RISK FACTORS FOR DEFAULTING FROM CHILDHOOD IMMUNIZATION IN *ASOSSA WOREDA, BENISHANGUL GUMUZ* REGION, WESTERN ETHIOPIA

.

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Risk factors for defaulting from childhood immunization in *Asossa woreda, Benishangul Gumuz* region, Western Ethiopia

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Abstract

Back ground: Children are defaulting from childhood immunization due to risk factors, low access to services, inadequate awareness of caregivers, missed opportunities and high dropout rates were recognized since the early years of EPI efforts. Epidemiological investigations of recent outbreaks of vaccine preventable diseases have indicated that incomplete immunization was the major reason for the outbreaks. In Ethiopia, full immunization rate (EDHS, 2011) is low (24.3%) in children age 12-23 months.

Objective: To identify risk factors for defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz, Western Ethiopia***.**

Method: unmatched case control study was conducted in eleven selected *Kebeles of Assosa Woreda*. Baseline survey was done to identify completed and defaulted children from childhood immunization, from which 282 children 12-23months of age (94 defaulted and 188 completed) were selected using SRS. Pre-tested structured questionnaire were used for data collection and analyzed by SPSS version 16. Bivariate and multivariate regressions were used for analysis.

Result: Baseline survey identified 963 children in 12-23 months, 775(80.5%) and 180(18.7%) of them completed and defaulted from immunization respectively. The BCG: measles dropout rate of the sample 282 was 19.8%, the dropout rate of Penta-1: Penta-3 (both defaulted and completed) by card only was 7.8%, dropout rate among the defaulted children was 77.6%. Mother Postponing of immunization schedule [AOR = 5.61, 95%CI: 2.22, 14.16], no antenatal care visit [AOR = 2.89, 95% CI: 1.05, 7.96], time inconvenient [AOR = 2.85, 95% CI: 1.05, 7.70], no provider counseling [AOR = 2.69, 95%CI: 1.21, 5.99], no knowledge about measles vaccine [AOR = 2.76, 95%CI: 1.18, 6.49], knowledge on schedule of vaccines [AOR = 0.24, 95%CI: 0.11, 0.56] and negative Perception on satisfaction of immunization service [AOR = 16.69, 95% CI: 4.06, 68.55] were the important predictors of defaulting from immunization.

Conclusion and recommendation: It is concluded that postponing of immunization schedule, no antenatal care visit, time inconvenient, no immunization counseling, no knowledge about measles vaccine, no knowledge about vaccine schedule & negative Perception on satisfaction of immunization service were found to be the most important predictors of defaulting from childhood immunization.Providing adequate IEC on immunization services.

Key words: Childhood Immunization, Vaccination Incompletion, Vaccine Default, *Assosa*

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List of Acronyms

ANC	Antenatal care
AOR	Adjusted Odds Ratio
BCG	Bacillus Chalmette Guerin
CDC	Center for Disease Control
CHI	Childhood Immunization
COR	Crude Odds Ratio
DHS	Demographic Health Survey
DOR	Dropout Rate
DPT	Diphtheria, *pertusis*, tetanus,
DPT-HepB- Hib	Diphtheria, *pertusis*, tetanus, Hepatitis *typeb*, *Hemophilus* influenza *typeb*
EPI	Expanded Program on Immunization
EDHS	Ethiopian Demographic Health Survey
FMOH	Federal Ministry of Health
GAVI	Global Alliance for Vaccine and Immunization
IEC	Information, Education and Communication
HSDP	Health sector development planning
Hib	*Hemophilus* influenza *typeb*
HIV/AIDS	Human Immune Virus/ Acquired Immune Deficiency Syndrome
MCH	Maternal and Child Health
MDG	Millennium Development Goal
OPV	Oral Polio Vaccine
PCV	Protein conjugated polysaccharide vaccine
PNC	Postnatal Care
SIA	Supplemental Immunization Activity
SPSS	Statistical Package for Social science soft ware
SNNPR	Southern nations, nationalities and peoples
SRS	Simple Random Sampling
USAID	United States Agency for International Development
UNICEF	United Nations International Children's Emergency Fund
VPD	Vaccine Preventable Development
WHO	World Health Organization

1. Introduction

1.1. Background

Immunization deserves high priority, especially in developing countries, for three main reasons: Vaccine-preventable diseases disproportionately affect the poorest fifth of the population, Immunization is among the most cost-effective interventions, has had a major impact in reducing the burden of disease and the benefits are public goods; and newer vaccines, and those under development have the potential to prevent diseases, e.g. tuberculosis, malaria, and human immunodeficiency virus (HIV), that currently cause an enormous burden of disease (1).

About 29,000 children under the age of five die every day, mainly from preventable causes. More than 70 percent of almost 11 million child deaths every year are attributable to six causes: diarrhoea, malaria, neonatal infection, pneumonia, preterm delivery, or lack of oxygen at birth. These deaths occur mainly in the developing world. An Ethiopian child is 30 times more likely to die by fifth birthday than a child in Western Europe. Among deaths in children, South-central Asia has the highest number of neonatal deaths, while sub-Saharan Africa has the highest rates (2).

Epidemiological investigations of recent outbreaks of vaccine preventable diseases indicated that incomplete immunization was the major reason for the outbreaks. Moreover, a low immunization rate was the major reasons for many of the outbreaks of infectious diseases in the past two decades (3).

EDHS 2011 revealed that EPI schedule in Ethiopia is not completed as planned and full immunization rate was low (24.3%) in children age 12-23 months who received specific vaccines at any time before. Regionally, children with full vaccination coverage range of the same age from a high of 79 percent in Addis Ababa and 59 percent in *Tigray* and Dire *Dawa* to a low of 9 percent in *Affar* and 23.6% in *Benshangul Gumuz* (4**).**

1.2 . Statement of the problem

Communicable diseases, many of which are vaccine-preventable, account for 77% of the mortality gap (1*).* In 2002, 7 of every 1,000 children in industrialized countries died before they were five. In South Asia, 97 of 1,000 children died before they were five. And in sub-Saharan Africa, that number is 174 of every 1,000 children (2).

According to the 2011 Ethiopian demographic health survey, for the five years (corresponding roughly to 2006–2010); the infant mortality rate was 59 deaths per 1,000 live births. The estimate of child mortality was 31 deaths per 1,000 children surviving to 12 months of age, while the overall under-5 mortality rate for the same period was 88 deaths per 1,000 live births. Sixty-seven percent of all deaths to children under-five in Ethiopia take place before a child's first birthday. The 2011 EDHS showed a rapid decrease in infant and under-five mortality during the five years prior to the survey compared to the period 5-9 years prior. The levels are also considerably lower than those reported in the 2005 EDHS. For example, infant mortality has decreased by 23 percent, from 77 to 59 deaths per 1,000 births, while under-five mortality has decreased by 28 percent, from 123 to 88 per1, 000 births (**4).**

According to the demographic health survey (DHS, 2005) of Ethiopia, the child mortality rate in *Benshangul Gumuz* Region was 157 per 1000 live births which were the highest in the world (5**).** This was significantly increases to 169 per 1000 live births which were much higher in the world (4).

Immunization is acknowledged to be among the most cost-effective and highest-impact health interventions. Nearly 3 million deaths are prevented each year by immunization, and an even greater amount of illness and disability. An additional 3 million deaths a year could be prevented by existing vaccines (1).

The success of vaccination programs applied at the global level has had few parallels in public health. Immunizations remain one of the most cost-effective health interventions to prevent death and disability caused by infectious diseases. Despite great strides forward in vaccination development and administration throughout parts of the world, many countries, usually the poorest, struggle with vaccinating their children. This gap in immunization coverage results

from many compounding problems, such as low political commitment on behalf of national and local governments, weak health service delivery systems, civil unrest, and under funding and poor management. These problems are further compounded by relatively low levels of research and development of new vaccines to combat the predominant diseases in the developing world (6).

The major obstacles or risk factors to achieving universal immunization including low access to services, inadequate awareness of caregivers, missed opportunities, and high dropout rates have been recognized since the early years of EPI efforts (7). Research and experience show that six of the almost 11 million children who die each year could be saved by low-tech, evidence-based, cost-effective measures such as vaccines, antibiotics, micronutrient supplementation, insecticide-treated bed nets and improved family care and breastfeeding practices (2).

Children are the most vulnerable segment of the population, but many of the ailments that cause death in this population can be avoided by completion of routine childhood vaccination (8). Targets include increasing immunization coverage to at least 90 per cent at the national level and 80 per cent in all districts, with particular focus on reaching population groups with low coverage levels, and the final eradication of polio. Immunization programmes can protect the lives of nearly 4 million children. But progress in meeting this Millennium Goal is the most off track of any (2). The expected outcome of this study will improve health promotion efforts around childhood vaccination uptake and serve as a tool for increasing utilization of existing Expanded Program on Immunization (EPI) efforts.

2. Literature review

A review of literature suggests that vaccination defaulting occurs in many types of settings and that socio-demographic characteristics of the general population, caretakers, cultural factors and accessibility of services influence uptake of childhood immunization.

Vaccine preventable diseases Morbidity and Mortality

Every year more than 10 million children (1960-1990) in low- and middle-income countries die before they reach their fifth birthdays. Most die because they do not access effective interventions that would combat common and preventable childhood illnesses. Infant immunization is considered essential for improving infant and child survival. Although global immunization coverage has increased during the past decade to levels of around 78% for diphtheria–tetanus–pertussis-3 (DTP-3), WHO's African Region has consistently fallen behind, reaching only 69% DTP-3 coverage by 2004 (9**)**.

This reduces to 7.6 million children under five died in 2010. Almost 90% of all child deaths are attributable to just six conditions: neonatal causes, pneumonia, diarrhoea, malaria, measles, and HIV/AIDS. The aim is to further cut child mortality by two thirds by 2015 from the 1990 level. Reaching the MDG on reducing child mortality will require universal coverage with key effective, affordable interventions: care for newborns and their mothers; infant and young child feeding; vaccines; prevention and case management of pneumonia, diarrhoea and sepsis; malaria control; and prevention and care of HIV/AIDS. In countries with high mortality, these interventions could reduce the number of deaths by more than half **(10).**

Vaccine-preventable diseases impose two enormous burdens on the world, one direct, and one indirect. The direct burden is the more obvious: it is the suffering and death of millions of children and adults who are not protected from easily prevented diseases (11).

Over two-thirds of early child deaths are due to conditions that could be prevented or treated with access to simple, affordable interventions. Leading causes of death in under-five children are pneumonia, diarrhea, malaria and health problems during the first month of life. Over one third of all child deaths are linked to malnutrition. Children in low-income countries are nearly 18 times more likely to die before the age of five than children in high-income countries (12).

Mortality estimates can be used to prioritize public health interventions. For VPDs, these estimates indicate the number of deaths that could be averted if existing vaccines were used to their fullest potential. During 2002, approximately 1.9 million (76%) of the 2.5 million VPD deaths among children aged <5 years worldwide occurred in Africa or Southeast Asia (13).

Immunization currently averts an estimated 2.5 million deaths every year in all age groups from diphtheria, tetanus, *pertussis* (whooping cough), and measles. More children are being reached with immunization. In 2010, an estimated 109 million children under the age of one were vaccinated with three doses of diphtheria-tetanus- *pertussis* (DTP3) vaccine. Total number of children who died from diseases preventable by vaccines currently recommended by WHO: 1.7 million, (*Hib*: 260 000, *Pertussis*: 195 000, Measles: 118 000, Neonatal tetanus: 59 000, Tetanus (non-neonatal): 2 000, Pneumococcal disease: 520 000, Rotavirus: 527 000). Estimated number of all deaths in children under five in 2008: 8.8 million, nearly 20% of all deaths in children under five is vaccine preventable and estimated number of all deaths in children 1-59 months of age: 5.2 million.30% of deaths in children 1-59 months of age are vaccine preventable (14).

EPI Coverage and Schedule

More than one-third of African Region districts did not acquire 50% DTP-3/penta-3 coverage by the end of 2004. Coverage levels of other routine vaccines, including measles, oral polio, bacillus Chalmette Guerin (BCG) and tetanus *toxoid* also lagged in many of the same areas. Factors holding back routine immunization services in the African Region included civil unrest, lack of human resources within health ministries, limited funding for routine immunization services, and competition for staff time among individuals involved in polio and measles supplementary immunization activities (9**).**

Much of the progress in reducing child mortality can be attributed to increased immunization coverage, use of oral rehydration therapies during episodes of diarrhea, use of insecticide-treated mosquito nets, and access to *artemisinin* -based combination therapies, efforts to eliminate disease due to *Haemophilus influenzae* type b infection and reduced disease incidence due to improved water and sanitation. However, because the availability and use of

proven interventions at community level remain low, pneumonia and diarrhea still kill 3.8 million children under five each year (15).

Ethiopia and Cameroon have experienced dramatic improvements during the past decade. While coverage rates were 46% and 48%, respectively, during 1999, these had increased to 74% in Cameroon and 75% in Ethiopia in 2009. However, there are still great within-country disparities in these two countries with several areas reporting less than 50% coverage (16). Immunization coverage of children 12-23 months, less than half of the children could produce vaccination card (17).

