?  
(2) yes (2) No
121. If yes, which ones are functional and which ones are not?
- |        |         |        |
|--------|---------|--------|
| EPI 1  | (1) yes | (2) No |
| EPI 2  | (1) yes | (2) No |
| EPI 3  | (1) yes | (2) No |
| EPI 4  | (1) yes | (2) No |
| EPI 5  | (1) yes | (2) No |
| EPI 6  | (1) yes | (2) No |
| EPI 7  | (1) yes | (2) No |
| EPI 8  | (1) yes | (2) No |
| EPI 9  | (1) yes | (2) No |
| EPI 10 | (1) yes | (2) No |
| EPI 11 | (1) yes | (2) No |
| EPI 12 | (1) yes | (2) No |
| EPI 13 | (1) yes | (2) No |
| EPI 14 | (1) yes | (2) No |
| EPI 15 | (1) yes | (2) No |

### Topic Guides

1. Is the immunization service in your area useful? Why? Why not?
2. What problems have you encountered when your children get vaccinated and during the process of vaccination?
3. How do you assess the performances of health workers in immunization? (manner, skill, punctuality, advice, does this has effect on your attendance for immunization? How?
4. how accessible is the service to you? (distance, time, availability of vaccine, regularity of the service)
5. How do vaccine providers behave towards you? (when you come late, when cards are lost, refuse to vaccinate your child/yourself default etc) and what is the effect of this on you? Why?
6. Do you get satisfactory health education from health workers with regard to immunization? Why?
7. What do you like most and dislike most in the service providers?
8. Why do you think people default from immunization?
9. What do you want to see improved in immunization service?.

ANNEX VII

VII FGDs WITH HEALTH WORKERS PROVIDING IMMUNIZATION.

**INSTRUCTION:**

**HELLO! WE WOULD LIKE TO ASSESS THE QUALITY OF SERVICE IN IMMUNIZATION; THEREFORE, YOUR EXPERIENCE IN THE SERVICE, IDEAS AND COMMENTS ARE VERY MUCH APPRECIATED AND REQUIRED FOR THE ENDEAVOUR. THERE IS NO RIGHT OR WRONG ANSWER. YOU CAN FORWARD WHAT EVER IDEAS OR FEELINGS YOU MAY HAVE. MAY I CONTINUE?**

**.NAME OF HEALTH INSTITUTION** \_\_\_\_\_  
**.CODE NUMBER** \_\_\_\_\_  
**.WEREDA** \_\_\_\_\_  
**.ZONE** \_\_\_\_\_  
**.TIME INTERVIEWING STARTED** \_\_\_\_\_  
**.TIME INTERVIEWING FINISHED** \_\_\_\_\_  
**.TOTAL TIME** \_\_\_\_\_  
**.INTERVIEWERS NAME** \_\_\_\_\_  
**.SIGNATURE** \_\_\_\_\_  
**.RAPORTERS NAME** \_\_\_\_\_  
**.SIGNATURE** \_\_\_\_\_

## Topic Guid

1. How do you see the technical competence of yours and your colleagues in vaccinating children and mother? (cold chain handling, injection skill, communication with clients, recommended schedules).
2. How effective are sterilization technique in your health institutions? How do you do it?
3. In your opinion, what are the factors affecting quality of service in health institutions as far as immunization is concerned?
4. What are the problems in countered during immunization from your side? How would you like to improve it?
5. What is the role of the manager of the health institution in immunization service and how does he/she interacts with you? (concerning problems, logistics, perdiems)
6. How do you evaluate your health education and counselling programmes?(ask if only the programme exists) who, when and how?
7. How accessible is the service to the public at large? (out reaches, static service, missed opportunities, regularity, availability of vaccine, timing, weekends)
8. How do vaccine providers behave towards mothers/client? (way of greeting, attitude towards mothers, manner, facial expression, respect)
9. How do you follow defaulters and trace non users?
10. What do you think about the availability, adequacy and management of EPI logistics? (vaccines, Kerosine, spare parts, transport facilitates, budget etc).

## Declaration

I, the undersigned, declare that this thesis is my work and all sources of materials used for this thesis have been duly acknowledged.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Place: \_\_\_\_\_

Date of Submission \_\_\_\_\_

This thesis has been submitted for examination with my approval as University advisor.

Dr. Mesfin Kassaye \_\_\_\_\_