The weighted national immunization coverage assessed by card plus history for children aged 12-23 months vaccinated before the age of one year was BCG 83.4%, DPT1 84.3%, DPT3 66.0%, measles 54.3%, and fully immunized children 49.9% (18). One year before the termination of HSDP III, *Pentavalent* immunization coverage has reached 82% and measles immunization coverage 76.6%, while the percentage of fully immunized children has reached 65.5%. In this regard, HSDP III target has been already achieved for measles immunization coverage and nearly so for the percentage of fully immunized children. Similarly, five regions (Addis Ababa, *Harari, Amhara, Tigray*, and *SNNP*) have persistently showed better achievements than the national average for the last three consecutive years while, *Gambella, Afar, Somali Benshangule Gumuz* and regions seem to be far less than the average performing half below the targets (19).

Overall, 24 percent of children age12-23 months are fully vaccinated. Basic vaccination coverage has increased by 4 percent since the 2005 EDHS estimate (20 percent). Over 66 percent of children received BCG, 82 percent of children received the first dose of polio vaccine, and 64 percent of children received the first dose of DPT/*pentavalent*. Coverage rates for all three of these vaccines have increased since the 2005 EDHS estimates. Thirty-seven percent of children completed the required three doses of the DPT/*pentavalent* and 44 percent completed the required polio vaccines. Coverage of vaccination against measles is 56 percent. Overall, 15 percent of children in Ethiopia have not received any vaccinations. This represents an improvement from 2005 when 24 percent of children were reported to have not received any vaccinations.

Children in urban areas are more than twice as likely as rural children to be fully vaccinated (48 percent compared with 20 percent, respectively). Regionally, children with full vaccination coverage range from a high of 79 percent in Addis Ababa and 59 percent in *Tigray* and *Dire Dawa* to a low of 9 percent in Afar and 23.6% in *Benshangul Gumuz*. Percentage of children age 12-23 months who received specific vaccines at any time before the survey by source of information (vaccination card or the mother's report) in Ethiopia, 66.3% BCG,19.6% OPV0, 82.3% OPV1,44.3% OPV3, 63.5% penta1, 36.5% penta3, and 55.7% measles. In the same analysis of EDHS, 2011, the coverage's of these antigens in *Benshangul Gumuz* showed 68.7% BCG, 36.4% OPV0, 85.5% OPV1, 45.7% OPV3, 73.3% penta1, 41.7% penta3, and 67.2% measles **(4)**.

The Expanded Program on Immunization (EPI) was launched in Ethiopia in 1980 with the goal of achieving universal child immunization by 1990 (20*)* .The vaccination schedule of Ethiopia is based on the recommendation of World Health Organization (WHO) for developing countries [21].

Table 1: Vaccination schedule of Ethiopia according to the WHO recommendation

Age	Vaccine
Birth	BCG , OPV0
6 weeks	Pentavelent1 (DPT-HepB-Hib1), OPV1 ,PCV1
10 weeks	Pentavelent2 (DPT- HepB-Hib2), OPV2, PCV2
14 weeks	Pentavelent3 (DPT- HepB-Hib3), OPV3, PCV3
9 months	Measles

When determining the most effective schedule for immunization, various factors need to be considered, such as age at which protection is required, ability of the immune system to respond to the vaccine, presence of maternal antibodies, number of doses required to provide protection, epidemiology of the disease and the need to ensure compliance. Taking all these factors into consideration, the EPI schedule has adopted a primary series of 6, 10 and 14 weeks, ensuring protection at the earliest age, with boosters where applicable, and an early measles vaccine at 9 months. The new EPI schedule attests to the commitment that the

government has made to achieve the Millennium Development Goal 4, which aims, by 2015, to reduce by two-thirds the mortality rate among children under five (22).

Reasons for defaulting from childhood immunization

A research on uptake of childhood immunization among mothers of under five conducted in south-western Nigeria indicates almost all the women interviewed (99%) were aware of the immunization with 65.7% obtaining information at antenatal clinics. A good proportion of children aged 12 to 23 months were fully immunized (76.9%), 30% were partially immunized and 0.7% were not fully immunized. Majority had good attitudes to immunization with 84.3% having attitude scores of 75% and above. Immunization of the children was not significantly associated with the socio-demographic characteristics at 5% level of significance. The reasons reported for not completing immunization include long waiting on queues (46.1%), payment at private clinics (20.2%) and distance (17.7%) (23).

Reasons of vaccination defaulting were identified, Logistic modeling with the selected factors was conducted with vaccination status and the demographic characteristics of families as independent factors. Type of Residence, Region and Wealth Index were the only significant characteristic in predicting the likelihood of a child being vaccinated when controlled for other factors (8).

The percent of 12-23 months old children who were fully vaccinated (card plus history) was 75.5% (83/110), while only 41.8% (46/110) were validly fully vaccinated. The percent of all age groups (0-23 months) validly vaccinated for age was 50.9% by card, and 72.7% by card plus history. The fully vaccinated coverage among children 12-23 months was higher for literate compared to illiterate mothers (card plus history). Fully vaccinated coverage was higher in rural than in urban areas, 56 (80%) and 27 (67.5%) (24).

Measles defaulter rate among 12-23 months old children of rural district of Ethiopia was 23.9%. The main reasons given by mothers for defaulting included lack of awareness on vaccination or need for subsequent dose (41.5%), lack of motivation (17.6%), family problems (11.8%), unavailability of vaccination service or inconvenient time of vaccination

(11.8%), mother too busy (5.9%), fear of side effects (5.9%) and place of immunization too far (5.9%) (24).

Knowledge on the time for the first dose of polio vaccine is low. Proportion of respondents who reported immediately at birth varies from Region to Region. Overall 21.5% of the respondents said immediately at birth. In all Regions, except *Gambella* and *Afar*, larger proportion of respondents mentioned that a baby needs to receive the first dose of polio vaccine when he/she is older than four weeks. For the total about 18% of the respondents don't know the time for the first dose of polio vaccine (17).

Children in rural areas are more likely to be missed by vaccination than those from urban areas. The survey results indicated that 58.6% of children from rural areas had been immunized compared to 49.5% living in urban areas. Among partially immunized children there was minimal difference between those living in urban and those in rural areas. In urban areas travel distances and availability of services resulted in children being more likely to be fully immunized than their counterparts from rural areas, where 29% of children were fully immunized against 22% from rural areas. The survey noted that 49.8% of reasons for failure were due to obstacles and 28.6% and 21.7% were due to lack of information and obstacles respectively (25).

The national immunization coverage assessed most common reasons given by parents or caretakers for not immunizing 12-23 months of children were; unaware of need for immunization, unaware of need to return for subsequent doses, vaccine not available, mothers too busy, vaccinator absent, place and time of vaccination session unknown, fear of side reactions and vaccination time and place not convenient (18).

The DPT 1 coverage is approximately 44 percent in Ethiopia, which means that the drop-out rate between DPT 1 and DPT 3 is 23 percentage points. Significant differentials by residence (urban/rural), birth order of the child, mother's education, wealth quintiles, and region are observed. The difference between urban and rural areas is around 30 percentage points, except for children receiving any single vaccine because of the fairly wide polio vaccination coverage. Immunization levels are significantly lower in children with higher birth orders. Immunization levels are higher among children whose mothers are educated and highest

among children with mothers having at least secondary or higher education. Children from poorer households have lower immunization coverage (26).

Majority of mothers and immediate caretakers (78.8%) had positive attitude toward health institution support. Most of the respondents (76%) believed that immunization was beneficial for their children in preventing the occurrence and spread of diseases. 418 (41.7%) of children had taken all the recommended immunization. Whereas 412 (41.5%) and 171 (17%) of the children were partially immunized and never vaccinated respectively. The evidences of vaccination for majority of children (77%) was interview and only 60(22.7%) of the children had vaccination card. Similarly, the majority of evidences of vaccination (86.4%) among the cases were history. In the final logistic regression model, the study identified that monthly family income, postponing of child immunization schedule, perceived health institute support, knowledge about measles and benefits of vaccination were the independent predictors. Mothers who had poor knowledge about the benefit of vaccines were 6 times more likely to have defaulter children than mothers, who had good knowledge, [OR = 6.3, (95%CI: 1.24, 9.53)]. Similarly, mothers who had negative perception towards health institution support were 2.3 times more likely to have defaulter children than mothers with positive attitude, OR = 2.3 [95%CI: 0.67, 7.6] (27).

Dropout Rate

The vaccination rate varied among series of vaccines. The BCG vaccination rate was 87% in the total children (cases and controls) and 73.5% among the cases. Similarly, measles vaccination rate was 58.7% in total children (both cases and controls) & 17% among the cases. The BCG: measles dropout rate for total children was 32.3% and the dropout rate among the cases was 76.2%. Of the total mothers/caretakers, 108 (40.9%) took their children to health institution for health and health related services other than immunization. Most of the mothers and immediate caretakers 95 (87.2%) took their children to health institution to seek help for some kind of illnesses. The rest of them took their children for growth monitoring and follow up. However; only 54.1% respondents were advised or informed about vaccination during their visit. The missed opportunity rate was 46.3 % (27**).**

The national immunization coverage weighted DPT1 to DPT3 and DPT1 to measles dropout rates were 21.7% and 35.6% respectively (card plus history) (18). According to the coverage survey conducted in Somaliland the immunization system management (drop-out rates) of BCG-Measles (card or history) was 32.8%, DPT1-Measles (card or history) 28.1%, BCG-DPT3 (card or history) 30.3% and drop-out rates for DTP1-DPT3 (card or history) was 25.4%(25). According EDHS, 2011 the BCG-measles and penta1-penta3 defaulters are 16% and 43% respectively. In the same analysis in *Benshangul Gumuz* the penta1-penta3 defaulter shows 38 % (4).

2.1. Conceptual frame work

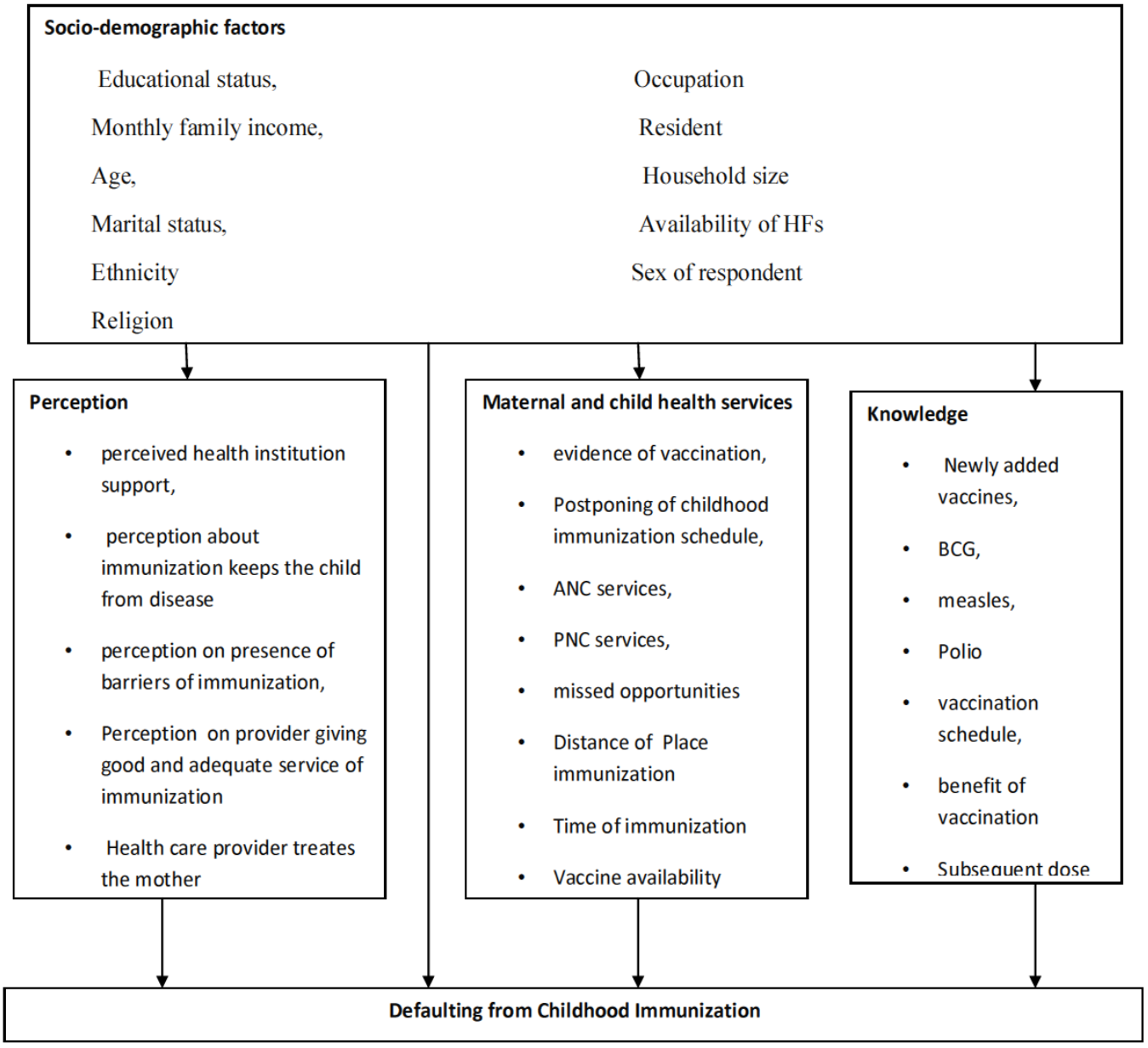

Figure 1: Conceptual framework of risk factors of defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz*, Western Ethiopia

2.2. Significance of the study

Increasing immunization coverage to develop herd immunity and reducing risk factors for defaulting from childhood immunization is widely recognized as a priority strategy for reducing child mortality, and rates of immunization antigens are being used as the target indicator to measure progress toward the 4th Millennium Development Goal of improving child health. In Ethiopia especially in the region, complete immunization rate is low and reasons for defaulting from childhood immunization are not studied well. Even little is known about which individual or health system characteristics most influence the immunization services. It is therefore, found imperative that a pertinent study must be conducted to elucidate some of the factors that affect immunization practices.

So, this study determines the possible risk factors of defaulting from childhood immunization and contributes to draw comments for childhood immunization policy and strategy implementation at the grass root level and to design another strategy to protect the defaulted children's above the recommended age for immunization from infectious diseases.

It will be used to overcome or protect the next generation childhood from defaulting of immunization and helps` for further planning to tress the childhood immunization defaulters for those who on the recommended age. It will also be advocate the political leaders to ensure their right commitment towards the immunization services and to put their directions for service providers and to make harmonization and alignment with partners and stakeholders to improve the access and utilization of immunization activities to avoid the defaulting from childhood immunization. This can show for service providers about their implementation gap and they use it as a baseline for their next childhood immunization program.

Generally this study will potentially encourage wider debate on how to improve immunization services among practitioners, *programme* managers, policy makers and academicians. It paves the road for generating better information for better decision making in the future. It is also hoped that the results will improve policies and health promotion efforts around childhood vaccination uptake and serve as a tool for increasing utilization of existing EPI efforts that will allow *Benshangul Gumuz* as well as Ethiopia to achieve MDG 4.

3. Objectives

3.1 . General objective

- To identify risk factors for defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz, Western Ethiopia.*

3.2 . Specific objectives

- To determine the effects of socio-demographic variables on defaulting from childhood immunization in *Assosa Woreda*
- To determine maternal and child health services factors on defaulting from childhood immunization in *Assosa Woreda*
- To identify effect of Knowledge of mothers/caretakers on defaulting from childhood immunization in *Assosa Woreda*
- To identify effect of perception of mothers/caretakers on defaulting from child hood immunizationMethods and Materials in *Assosa Woreda*

4.1. Study area and study period

Benishangul-Gumuz Regional State is one of the nine regional states established in 1994 by the new constitution of Ethiopia that created a federal system of governance. The region is located in the western part of the country between 9.17 - 12.06 North latitude and 34.100 - 37.040 East longitude. The region has international boundary with the Sudan in the west and is bordered by the *Amhara* region in the north and northeast, *Oromia* in the southeast and *Gambella* in the south. The regional capital, *Asossa* is located at a distance of 675 km west of Addis Ababa.

The region has a total area of approximately 50,380 km2 with altitude ranging from 580 to 2,731 meters above sea level (masl). Agro-ecologically, it is divided into *Kolla* about 75% (lowlands below 1500 masl), *Woina Dega* about 24% (mid-land between 1,500-2,500 *masl*) and *Dega* about 1% (high land above 2,500 *masl*). Annual rainfall varies from 800 to 2000 mm. The temperature reaches a daily maximum of 20^0C to 25^0C in the rainy season and rises to 35^0C to 40^0C in the dry season. The hottest period is from February to April. The minimum daily temperatures range from 12^0C to 20^0C, depending on season and altitude. As per the 2007 census projected, the population of the region is 909,271 from which (50.7% are male

and 49.3% female). The annual population growth rate is estimated at 3% per annum with 13.5% and 86.5% living in urban and rural areas respectively.

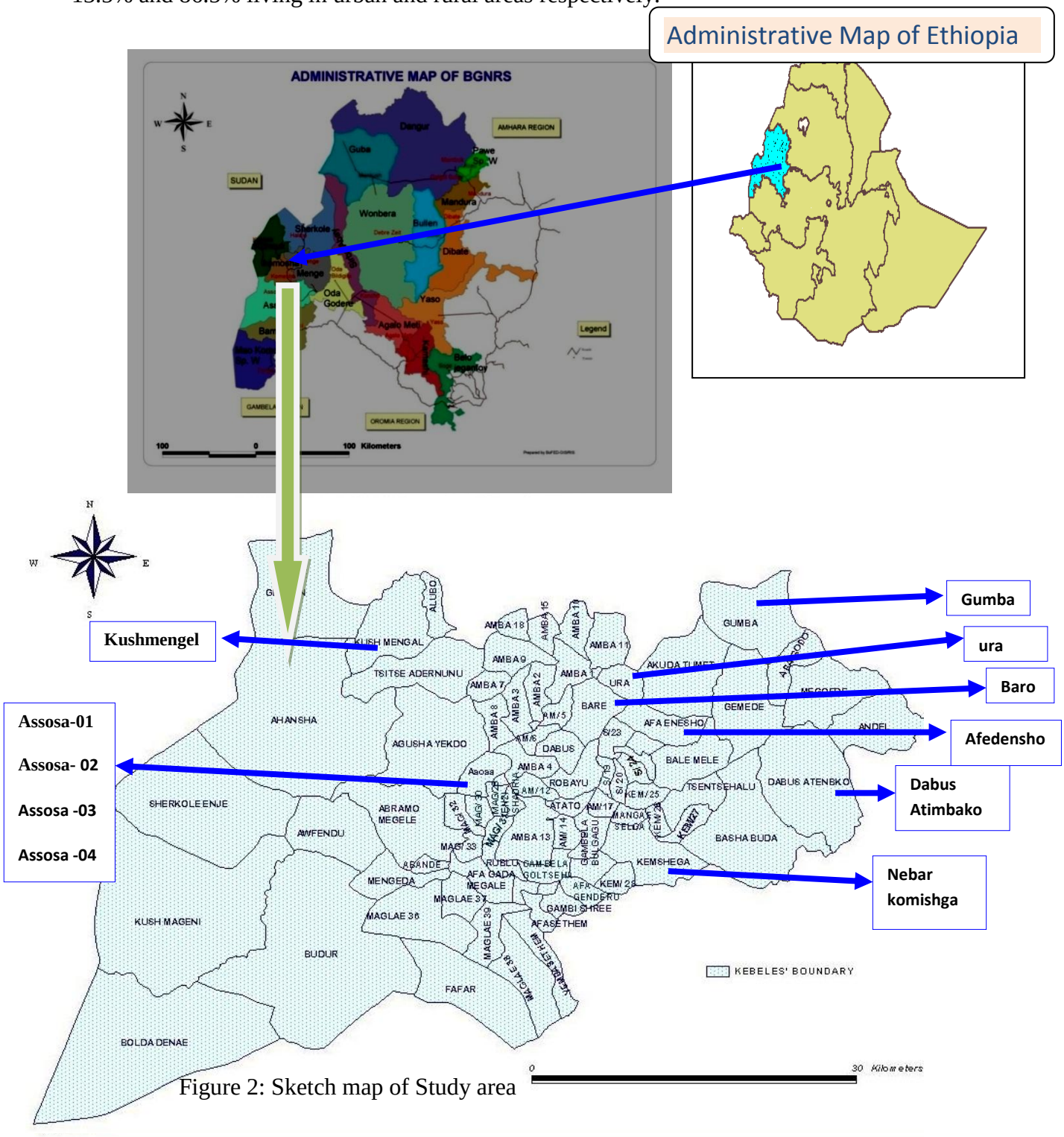

Figure 2: Sketch map of Study area

Assosa woreda is one of the 20 *woredas* in the *Benishangul-Gumuz* Region of Ethiopia. Part of the *Asosa Zone*, it is bordered by *Kurmuk* in the north, by *Menge* in the north east, by *Bambasi* in the southeast, and by Sudan in the west. It is one of the densely populous *Woreda* in the region. Population of assosa woreda is around 125,000 based 2007 census projected. The *Woreda* has 74 rural and 4 urban *kebeles* (the smallest administrative units in Ethiopia). The *Kebeles* in the *Woreda* were stratified into urban and rural settings. The *Woreda* has 3 functional health centres and more than 44 health posts with 64 health professionals, more than 138 rural health extension workers with no urban health extension workers, 11 rural health extension supervisors and around 74 community health promoters and more than 46 supportive staffs. The EPI coverage of the *woreda* in 2010/11 annual performance was indicated penta-3 coverage 66.2%, measles coverage 54.3% and fully immunized coverage 54.3% (28).

This study was conducted from *March 25 to April 25/2012* in *Assosa woreda, Benshangul Gumuz, Western Ethiopia.*

4.2. Study design

Unmatched case -control study was utilized.

4.3. Population

4.3.1. Source population

The source population was the total population of 12-23 months old children in *Assosa woreda, Benshangul Gumuz.*

4.3.2. Study population

The study population was 12-23 months old children in *Asossa woreda* which fulfils the definition of cases and controls.

Cases- were children in the age group of 12 to 23 months who did not complete the recommended schedule of immunization.

Controls – was defined as children who were in the age group 12 to 23 months and completed the recommended schedules of immunization which include Bacillus Chalmette Guerin (BCG), *pentavalent*, polio and measles vaccines.

Exclusion criteria - Children in the age group of 12 to 23 months who never been immunized the recommended immunization schedule.

4.4. Sample size and sampling procedures

4.4.1. Sample size determination:

The assumptions for the sample size calculation were: proportion of illiterate mothers or caretakers of 82% among the cases and 94.4% among controls [24], 80% power, 95% confidence level, 10% non-response rate and a case to control ratio of 1:2.Using EPI-Info 3.5.1 statistical software (CDC and Prevention, Atlanta, Auguest-2008),

Table 2: Determination of sample size using variables from different literatures to get the maximum sample size using EPI-Info, in *Assosa woreda*, *Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/ 2012

Factor	Proportions		Sample size	10% non-response rate	Total sample size	Remark
	cases	control				
Educational status of mothers or caretakers (24)	82%	94.4%	256	26	282	1st Maximum sample size
Monthly family income (27)	89.3%	72.7%	228	23	251	2nd maximum
Knowledge of mothers about schedule of vaccines (27)	67.7%	32.3%	78	8	86	4th >>
Attitude of mothers about health institution (27)	69.6%	30.4%	66	7	73	5th >>
Postponed vaccine schedule (27)	94.8%	5.2%	12	1	13	6th >>
Ever ANC Visit (27)	65%	35%	108	11	119	3rd >>

The total sample size was **282 (94 defaulters and 188 completed)**. Among many exposure variables, only the above variables were found with proportions and educational status was selected since it would give maximum sample size as compared to other variables.

4.4.2. Sampling procedures:

For this study, all 4 urban *Kebeles* and 7 rural *Kebeles* were randomly selected and included in the study. In the selected *Kebeles*, first baseline survey was done to identify cases and controls. This baseline survey was conducted in all the selected *kebeles* by the data collectors and supervisors that were selected for over all data collection. These data collectors were trained on how to do the baseline survey and data collection.

During the baseline survey the households which had partially immunized/defaulting, children who were in the age group 12 to 23 months and completed the recommended schedules of immunization were identified and recorded according to the definition of cases and controls. House marking was done with different codes/ signs. For households who had children in the age group 12 to 23 months and completed the recommended schedules of immunization code as (FI/2012✓), for households who had children in the age group 12 to 23 months and not completed the recommended schedules of immunization /defaulting (PI/2012✓). The total sample size was distributed to each *Kebele* based on proportional to size allocation. Using the sampling frame of cases and controls from the baseline survey, 94 cases and 188 controls were selected by simple random sampling technique from cases and controls separate

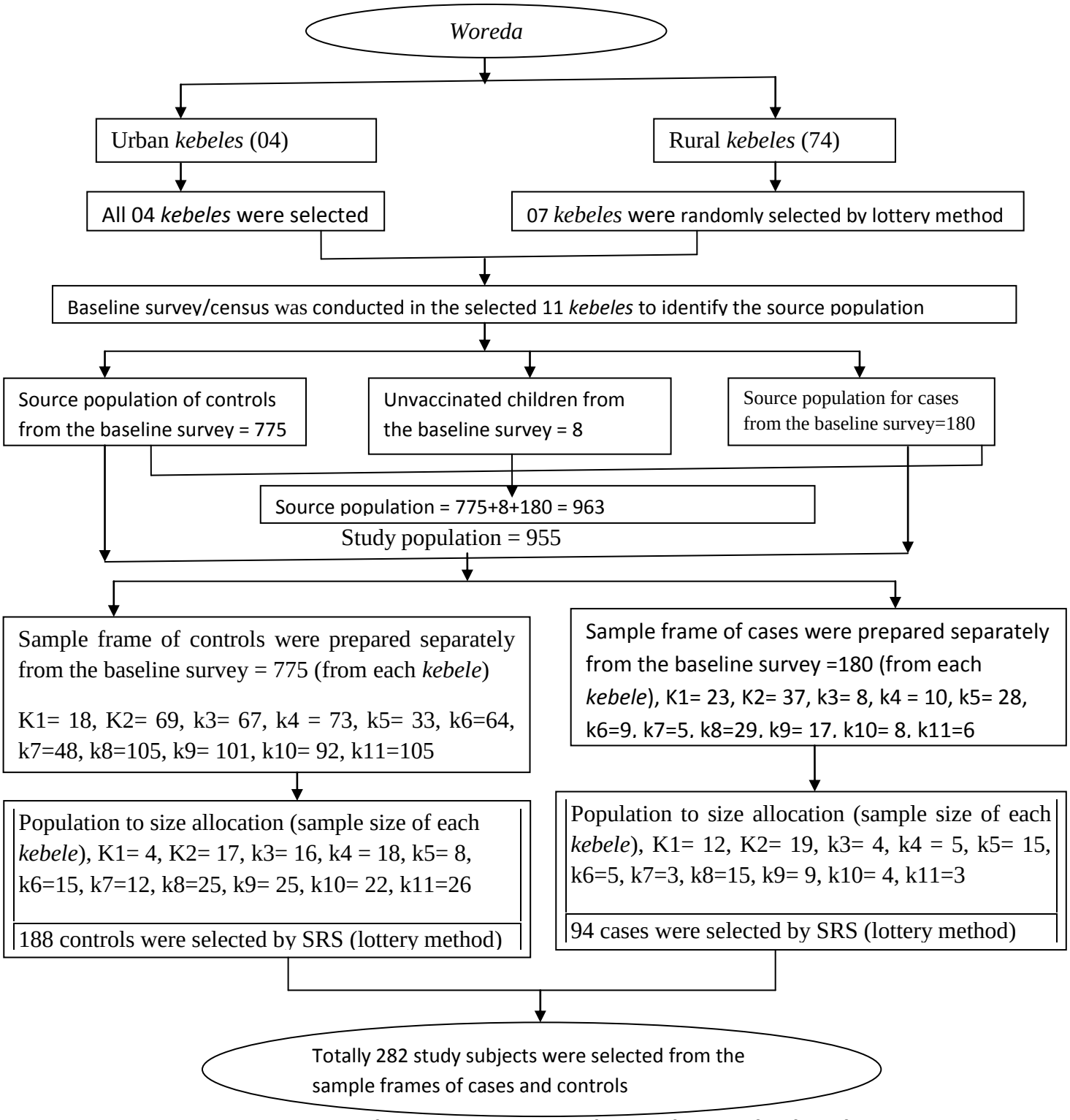

Figure 3: Schematic presentation of sampling procedures for risk factors of default from Childhood immunization

*k = kebele

4.5. Measurements

4.5.1. Instrument

Checklist was used for census as a tool to assess the number of children among 12-23 months old and their immunization status.

The structured questionnaire was adopted from world health organization (WHO) and Demographic health survey of Ethiopia (DHS). The content of the questionnaire included: socio-demographic variables (interviewing the mothers/ care takers about their age, educational status, family income, resident, household size and availability of health facilities to see their effect on defaulting from childhood immunization), questions related immunization status, risk factors associated to childhood immunization defaulting (Maternal and child health service risk factors, Perception and Knowledge of mothers as risk factors).

4.5.2. Study variables

Dependent variables

- Defaulting from Childhood immunization (completed, defaulted)

Independent variables

Socio demographic variables

- Educational status
- Monthly family income
- Age
- Marital status
- Religion
- Ethnicity
- Sex of respondent
- Occupation
- Residence
- Family size
- Availability of health facilities
- Sex of the child

Variables or risk factors of childhood immunization

Maternal and child health service factors

- Evidence of vaccination
- Postponing of childhood immunization schedule,
- ANC services,
- PNC services,
- Missed opportunities
- Distance of Place of immunization
- Time of immunization
- Vaccine availability
- Provider counseling system about importance of immunization

Variables related to knowledge measurement

- Vaccination schedule
- Newly added vaccines,
- BCG,
- Polio
- Measles,
- Benefit of vaccination
- Importance of subsequent dose
- Side reaction

Risk factors related to perception

- Perception on immunization keeps the child from disease
- perceived health institution support,
- perception on presence of barriers of immunization,
- Perception of provider on giving good counseling and adequate services.
- Health care provider treats the mother
- Satisfaction on the health institution

4.6. Data collection procedure

4.6.1. Data collection technique

Baseline survey was conducted to identify the cases and controls of the study. Based on the procedure mentioned above eleven data collectors and 3 supervisors were recruited to conduct the baseline survey and the main study in the randomly selected 7 rural *kebeles* and 4 urban *kebeles*. Two days training was given to data collectors and supervisors on how to make the baseline survey and the main study. Using Checklist as a tool the baseline survey was conducted through interview and observation of childhood immunization cards was made for cases and controls to fulfill the required sample size.

For the main study, the data was collected by Structured Questionnaire administered face to face interview and observation of the immunization cards of the children. The responsibility of the data collectors were collects the reliable data appropriately using the data collection tools and reported to supervisors daily. Supervisors were checked whether the questionnaire was correctly filled or not, monitored and reviewed daily activities of the data collectors, during the data collection. The data collectors and supervisors were rural health extension supervisors and woreda experts/officers respectively.

4.7. Data processing and analysis

The data was checked for its completeness, coded, edited, entered in to, cleaned and analyzed by SPSS version 16 for windows. Bivariate and multivariate regressions were used to identify the independent risk factors of default from childhood immunization. This was done by entering each independent variable separately into bivariate analysis. Then, variables, which showed statistical association with p-value of less than 0.25 on bivariate analysis, were candidates for the multivariate logistic regression model and entered to using backward LR logistic regression technique. In the multivariate regression model significant association were declared at p-value less than 0.05. Data was summarized using tables and graphs.

4.8. Ethical considerations

Ethical clearance to conduct the study was obtained from *Jimma* University College of Public Health and medical science Ethical review Committee. Permission to conduct the study in *Assosa woreda* was secured from *Benshangul Gumuz* Regional Health Bureau and *Assosa woreda*. Before data

collection, verbal consent was obtained from the respondents after clear explanation about the purpose of the study, confidentiality of the information was assured and privacy of the respondent was maintained and the data collection procedure was not having any harm to the study participant, and the community. Confidentiality, anonymity and privacy were fully guaranteed.

4.9. Data quality management

Before data collection properly designed data collocation tool were prepared in English version. The English version questionnaire was translated into Amharic which was the common language of the region. The Amharic version questionnaire was back translated to English to check for its consistency. Two days training were given to data collectors and supervisors. To maximize validity and reliability of the study instrument was pre-tested on 5% (14 sampled children) of the sample on similar population in the three *kebeles* of the study area called *Tsitse, Abrahamo and Komishga* 28. Clarity, completeness, consistency, and setting of time required to conduct was checked. Some unnecessary questions were excluded and missed questions were incorporated.

During data collection, supervisors were do close field supervision to overcome any mistakes from data collectors and they were report to the principal investigator daily. On each data collection day, 5 percent of the collected data were reviewed by principal investigator.

After data collection data was edited, checked, properly organized and analyzed using the above mentioned software according to the standard.

4.10. Dissemination of study findings

After the study was accomplished pertinent results and findings will be to *Jimma* university college of medical science and public health , local district and *zonal* health offices, district and *zonal* counselling offices, the regional health bureau and regional counselling office, Federal ministry of health, World health organization, the relevant stakeholders/partners, relevant policy makers, governmental and nongovernmental organizations, different community based projects in region and to other regions with pastoralist community, and also for publication

4.11. Operational definitions

Defaulted - If the child missed at least one of the recommended vaccines except polio zero, he/she were considered as defaulted.

Complete immunization - Complete immunization were considered if the child aged 12-23 months took all the recommended vaccines including BCG, *pentavalent*, polio (1-3) and measles vaccine before her/his 1st birthday.

Perception- Perceived health institution support, perception on the presence barrier of immunization, perception on satisfaction of immunization services in the health institution, perception about immunization was assessed using *Likert* Scale questions. Mean score for each constructs were computed and dichotomized into positive and negative. If respondents scored below the mean, he/she was labeled as having negative perception.

Dropout rate (DOR) - The rate difference between the initial vaccine (BCG or *Pentavalent* I) and the final vaccines (*Pentavalent* III or Measles).

- *Pentavalent I/Pentavalent* III Dropout rate = $\frac{[PI-PIII]}{PI} * 100$
- BCG/Measles Dropout rate = $\frac{[BCG-Measles]}{BCG} * 100$

Missed opportunity - If a child came to a health facility or outreach site, and did not receive the vaccination for which he or she was eligible; this was to be a "missed opportunity" for vaccination.

Satisfaction - Fulfilment of mothers/immediate caretaker wishes, expectations, or needs, or the pleasure derived from childhood immunization services in health care facilities were considered as satisfaction.

5. Results

Baseline survey identified 963 children in 12-23 months from which 775(80.5%), 180(18.7%) and 8 (0.8%) of them completed, defaulted and totally unvaccinated children from childhood immunization respectively. From the total 282 sampled age 12-23 months children, all the 282 children (94 defaulted and 188 completed) were included in the study with response rate of 99.87%. Females accounted 59.6% of the total children.

The evidences of vaccination for majority of children 133(70.7%) among completed and 58(61.7%) among defaulted children were interview/mother/care takers history (table 3). The immunization rate varied among series of vaccines. The BCG vaccination coverage both by card and history was 253(89.7%) in the total children (defaulted and completed) and 67(71.3%) among the defaulted children. Similarly, measles vaccination rate was 203(72.0%) in total children (both defaulted and completed) & 15(16%) among the defaulters. The BCG: measles dropout rate for 282 children was 19.8% and the dropout rate among the defaulted children was 77.6%. Most of the defaulted children were defaulted in measles followed by *pentavalent* and BCG antigens respectively (table3). The dropout rate of Penta-1: Penta-3 (both defaulted and completed) by card only was 7.8% respectively.

Table 3: Evidence of immunization services and immunization rate of each antigen among defaulters, in *Assosa woreda, Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/2012

		Defaulting status	
Variables		Defaulted (%)	Total (%)
Evidence of vaccination	vaccination card	36(38.3%)	91(32.3%)
	History	**58(61.7%)**	**191(67.7%)**
Child received BCG vaccination	Yes	**67(71.3%)**	**253(89.7%)**
	No	18(19.1)	18(6.4%)
	don't remember	9(9.6%)	11(3.9%)
How many times *pentavalent* vaccine the child received?	one times	10(10.6%)	10(3.5%)
	two times	**29(30.9%)**	**29(10.3%)**
	three times	**49(52.1%)**	**237(84.0%)**
	no immunized	6(6.4%)	6(2.1%)
Child received measles vaccination	Yes	15(16.0%)	203(72.0%)
	No	**73(77.7%)**	**73(25.9%)**
	don	6(6.4%)	6(2.1%)

5.1. Socio-demographic risk factors on defaulting from childhood immunization

From the total children, 90(47.9%) among completed and 63(67.0%) among defaulted were from the rural residents. 154(81.9%) among completed and 72(76.6%) among defaulted were female respondents. 182(96.8%) among completed and 90 (95.7%) among defaulted of the total respondents were married. 96(51.1%) among completed and 49(52.1%) among defaulted of the total respondents were in the age range of 25-34 years old followed by age range of 15-24 years old which accounts 63(33.5%) among completed and 27(28.7%) among defaulted children(table4). Majority of the respondents 105(55.9%) among completed and 66(70.2%) among defaulted were from the Berta ethnic and 133(70.7%) among completed and 82(87.2%) among defaulted were Muslim in religion. 56(29.8%) among the completed and 36(38.3%) among defaulted children of the total respondents had greater than five family members. Whereas, 132(70.2%) among completed and 58(61.7%) among defaulted children of the total respondents had less than five family members (Table 4).

The educational status of most of the respondents 120 (63.8%) who had completed children were literate, where as 50(53.2%) respondents who had defaulted children were illiterate. The occupation of 121 (64.4%) from the completed and 65(69.1%) from defaulted were house wives followed by 33(17.6%) from completed and 21(22.3%) from defaulted were farmers. The monthly family income among the completed children 115 (61.2%) were greater than four hundred fifty Ethiopian birr followed by two hundred up to four hundred fifty 55(29.3%) and less than two hundred 18(9.6%). Whereas, among the defaulted children the income of respondents were 24(25.5%) less than two hundred Ethiopian birr, 52(34.1%) from two hundred up to four hundred fifty and 38(40.4%) had greater than four hundred fifty birr of monthly family income. Most of the respondents 91(48.4%) among completed and 63(67%) among defaulted had health post availability in their *kebele* for immunization services followed by hospital and health center (table4).

On bivariate analysis, residence (rural) (p value=0.001), religion (Christian) (p value=0.03), family size (p value = 0.15), ethnicity (Berta) (p value = 0.013), educational status (illiterate (p value = 0.001), can read and write but no formal education (p value = 0.11)), occupation (p value = 0.05), monthly family income (<200 birr (p value = 0.001), 200-450 birr (p value = 0.05)), availability of health facilities (p value = 0.001) showed an association at p value < 0.25 (table 4).

Table 4: Socio-demographic risk factors on defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/2012

Variables	Defaulting status		COR (95%CI)	p-value
	Defaulted	Completed		
Residence				
Urban	31(33.0%)	98(52.1%)	**1**	
Rural	63(67%)	90(47.9%)	**2.21(1.30,3.71)**	0.001
Sex of the respondents				
Male	22(23.4%)	34(18.1%)	1.38 (0.76, 2.53)	0.29
Female	72(76.6%)	154(81.9%)	1	
Sex of the child				
Male	39(45.5%)	75(39.9%)	1.07 (0.65, 1.77)	0.80
Female	55(58.5%)	113(60.1%)	1	
Age				
15-24	27(28.7%)	63(33.5%)	0.84 (0.48, 1.48)	0.55
25 - 34	49(52.1%)	96(51.1%)	1	
35-44	17(18.1%)	24(12.8%)	1.39 (0.68, 2.82)	0.37
>=45	1(1.1%)	5(2.7%)	0.39 (0.05, 3.45)	0.40
Family size				
<5 members	58(61.7%)	132(70.2%)	1	
>=5 members	36(38.3%)	56(29.8%)	**1.46(.87,2.46)**	0.15*
Marital status				
Married	90(95.7%)	182(96.8%)	1	
Divorced	4(4.3%)	6(3.2%)	1.35 (0.37,4.89)	0.65
Religion				
Muslim	82(87.2%)	133(70.7%)	1	
Christian	12(12.8%)	55(29.3%)	**0.35 (0.18, 0.70)**	0.03
Ethnicity				
Berta	66(70.2%)	105(55.9%)	1	
Amara	11(11.7%)	44(23.4%)	**0.40(0.19, 0.82)**	0.013
Oromo	12(12.8%)	20(10.6%)	0.96 (0.44, 0.08)	0.91
Others	5(5.3%)	19(10.1)	**0.42 (0.15, 1.18)**	0.10

Educational Status				
Illiterate	50(53.2%)	57(30.3%)	2.63 (1.56,4.43)	0.001*
Can read and write but no formal education	4(4.3%)	11(5.9%)	**1.10 (0.33,3.62)**	0.11*
Literate	40(42.6%)	120(63.8%)	1	
Occupation		‘		
House wife	65(69.1%)	121(64.4%)	1	
Farmer	21(22.3%)	33(17.6%)	1.19 (0.63, 2.21)	0.59
Others	8(8.5%)	34(18.1%)	0.44 (0.19, 1.00)	0.05
Family monthly income				
<200 birr	24(25.5%)	18(9.6%)	**4.04 (1.98, 8.23)**	0.001*
200-450 birr	32(34.1%)	55(29.3%)	**1.76 (0.99, 3.11)**	0.05*
>450 birr	38(40.4%)	115(61.2%)	1	
Nearest health facilities				
Hospital	14(14.9%)	63(33.5%)	**0.32(0.17, 0.62)**	0.001
Health centre	17(18.1%)	34(18.1%)	0.72 (0.37, 1.40)	0.34
Health post	63(67%)	91(48.4%)	1	

***** *Indicates candidate variables for multiple regression which their P-value <0.25 in the bivariate results, COR = crude odds ratio, CI = confidence interval,*

5.2. Maternal and child health service risk factors on defaulting from childhood immunization

On bivariate analysis of the maternal and child health variables, evidence of vaccination (p value=0.13), mother postponing vaccine schedule (p value = 0.001), no antenatal care visit (p value = 0.001), no postnatal care visit (p value = 0.04), missed opportunity (p value = 0.227), time inconvenient for immunization (p value = 0.02), vaccine availability (p value = 0.02) and provider counseling system about importance of immunization (p value = 0.001) showed an association at p value < 0.25 (table 5).

Table 5: Maternal and child health service risk factors on defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/2012

Variables	Defaulting status		COR (95%CI)	p-value
	Defaulted	Completed		
Evidence of vaccination				
Card	36(38.3%)	55(29.3%)	**1.50(0.89,2.53)**	0.13*
History	58(61.7%)	133(70.7%)	1	
Postponed vaccine schedule				
Yes	30(31.9%)	12(6.4%)	**6.875(3.32,14.24)**	0.001*
No	64(68.1%)	176(93.6%)	1	
Antenatal care visit				
Yes	67(71.3%)	173(92.0%)	1	
No	27(28.7%)	15(8.0%)	**4.648(2.33,9.28)**	0.001*
Post natal care visit				
Yes	42(44.7%)	108 (57.8%)	1	
No	52(55.3%)	79 (42.2%)	**1.69(1.03,2.79)**	0.04*
Missed opportunity				
Yes	13(13.8%)	37(19.7%)	**0.66(0.33,1.30)**	0.227*
No	81(86.2%)	151(80.3%)	1	
Distance of place of immunization too far				
Yes	13(13.8%)	25(13.3%)	1.05(0.51,2.15)	0.90
No	81(86.2%)	163(86.7%)	1	
Time inconvenient for immunization				
Yes	23(24.5%)	24(13.0%)	**2.17(1.15,4.11)**	0.02*
`No	71(75.5%)	161(87.0%)	1	
Vaccine always available in the service area				
Yes	61(64.9%)	146(78.1%)	1	
No	33(35.1%)	41(21.9%)	**1.93(1.12,3.33)**	0.02*
Provider counselling system about importance of immunization				
Yes	38(40.4%)	130(69.1%)	1	
No	56(59.6%)	58(30.9%)	**3.30(1.97,5.53)**	0.001*

***** *Indicates candidate variables for multiple regression which their P-value <0.25 in the bivariate results, COR = crude odds ratio, CI = confidence interval,*

5.3. Knowledge of mothers/caretakers as risk factors on defaulting from childhood immunization

On bivariate analysis, knowledge on schedule of vaccines (p value=0.001), knowledge on newly added vaccines (p value = 0.001), knowledge on measles vaccine (p value = 0.001), knowledge on BCG vaccine (p value = 0.001), knowledge on schedule of polio vaccine (p value = 0.001), knowledge on benefit of vaccines (p value = 0.01), knowledge on importance of subsequent dose of vaccines (p value = 0.01) and knowledge on side reactions of immunization (p value = 0.001) showed all values positively associated with defaulting at p value < 0.25 (table 6).

Table 6: Knowledge as risk factors of defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/2012

Variables		Defaulting status		COR (95%CI)	p-value
		Defaulted	Completed		
Knowledge on schedule of vaccines	Yes	29(31.2%)	129(68.6%)	**0.21(0.12,0.35)**	0.001*
	No	64(68.8%)	59(31.4%)	1	
Knowledge on newly added vaccines					
	Yes	16(17%)	78(41.5%)	1	
	No	78(83%)	110(58.5%)	**3.46(1.88,6.37)**	0.001*
Knowledge on measles vaccine					
	Yes	52(55.9%)	154(82.8%)	1	
	No	41(44.1%)	32(17.2%)	**3.79(2.17,6.64)**	0.001*
Knowledge on BCG vaccine					
	Yes	13(14%)	71 (37.8%)	1	
	No	80(86%)	117 (62.2%)	**3.73(1.94, 7.20)**	0.001*
Knowledge on schedule of polio vaccine					
	Yes	31(33.3%)	127(69.0%)	1	
	No	62(66.7%)	57(31.0%)	**4.46(2.62,7.59)**	0.001*
Knowledge on benefit of vaccines					
	Yes	84(89.4%)	184(97.9%)	1	
	No	10(10.6%)	4(2.1%)	**5.48(1.67,17.96)**	0.01*

Knowledge on importance of subsequent dose				
Yes	60(63.8%)	148(79.1%)	1	
No	34(36.2%)	39(20.9%)	**2.15(1.24,3.72)**	0.01*
Knowledge on side reactions of immunization				
Yes	64(68.1%)	165(87.8%)	1	
No	30(31.9%)	23 (12.2%)	**3.36(1.82,6.22)**	0.001*

***** *Indicates candidate variables for multiple regression which their P-value <0.25 in the bivariate results, COR = crude odds ratio, CI = confidence interval,*

5.4. Perception of mothers/caretakers as risk factors on defaulting from childhood immunization

On bivariate analysis, perception on immunization keeps the child from disease (p value=0.09), perceived health institution supports immunization (p value = 0.01), Perception on health provider giving good and adequate service of immunization (p value = 0.001), perception on health care provider treats the mother (p value = 0.04) and Perception for the satisfaction on immunization service in the health institutions (p value = 0.001) showed an association at p value < 0.25 (table 7).

Table 7: Perception of mothers/care takers as risk factors of defaulting from childhood immunization in *Assosa woreda, Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/2012

Variables	Defaulting status			
	Defaulted	Completed	COR (95%)	p-value
Immunization keeps the child from disease				
Positive				
Negative	89(94.7%)	185(98.4%)	**1**	
	5(5.3%)	3(1.6%)	**3.46(0.81,14.8)**	0.09*
Health institution supports immunization				
Positive	84(89.4%)	184(97.9%)	**1**	
Negative	10(10.6%)	4(2.1%)	**5.48(1.67,17.96)**	0.01*
The existence of barriers of immunization				
Positive	45(48.4%)	94(50%)	1	
Negative	48(51.6%)	94(50%)	1.07(0.65,1.75)	0.80
Health provider giving good and adequate service of immunization				
Positive	65(69.1%)	175(93.1%)	1	
Negative	29(30.9%)	13(6.9%)	**6.01(2.94,12.26)**	0.001*
Health care provider treats the mother				
Positive	64(68.1%)	149(79.3%)	1	
Negative	30(31.9%)	39(20.7%)	**1.79(1.02,3.13)**	0.04*
Satisfaction on immunization service in the health institutions			**1**	
Positive	62(66.0%)	183(97.3%)	**18.89(7.05,**	
Negative	32(34.0%)	5(2.7%)	**50.61)**	0.001*

***** *Indicates candidate variables for multiple regression which their P-value <0.25 in the bivariate results, COR = crude odds ratio, CI = confidence interval,*

5.5. Independent predictors of defaulting from childhood immunization

Variables from bivariate analysis were family size, educational status and monthly family income from socio-demographic variables, evidence of vaccination, mother postponing vaccine schedule, antenatal care visit, postnatal care visit, missed opportunity, time inconvenient for immunization, vaccine availability and provider counseling system about importance of immunization from maternal and child health variables,

knowledge on schedule of vaccines, knowledge on newly added vaccines, knowledge on measles vaccine, knowledge on BCG vaccine, knowledge on schedule of polio vaccine, knowledge on benefit of vaccines, knowledge on importance of subsequent dose of vaccines and knowledge on side reactions of immunization from knowledge variables, perception to immunization keeps the child from disease, perceived health institution supports immunization, Perception to health provider giving good and adequate service of immunization, perception to health care provider treats the mother and Perception for the satisfaction on immunization service in the health institutions from perception variables were entered to multivariate analysis using back ward LR regression technique. The fitness of the model was checked by Hosmer and Lemeshow test (P value = 0.846) and probability of entry 0.25 and probability of removal 0.5 was used to have many variables from bivariate and keep a variable in a model because past experience shows that it is important.

On multivariate analysis, mother postponing vaccine schedule (p value = 0.001), antenatal care visit (p value = 0.040), time inconvenient for immunization (p= 0.039), no provider counselling (p = 0.015), knowledge on measles vaccines (p = 0.020), knowledge of schedule of vaccines (p = 0.001) and negative perception on the satisfaction of immunization service in the health institutions (p = 0.001) showed statistical significance association at p value < 0.05. Socio-demographic variables were not associated with defaulting from childhood immunization (Table 8).

Children whose mothers/caretakers did postpone vaccination schedule were 5.61 times more likely to default from childhood immunization than children whose mothers/caretakers were not ever postponed vaccination schedule [AOR = 5.61, 95%CI: 2.22, 14.16] (table 8).Children whose mothers/caretakers did not visit antenatal care services before delivery of the child under study were 2.89 times more likely to default from childhood immunization than children whose

mothers/caretakers did visit antenatal care services before delivery of the child, [AOR = 2.89, 95% CI: 1.05, 7.96]. Children, whose mothers/caretakers with inconvenient time for immunization were 2.85 times more likely to default from childhood immunization than children whose mothers/caretakers with convenient time for immunization, [AOR = 2.85, 95% CI: 1.05, 7.70]. Children whose mothers/caretakers did not get counseling on importance of immunization were 2.69 times more likely to default from childhood immunization than children whose mothers/caretakers did get counseling on importance of immunization [AOR = 2.69, 95% CI: 1.21, 5.99] (table8).

Children whose mothers/caretakers had no knowledge about measles vaccine Were 2.76 times more likely to default from childhood immunization than children whose mothers had knowledge about measles vaccine, [AOR = 2.76, 95%CI: 1.18, 6.49]. Children whose mothers/caretakers had knowledge about schedule of vaccines were 0.24 times less likely to default from childhood immunization than children whose mothers had no knowledge about schedule of vaccines, [AOR = 0.24, 95%CI: 0.11, 0.56].

Similarly, Children whose mothers/caretakers did perceive negatively on the satisfaction of immunization service in the health institutions were 16.69 times more likely to default from childhood immunization than children whose mothers/caretakers did perceive positively on the satisfaction of immunization service in the health institutions [AOR = 16.69, 95% CI: 4.06, 68.55] (table 8).

Table 8: Independent predictors of defaulting from CHI in *Assosa woreda, Benshangul Gumuz* Region, Western Ethiopia, March 25 to April 25/2012

Variables	Defaulting status		COR (95% CI)	p-value	AOR(95% CI)	P-value
	Defaulted	Completed				
Educational Status						
Illiterate	50(53.2%)	57(30.3%)	2.63 (1.56,4.43)	0.001*	2.29(0.99,5.24)	0.051**
Can read and write but no formal education	4(4.3%)	11(5.9%)	1.10 (0.33,3.62)	0.11*	0.57(0.04, 8.53)	0.68
Literate	40(42.6%)	120(63.8%)	1		1	
Family monthly income <200 birr						
200-450 birr	24(8.5%)	18(6.4%)	4.04 (1.98, 8.23)	0.001*	2.11(0.75, 5.96)	0.158
>450 birr	32(11.3%33	55(19.5%)	1.76 (0.99, 3.11)	0.05*	0.62(0.25, 1.56)	0.308
	8(13.5%)	115(40.8%)	1		1	
Postponed vaccine schedule						
Yes	30(31.9%)	12(6.4%)	**6.88(3.32,14.24)**	0.001*	**5.61(2.22,14.16)**	**0.001****
No	64(68.1%)	176(93.6%)	**1**		1	
Antenatal care visit						
Yes	67(71.3%)	173(92.0%)	1		1	
No	27(28.7%)	15(8.0%)	**4.648(2.33,9.28)**	0.001*	**2.89(1.05,7.96)**	**.040****
Time inconvenient for immunization						
Yes	23(24.5%)	24(13.0%)	**2.17(1.15,4.11)**	0.02*	**2.85(1.05,7.70)**	**0.039****
No	71(75.5%)	161(87.0%)	1		1	
Provider counselling system about importance of immunization						
Yes	38(40.4%)	130(69.1%)	1		**1**	
No	56(59.6%)	58(30.9%)	**3.30(1.97,5.53)**	0.001*	**2.69(1.21, , 5.99)**	**0.015****
Evidence of vaccination						
Card	36(38.3%)	55(29.3%)	**1.50(0.89,2.53)**	0.13*	1.97(0.85,4.58)	0.114
History	58(61.7%)	133(70.7%)	1		1	

Knowledge on measles vaccine						
Yes	52(55.9%)	154(82.8%)	1		**1**	
No	41(44.1%)	32(17.2%)	**3.79(2.17,6.64)**	0.001*	**2.76(1.18, 6.49)**	**.020****
Knowledge on BCG vaccine						
Yes	13(14%)	71 (37.8%)	1		1	
No	80(86%)	117(62.2%)	**3.73(1.94, 7.20)**	0.001*	1.57(0.60, 4.12)	0.358
Knowledge on schedule of vaccines						
Yes	29(31.2%)	129(68.6%)	**0.21(0.12,0.35)**	0.001*	**0.24(0.11,0.56)**	**0.001****
No	64(68.8%)	59(31.4%)	1		**1**	
Perception to health provider giving adequate service of immunization						
Positive	65(69.1%)	175(93.1%)	1		1	
Negative	29(30.9%)	13(6.9%)	**6.01(2.94,12.26)**	0.001*	2.16(0.72, 6.53)	0.172
Perception to immunization keeps the child from disease						
Positive	89(94.7%)	185(98.4%)	1		1	
Negative	5(5.3%)	3(1.6%)	**3.46(0.81,14.8)**	0.09*	0.30 (0.03,3.19)	0.315
Perception for the satisfaction on immunization service in the health institutions						
Positive	62(66.0%)	183(97.3%)	1		1	
Negative	32(34.0%)	5(2.7%)	**18.89(7.05, 50.61)**	0.001*	**16.69(4.06,68.55)**	**0.001****

***** *Indicates candidate variables for multiple regression which their P-value <0.25 in the bivariate results*
***** *Indicates significant independent predictors (p-value <0.05) of defaulting from childhood immunization after adjusting all the study variables,*
COR = crude odds ratio, CI = confidence interval, AOR = adjusted odds ratio

6. Discussion

All the study rural and urban *kebeles* had available health facilities and all of the households had health facilities in their *kebeles* which gave childhood immunization services. However, significant proportion of children 180(18.7%) didn't complete the WHO recommended vaccination/immunization schedule. This was lower than the findings conducted in south Ethiopia, in Benin City Nigeria and in South Western Nigeria which was identified 42%, 27.6% and 22.4% respectively children didn't complete the recommended immunization schedule (23, 27, 35). The difference might be due to the strong health extension program currently implemented in Ethiopia with great attention of immunization services and the *villegization* program currently implemented in the pastoralist areas contributed to reach the people at hot spots. The implication of having partially immunized or defaulted children from childhood immunization in an area could face to vaccine preventable infectious diseases.

The immunization rate on completed and defaulted children varied among series of vaccines. The BCG, measles and penta-3 vaccination rate both by card and mothers/immediate care takers history was 89.7%, 72.0% and 84% respectively in the 282 children (defaulted and completed). These results were higher as compared to findings conducted in national EDHS result BCG 66.3%, measles 56%, penta-3 36.5%, health Sector Development Program IV BCG 83.4%, measles 54.3%, penta-3 66%, Ethiopian demographic health survey (EDHS) disaggregate result of *Benishangul Gumuz* region 68.7% BCG, 67.2% measles, 41.7% penta3 and similar study conducted in southern Ethiopia BCG 87%, measles 58.75% respectively. Children were got three times of *pentavalent* vaccine rate on both (defaulted and completed) was higher than the DPT-3/pentavalent-3 coverage of global 78% and WHO's African region 69% (4, 9, 19, 27). For the greater result of immunization rate than other literatures might be due to the existing program of health extension which had great contribution for acceleration of the immunization program and increased the awareness of the community on the benefit of childhood immunization. As EDHS 2011, indicated the immunization rates most of the antigens increased from the last five years in the country (4).

The BCG: measles dropout rate for 282 children (both completed and defaulted) in this study (19.8%) was higher as compared to the EDHS, 2011 study, which was 16% (4). However, it is lower than that of the similar study conducted in south Ethiopia (32.3%) (27). And immunization coverage survey in

Somaliland (32.8%) (25). The BCG: measles dropout rate among the defaulted children was 77.6%. This result was higher as compared to the study conducted in south Ethiopia, which was 76.2 % (27). Even though the dropout rate of BCG: measles result was below some literatures, this might be due to the expansion of primary health care facilities, implementation household and community based packages through health extension program. But, per the WHO recommendation the dropout rate of childhood immunization should not be greater than ten percent. It is important to check the access and utilization of childhood immunization services.

All children's have equal right to get all the introduced immunization antigens in Ethiopia below the age of one year. But due to the existence of risk factors related to maternal and child health services and socio- behavioral (knowledge, perception) the access and utilization of the immunization services are affected and the success becomes below the expected. This study identified several risk factors that affected childhood immunization.

The most important identified independent predictors of the child defaulting from childhood immunization after adjusting all variables of the study postponing of childhood immunization schedule, antenatal care visit, time inconvenient for immunization, no provider counseling system, knowledge about measles, knowledge about schedule of vaccines and Perception on the satisfaction of immunization service in the health institutions were found to be the most important predictors of defaulting from childhood immunization.

The similar study conducted in south Ethiopia was identified the important variables that predicted defaulting from childhood immunization were perceived health institution support, monthly family income, postponing childhood immunization schedule and knowledge of mothers on the benefit of immunization. From which postponing of childhood immunization schedule was similar with this study, others were not significant in the multivariate regression model. In the study of factors influencing child immunization coverage in a rural district of Ethiopia, the main reasons given by mothers for defaulting included lack of awareness on vaccination or need for subsequent dose, unavailability of vaccination service or inconvenient time of vaccination, fear of side effects and place of immunization too far (24, 27).

Socio-demographic variables were not associated with defaulting from childhood immunization. This was different as compared to the study conducted in south Ethiopia which was identified only monthly family income was the predictor of defaulting from childhood immunization. However, it was similar with the study conducted in south western Nigeria which was identified immunization of the children was not significantly associated with the socio-demographic characteristics (23).

Children whose mothers/caretakers did postpone vaccination schedule were 5.61 times more likely to default from childhood immunization than children whose mothers/caretakers were not ever postponed vaccination schedule [AOR = 6.44, 95%CI: 2.22, 14.16]. This study was similar with the study conducted in south Ethiopia which identified postponing child immunization schedule was a predictor of completion of childhood immunization (27). This might be due to poor awareness of mothers/ immediate caretakers on the importance of timely vaccination.

Children whose mothers/caretakers did not visit antenatal care services before delivery of the child under study were 2.89 times more likely to default from childhood immunization than children whose mothers/caretakers did visit antenatal care services before delivery of the child, [AOR = 2.89 , 95% CI: 1.05, 7.96]. This was different as compared the study conducted in south Ethiopia which was identified insignificant [AOR = 1.01, 95% CI: 0.117, 8.721]. However, it is similar with the study conducted in Ambo *woreda*, Central Ethiopia which identified antenatal care follow-up was significantly associated with defaulting (AOR = 2.4, 95% CI: 1.2- 4.9) and the study conducted in South Nigeria which was identified mothers got their awareness of immunization at the antenatal care clinic (27, 23, 33). This might be due to poor knowledge of mothers/immediate caretakers, lack of continuous information, education and communication for mothers, poor counseling about its importance, poor facility readiness and poor provider motivation.

Children, whose mothers/caretakers with inconvenient time for immunization were 2.85 times more likely to default from childhood immunization than children whose mothers/caretakers with convenient time for immunization, [AOR = 2.85, 95% CI: 1.05, 7.70]. This was similar with different studies which identified inconvenient time for childhood immunization was a factor for child defaulting from childhood immunization (18, 24). This implies the time of childhood immunization

days determines the child to default or to complete the WHO recommended childhood immunization schedules. This might be due to low awareness of mothers, poor IEC, the immunization day might not be decided by the agreement of the community specially mothers or immediate caretakers.

Children whose mothers/caretakers did not get counseling on importance of immunization from providers were 2.69 times more likely to default from childhood immunization than children whose mothers/caretakers did get counseling on importance of immunization from providers [AOR = 2.69, 95% CI: 1.21, 5.99]. This was similar as compared with the study conducted in South Western Nigeria which was identified immunization was significantly associated with recommendation from health care professionals and which implies there was Poor treatment or counseling from health staffs (23, 31). This might also be due to missed opportunities and weak motivation of health care providers.

Children whose mothers/caretakers had no knowledge about measles vaccine Were 2.76 times more likely to default from childhood immunization than children whose mothers had knowledge about measles vaccine, [AOR = 2.76, 95%CI: 1.18, 6.49]. This was similar as compared with the study conducted in South Ethiopia [AOR = 84.89, 95%CI: 8.220, 876.883]. Their difference was the confidence interval of the study conduct in South Ethiopia showed very wide and was not as strong as this study. This implies the knowledge of mothers/caretakers towards vaccination antigens determines to child default or completes the recommended immunization antigens. A study conducted in Kinshasa, Democratic Republic of Congo was identified many mothers attended immunization sessions without knowing exactly for which vaccines they were there (27, 33). This might be due to lack of continuous health education, poor counselling system during immunization days about the importance of each antigen given to the child.

Children whose mothers/caretakers had knowledge about schedule of vaccines were 76% times less likely to default from childhood immunization than children whose mothers/caretakers had no knowledge about schedule of vaccines, [AOR = 0.24, 95%CI: 0.11, 0.56]. This was similar with the study conducted in peri-urban Karachi, Pakistan which was identified better the knowledge of mother, greater the likelihood that child would be appropriately vaccinated and different as compared with the study conducted in South Ethiopia(27, 32). As the WHO recommendation the Ethiopian

vaccination schedule which is, at birth BCG and polio-0, at 6th week, polio-1 and *pentavalent-1,* at 10th week, polio-2 and pentavalent-*2*, at week 14th polio-3 and *pentavalent-3*, at 9 month measles might not be appropriately promoted to the community, poor immunization counseling at facility level and the health extension implementation program might also be weak.

Children whose mothers/caretakers did perceive negatively on the satisfaction of immunization service in the health institutions were 16.69 times more likely to default from childhood immunization than children whose mothers/caretakers did perceive positively on the satisfaction of immunization service in the health institutions [AOR = 16.69, 95% CI: 4.06, 68.55]. This result was similar with the study Rates of coverage and determinants of complete vaccination of children conducted in rural areas of Burkina Faso which identified respondents who were not satisfied with the childhood immunization services were more likely to leave the programme compared to in satisfied respondents. This might be due to Poor treatment or counseling from health staff, Poor injection technique causing pain or side-effects mistrust of government vaccinators, curative services aren't provided (nor material aid) facility is overcrowded: long wait, service rushed (29, 30, 31).

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7. Strengths and Limitations

7.1. Strengths of the study

Baseline survey was conducted and separate sampling frame of cases and controls were prepared, finally random selection of cases and controls was done separately. Method used for the case control studies is powerful in producing reliable information for the objective. In *Benishangul Gumuz*, case control study on childhood immunization has never been conducted. Therefore, this study encourages the region to conduct such studies and further intervention for the predictors of defaulting from childhood immunizations. To reduce social desirable bias the data collectors who were the health extension supervisors were assigned outside their cluster area during the baseline survey and data collection of the main study.

7.2. Limitations of the study

This study had some limitation which included recall bias where mothers/caretakers who had no Vaccination cards might forget the specific antigen of immunization administration of their children. Because some mothers/caretakers who had measles immunized child at nine month might responded the child was completed the recommended childhood immunization without rehearsing whether each antigen was taken or not.

8. Conclusion and Recommendations

8.1. Conclusion

This study was tried to identify risk factors of defaulting from childhood immunization using the unmatched community based case-control study. Especially this study was identified that maternal and child health services, knowledge and perception of mothers/immediate caretakers had contributed for defaulting from childhood immunization. It is concluded that Variables, postponing of childhood immunization schedule, no antenatal care visit, time inconvenient for immunization, no counseling on importance of immunization by vaccination providers, no knowledge about measles vaccine, no knowledge about schedule of vaccines and negative Perception on satisfaction of immunization service in the health institutions were the most important independent predictors of defaulting from childhood immunization.

8.2. Recommendation

Based on the findings the following recommendations were given:

Federal Ministry

- **D**esign an intervention strategy to trace and protect the defaulted children's above the recommended age of immunization schedule to prevent from vaccine preventable infectious diseases in *Benishangul Gumuz* region and other emerging regions.
- Support the region to prepare guideline and electronic education materials on importance of immunization, disadvantage of defaulting from childhood immunization, vaccination schedule by local languages to change the knowledge and perception of the mothers/caretakers, community in general.
- To overcome these infectious diseases the policy should consider on how to trace the defaulted children above the recommended age of immunization schedule in the country.

Regional health bureau

- Prepare and distribute information, education and communication materials to increase the knowledge and perception of mothers/caretakers.

- The role of antenatal clinic as a source of awareness should further be strengthened by short term training more health care workers to give satisfactory services to mothers since majority of mothers/caretakers could get information about childhood immunization in the antenatal clinic.
- The necessary logistics or commodities, trained and ethical professionals should also secured in all immunization posts to satisfy the mothers/caretakers to avoid defaulting from childhood immunization.
- Since childhood immunization is a population level service, *committements* of political leaders should ensure for its sustainability and uninterrupted implementation without defaulting from the recommended childhood immunization.
- **D**esign an intervention strategy to trace and protect the defaulted children's above the recommended age of immunization schedule to prevent from vaccine preventable infectious diseases.

***Woreda* health office, health facilities and *kebeles* level**

- Providing adequate Information, Education and communication (IEC) on immunization services and their benefit in order to bring knowledge as well as behavioral change to the mothers/immediate caretakers and over all the community to attend the regular routine vaccination schedule without postponing.
- Enhancing the routine immunization by expanding immunization posts through increasing the static, outreach and mobile strategies of childhood immunization program
- Invite Partners like WHO, UNICEF, Core group Ethiopia to design an intervention project to trace and protect the defaulted children's above the recommended age of immunization schedule to prevent and protect them from vaccine preventable infectious diseases.
- The community **s**hould agreed on the time of immunization day to make convenient for all mothers,
- Pregnant mothers should attend the antenatal care services and know they have the right to get immunization counseling on this department,
- Don't postponing the immunization services, mothers should be attended immunization sessions and should know exactly for which vaccines they are there.
- Accept and implement all the assignments given by health extension workers about immunization package and other maternal and child health services.

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Annexes

Annex 1: Data collection instruments

Oral informed consent

Hello! Good morning/Good afternoon! My name is _____. I came from *Assosa Woreda* . I am asking you to take part in a study being conducted by student of *Jimma* University to assess the risk factors for defaulting from childhood immunization. Immunization is important to prevent vaccine preventable around 8 different diseases for children. If one child does not get this chance it faces to different diseases and can loss its life. To avoid the child disease and death improving immunization status is very important. That is why this study is important to take correct measures on poor immunization status. So, we want to be sure that you understand the purpose of the study and your responsibilities in the research before you decide if you want to take part or decline. Please ask us to explain any words or information that you may not understand.

If you agree to participate in the study, we will ask you about your experiences or opinions in relation to what Risk factors for defaulting from completion of childhood immunization. The interview may take not more than 15 minutes. This study is planned to collect data from mothers/care-takers that have children 12-23 months.

Please feel free to refuse to answer any of the questions, if you are uncomfortable. There is no direct benefit you get as a result of your participation in this study. However, the information we get from you will help us to make necessary intervention to improve the immunization status of children. You will not be paid or given gifts worth as a result of your participation in this research study. We will thank you for your participation. You are free to decide if you want to be in this research or not. If you decide not to participate in the research, your decision will not affect you in any way.

The information you provide us will be kept in a lockable cabinet and access to the records will be restricted to the researcher/ investigator. You may end the interview at any time. If you do, it will not affect you in any way.

If you have any question, you may ask now. If you wish to ask latter, please contact the principal investigator of this study. This research has been commented and supported by advisors (*Mr. Fasil Tessema and Mr. Desta Hiko*) and reviewed by *Jimma* University Ethical Review Board.

AGREEMENT

I, the respondent, certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to me. Depending on these facts, I decide to participate_____ signature_____, I do not decide to participate _____signature_____

_____ _____ _____

Name of interviewer Signature Date

English version questionnaire

I. Identification

Interview number: _____

Date of the interview: _____/_____/_____

Region_____ zone _____ *woreda* _____

kebele _____

House number: _____

Name and signature of supervisor:
_____

Date reviewed ____/_____/_____

Part I. Socio-demographic characteristics and factors

No.	Question	Coding (circle the number chosen)
1.	Residence	Urban ____1 Rural ____2
2.	Household size /Family size of the respondent	Males _____ Females _____
3.	Religion of the respondent	Orthodox ____1 Muslim ____2 Protestant ____3 Catholic ____4 Others(specify) ____5
4.	Ethnicity of the respondent	Berta ____1 Gumuz ____2 Shinasha ____3 Amhare ____4 Oromo____5 Tigrie ____6 Others(specify)____7
5.	Marital status of the respondent	Married ____1 Single ____2 Divorced ____3 Widowed ____4 Separated ____5
6.	Sex of respondent	Male ____1 Female ____2
7.	Relation of the respondent to the child?	Mother____1 Sister____2 Father____3 Grandmother___4 other(specify) ____5

		Respondent (wife)	Husband /other immediate caretaker
8.	Age of the respondent completed years		
9.	Educational status of the respondent	• Cannot read and write__1 • Can read and write but no formal education____2 • Elementary (Grade 1-8) _____.3 • High school (Grade 9-12) ____4 • Above high school ____5	• Cannot read and write____1 • Can read and write but no formal education__2 • Elementary (Grade 1-8) ____3 • High school (Grade 9-12).4 • Above high school ____5
10.	Occupation of the respondent	Farmer____1 Merchant____2 Government employment____3 Private employment____4 House wife ____5	Farmer____1 Merchant____2 Government employment____3 Private employment____4 Other (specify) ____5
11.	Type of health facility available in the village/kebele (consider the nearest health facility)	Hospital ____1 Health center ____2 Health post ____3 Other (specify) ____4	
12.	Monthly income of the respondents?	Income in Ethiopian Birr _____	

Part II. Immunization status, Instruction:

For question No 1-9 below:

- If there are two or three children living in same house which were recorded in the census, record below the ages of the children beginning with the youngest one, even if they are not siblings but live in the same house. When finished asking questions pertaining to the first child, continue to the second child in age and repeat the same questions asked of the first child

No	Question	Coding (circle the number chosen)		Go to…
		Youngest child (of at least 12 mos.)	Next youngest child (older than the 1st child)	Third youngest child (older than the 2nd child (of at most 23 months)
1	Sex of the child?	Male_____1 Female_____2	Male_____1 Female_____2	Male_____1 Female_____2
2	Do you have a vaccination card for NAME? IF YES, May I please see it?	Yes, seen____1 Yes, not seen___2 No card_____3	Yes, seen_____1 Yes, not seen____2 No card____3	Yes, seen_____1 Yes, not seen_____2 No card_____3

For question No 3 below:

1) Copy vaccination date from card for each vaccination date)
2) write 44 in day column if card indicates that vaccination was given but does not indicate date

		Youngest child (of at least 12 mos.)	Next youngest child (older than the 1st child)	Third youngest child (older than the 2nd child (of at most 23 months)
3		M M D D Y Y Y Y	M M D D Y Y Y Y	M M D D Y Y Y Y
	BCG			
	OPV0			
	OPV1			
	OPV2			
	OPV3			
	PENTVALENT1			
	PENAVALENT2			
	PENTAVALENT3			
	MEASLES			
4	Does the child received BCG vaccination against tuberculosis?	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3
5	Does the child received Polio vaccine?	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3
6	How many times was the polio vaccine received?			
7	Does the child receive *pentavalent*	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3

	vaccination?			
8	How many times was a pentavalent vaccination received?			
9	Does the child received measles vaccination at nine month?	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3	Yes____1 No____2 don't remember____3

Part III. Questions on Risk factors associated to childhood immunization defaulting

No	Question	Coding (circle the number chosen)	Go to…
Maternal and Child health Services factors Questions			
1	Did mother Postpone the vaccine schedule?	Yes_____1 No _____2	
2	Did mother follow ANC?	Yes_____1 No _____2	
3	Does currently mother visit post natal care services?	Yes_____1 No _____2	
4	What is the evidence of your vaccination?	vaccination card _1 History_____2	
5	Does the distance of Place of immunization too far?	Yes_____1 No _____2	
6	Does time of immunization inconvenient?	Yes_____1 No _____2	
7	Does vaccine available always in the service area?	Yes_____1 No _____2	
8	Did any condition you were faced child ill brought to the health facility but not given immunization service?	Yes_____1 No _____2	
9	Does the provider told you about the importance of immunization?	Yes_____1 No _____2	
3.2. Perception Questions			
1	Do you perceive/think health institution supports immunization?	Strongly Agree _____1 Agree_____2 Neutral _____3 Disagree _____4 Strongly disagree _____5	
2	Do you perceive the existence of barriers of immunization?	Strongly Agree _____1 Agree_____2 Neutral _____3 Disagree _____4 Strongly disagree _____5	
3	Health care provider treats me in a very friendly and courteous manner when I go for immunization	Strongly Agree _____1 Agree_____2	

		Neutral _____3 Disagree _____4 Strongly disagree _____5	
5	Do you perceive the health care provider gives adequate service of immunization	Strongly Agree _____1 Agree_____2 Neutral _____3 Disagree _____4 Strongly disagree _____5	
4	Immunization keeps my child from disease**?**	Strongly Agree _____1 Agree_____2 Neutral _____3 Disagree _____4 Strongly disagree _____5	
6	I am totally satisfied with the immunization services being provided at health institutions found in my area.	Strongly Agree _____1 Agree_____2 Neutral _____3 Disagree _____4 Strongly disagree _____5	
	3.3. Knowledge Questions		
1	Do you know any newly added vaccines (Hep-B, Hi-B and PCV)?	Yes_____1 No _____2	
2	Do you know what measles vaccine is?	Yes_____1 No _____2	
3	Do you know what BCG vaccine is?	Yes_____1 No _____2	
4	Do you know the schedule of vaccines?	Yes_____1 No _____2	
5	When does a baby need to receive the dose of BCG vaccine?	Immediately at birth_____1 At 1 week_____2 At 2 - 4 weeks_____3 Older than 4 weeks_____4 Don't know_____5	
6	Do you know the schedule of Polio Vaccine?	Yes_____1 No _____2	
7	When does a baby need to receive the first dose of polio vaccine?	Immediately at birth_____1 At 1 week_____2 At 2 - 4 weeks_____3 Older than 4 weeks_____4 Don't know_____5	
8	Do you know the benefit of vaccines?	Yes_____1 No _____2	
9	Do you know the need to return for 2nd and 3rd dose (importance of subsequent dose?)	Yes_____1 No _____2	
10	Do you know the side reactions of immunizations?	Yes_____1 No _____2	

መረጃ/ዳታ መሰብሰቢያ መጠይቅ

ከመሰብሰቡ በፊት መጠይቁ በሚሞላው ጠያቂ ለተጠያቂ የሚነበብ

ጤና ስጥልኝ! እንደምን አደራችሁ/እንደምን ዋላችሁ! ስሜ _____እባላለሁ.የመጣሁት ከአሶሳ ወረዳ ነው:: የመጣሁበት ዋና ዓለማ የጅማ ዩንቨርሲቲ ተማሪ ለድህረ-ምረቃ መመረቂያ የሚያጠናውን ለክትባት ማቋረጥ ምክኒያት የሚሆኑትን ጉዳዮች ምንምን እንደሆኑ ለመለየት እንዲቻል የተወሰኑ ጥያቄዎችን ለመጠየቅ ነው፡፡ ክትብት ለህጻናት ከተለያዩ በሽታዎች የሚከላከል ሲሆን ህጣናት ይህን ዕድል ባያገኙ ለተለያዩ ተላላፊ በሽታዎች በመጋለጥ ለህመምን ሞት ይዳረጋሉ፡፡ ስለሆነም የክትባት አገልግሎት ምን እንደሚመስልና ያልተከተቡት ህጻናት በምን ምክንያት እንደሆነ ለማወቅ ከእርስዎ የሚፈለገው የዚህ ጥናት አንድ አካል ሆኖው በነጻነት ለዚህ ተግባር ለመተባበር ምንም ሳይገደዱ የበኩልዎን ኃላፍነት እና ድጋፍ እንዲያደርጉ ነው፡፡ ለማወቅ ወይም ግልጽ እንዲሆንሎት የሚፈለጉትን ማንኛውን ቃል/ጥያቄ ካሎዎት በሚፈልጉት ጊዜና ሁኔታ መጠየቅ ይችላሉ፡፡

እንግዲህ በዚህ ጥናት ለመሳተፍ ከተስማሙ ለክትባት መቋረጥ ምክኒያት የሚሆኑ ጉዳዮች ላይ የእርስዎ ልምድና አስተሳሰብ ምን እንደሚመስል ከ15 ደቂቃ ባልበለጠ ሰዓት የሚመልሱትን ጥያቄዎችን እንጠይቆዎታለን፡፡ መጠይቁም ከ12-23 ወር ዕድሜ ልጅ ላላቸው እናቶች ብቻ የሚጠየቅ ነው፡፡ ደስ ከላሎት እባክዎ በማንኛውም ጊዜ የሚጠየቁትን ጥያቄ መተውም መመለስም የእርስዎ ፍላጎት ብቻ መሰረት ያደረገ መሆኑን ሊረዱ ይገባል፡፡ በዚህ በመሳተፍዎ ከዚህ ጥናት በቀጥታ የሚያገኙት ጥቅም የለም፡፡ ነገር ግን ከእርስዎ የሚገኘውን መረጃ በመጠቀም በህጻናት ክትባት ላይ ያሉትን ችግሮችን በመለየት የህጻናትን የክትባት አገልግሎት ለማሻሻልና ለመሳደግ ከፍተኛ ጠቀሜታ አለው፡፡

በዚህ ጥናት በመሳተፍዎም ምንም የሚከፍሉት ነገር የለም፡፡ በመሳተፍዎም እጅግ በጣም እናመሰግናለን፡፡በዚህ ጥናት አልሳተፍም የሚል ውሳኔ ከወሰኑም ውሳኔዎ በእርስዎ የሚፈጥረው ምንም ነገር የለም፡፡ የሚሰጡትን መረጃ ጥናቱ ከሚያጠናው አካል ውጭ ለሌላ ዓላማ በምንም ሁኔታ አይውልም፣ መረጃውም በመረጃ ማስቀመጫ ቦታ አጥኒው አካል ያስቀምጣል፡፡ በማንኛውም ሰዓት ጥያቄውም ማቋረጥ ይችላሉ፡፡ ይህ በማድረግዎም በእርስዎ ላይ ምንም የሚፈጠር የለም፡፡

ማንኛውም ጥያቄ ካሎዎት እዚህ እስካለን መጠየቅ ይችላሉ፡፡ ይህን ጥናት የጅማ ዩንቨርሲቲ ከፍተኛ ልምድ ባላቸው የድህረ-ምረቃ አስተማሪዎች በአቶ ፋሲል ተሰማ እና በአቶ ደስታ ሂቆ የሚታገዝ ሲሆን በጅማ ዩንቨርሲቲ የጥናትና ምርምር ቦርድ ተገምግሞ የሚጸድቅ ይሆናል፡፡

የበጎ ፍቃደኝነት ስምምነት - እኔ ተሳታፊው በዚህ ጥናት ለመሳተፍ የሚኖሩትን የጥናቱ ተፈጥራዊ ሁኔታ፣ ዓላማ፣ ጠቀሜታና ተጽዕኖዎችን ምን እንደሚመስል ተገልጾልኛል፡፡በዚህ መሰረት በጥናቱ ለመሳተፍ የወሰንኩ መሆኔን በፊርማዬ አረጋግጣለሁ ስም---------- ፊርማ ---------ቢገለጽልኝም በጥናቱ ለመሳተፍ ያልወሰንኩ መሆኔን በፊርማዬ አረጋግጣለሁ ስም ----------ፊርማ----------::

_____ _____ _____

የጠያቂው ስም ፊርማ ቀን

በአማርኛ የተዘጋጀ መጠይቅ

II. የመጠይቅ መለያ

የመጠይቁ መለያ/ ኮድ ----------

የተጠየቀበት ቀን: _____/_____/_____

ክልል:_____ዞን:_____ወረዳ_____ቀበሌ:_____

የቤት ቁጥር :- _____

የሱፐርቫይዘሩ ስምና ፊርማ :-

_____

መጠይቁ በትክክል መሞላቱ የተረጋገጠበት ቀን _____/_____/_____

I. ማህበራዊና ዲሞግራፊያዊ መረጃ

ተ/ቁ	ጥያቄ	ኮድ(ትክክለኛው በማክበብ ይምረጡ)
13.	የሚኖርበት ከተማ ወይስ ገጠር?	ከተማ ____1 ገጠር ____2
14.	በቤት ውሥጥ የቤተ-ሰብ ብዛት	ወንድ _____ ሴት_____
15.	ሀይማኖትዎ ምንድን ነው?	ኦርቶዶክስ ____1 ሙስሊም ____.2 ፕሮቴስታንት ____3 ካቶሊክ ____4 ሌላ ካለ ይገለጽ____.5
16.	ብሔረሰብዎ ምንድን ነው?	በርታ ____1 ጉሙዝ ____2 ሸናሻ ____3 አማራ____4 ኦሮሞ____5 ትግሬ ____6 ሌላ ካለ ይገለጽ____7
17.	በአሁኑ ጊዜ የጋብቻዎ ሁኔታ ምን ይመስላል?	ያገባ____1 ያላገባ____2 የፈታ ____3 ፈትቶ ያገባ____4 ተለያይቶ መኖር____.5
18.	ጾታዎ ምንድን ነው?	ወንድ____1 ሴት ____.2
19.	ተጠያቂው ከህጻኑ ጋር ያለው/ላት ግንኙነት?	እናት____1 እህት____2 አባት____3 አያት____4

		ሌላ ካለ ይገለ____5 ተጠያቂ	
		እናት	አባት/ሌላ አሳዳጊ (ይገለጽ------)
20.	የተጠያቂው ዕደሜ ስንት ነው?		
21.	የተጠያቂው የትምህርት ደረጃ ምን ይመስላል?	• መጻፍና ማንበብ አይችልም/አትችልም_1 • ባይማርም/ባትማርም መጻፍና ማምበብ ይችላል/ትችላለች____2 • አንደኛ ደረጃ ትም/ት ቤት (ከ1-8 ክፍል)____3 • ሁለተኛ ደረጃ ትም/ት ቤት(ከ9-12 ክፍል)____4 • ከ12ኛ ክፍል በላይ ____5	• መጻፍና ማንበብ አይችልም/አትችልም____1 • ባይማርም/ባትማርም መጻፍና ማምበብ ይችላል/ትችላለች____2 • አንደኛ ደረጃ ትም/ት ቤት (ከ1-8 ክፍል)____3 • ሁለተኛ ደረጃ ትም/ት ቤት(ከ9-12 ክፍል)____4 • ከ12ኛ ክፍል በላይ ____5
22.	የተጠያቂ የስራ መስክ ምንድን ነው?	ገበሬ____1 ነጋዴ ____2 መንግስት ሰራተኛ____3 የግል ተቋም ____4 የቤት እመቤት____5	ገበሬ____1 ነጋዴ ____2 መንግስት ሰራተኛ____3 የግል ተቋም ____4 ሌላ ካለ ይገለጽ____5
23.	በአካባቢዎ በቅርበት የሚገኘው የጤና ተቋም ዓይነት ምንድን ነው?	ሆስፒታል____1 ጤና ጣቢያ ____2 ጤና ኬላ ____3 ሌላ ካለ ይገለጽ ____.4	
24.	የወር ገቢዎ በገንዘብ ስንት ነው?	ገቢ በኢትዮጵያ ብር ____	

II. የክትባት ሁኔታ

መመሪያ፡- ከተ.ቁ 1-9፡-

- በቤት ለቤት ቆጠራ መሰረት ሁለት ወይም ሶስት በቤት ውስጥ ህጻናት ካሉ ከትንሹ ህጻን በመጀመር ሁሉንም በአንድ ቤት የሚኖሩትን በመመዝገብ ስለ መጀመሪያው ህጻን ጥያቄውን ይምሉ (ቢያነስ በቤት ውስጥ 12 ወር ዕድሜ ላለው ህጻን መሆን አለበት) የመጀመሪያው ህጻን ጥያቄ ከጨረሱ ወደ ሁለተኛውና ሶስተኛው በተከታታይ ተመሳሳይ ጥያቄ ይጠይቁ ።

ለተ.ቁ 3 ፡-

1) ከክትባት ካርድ የሁሉም ክትባት ዓይነቶችን ቀናት ይመዝግቡ
2) ክትባት ተሰጥቶ በክትባት ካርድ ቀኑ ካልተጻፈ 44 ይመዝግቡ

ተ/ቁ	ጥያቄ	ኮድ(ትክክለኛው በማክበብ ይምረጡ)		ወደ ቀጣይ ጥያቄ ይሂዱ…
		ትንሹ በቤት ውስጥ ያለ ህጻን (ቢያንስ 12 ወር)	ቀጥሎ ያለውን ሁለተኛ ህጻን (ከመጀመሪያው ቀጥሎ ያለው ህጻን በዕድሜ)	ቀጥሎ ያለውን ሶስተኛህጻን (ከሁለተኛው ህጻን ቀጥሎ ያለውን የ23 ወርና ከ23 ወር ዕድሜ በታች)
1	ጸታ?	ወንድ____1 ሴት____2	ወንድ____1 ሴት____2	ወንድ____1 ሴት____2
2	የሁሉንም ህፃናት የክትባት ካርድ ይኖራል? መልስዎ አዎ ከሆነ ማየት ይቻላል?	አዎ, ታይቷል____1 አዎ, አልታየም____2 የክትባት ካርድ የለም___3	አዎ, ታይቷል____1 አዎ, አልታየም____2 የክትባት ካርድ የለም___3	አዎ, ታይቷል____1 አዎ, አልታየም____2 የክትባት ካርድ የለም___3

3		M	M	D	D	Y	Y	Y	Y		M	M	D	D	Y	Y	Y	Y		M	M	D	D	Y	Y	Y	Y
	ቢ.ሲ.ጂ																										
	ፖ/ሊዮ-0																										
	ፖ/ሊዮ-1																										
	ፖ/ሊዮ-2																										
	ፖ/ሊዮ-3																										

	ፔንታቫለንት-1			
	ፔንታቫለንት-2			
	ፔንታቫለንት-3			
	ኩፍኝ			
4	የሳንባ ነቀርሳ መከላከያ ክትባት በቀኝ ክንድ የሚሰጠው ወስዷል?	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3
5	በአፍ በጠብታ የሚሰጠው የልጅነት ልምሻ መከላከያ ክትባት?	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3
6	በአፍ የሚሰጠው የልጅነት ልምሻ መከላከያ ክትባትስንት ጊዜ ወስዷል?			
7	በመርፌ በታፋ የሚሰጠው ጸረ-አምስት ክትባት ወስዷል?	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3
8	ጸረ-አምስት ክትባት ስንት ጊዜ ወስዷል?			
9	የክፉኝ በሽታ ለመከላከል በመርፌ የሚሰጠው ክትባት ወስዷል?	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3	አዎ____1 የለም____2 አላውቀውም/አላስታውስም____3

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III. ለክትባት መቋረጥ ዋና ዋና ምክኒያቶች ለመለየት የተዘጋጀ መጠይቅ

ተ/ቁ	ጥያቄ	ኮድ(ትክክለኛው በማክበብ ይምረጡ)	ወደ ቀጣይ ጥያቄ ይሂዱ…
3.1 ለክትባት መቋረጥ ምክኒያት የሚሆኑ ከእናቶችና ህጻናት ጤና አገልግሎት ጋር የሚያያዙ ጉዳዮች መጠይቅ			
1	የክትባት ፕሮግራም እንዲራዘም አድርጎ ያውቃሉ?	አዎ____1 የለም____2	
2	ቅድመ ወሊድ አግልግሎት ተከታትሎ ያውቃሉ?	አዎ____1 የለም____2	
3	በአሆኑ ግዜ ድህረ ወሊድ ክትትል ያደርጋሉ?	አዎ____1 የለም____2	
4	የክትባት መረጃ በተመለከተ ምንጩ ምንድነው?	የክትባት ካርድ ____1 የእናት/አሳዳጊ ታሪክ _2	
5	የክትባት መስጫ ቦታ በጣም ሩቅ ነው?	አዎ____1 የለም____2	
6	ክትባት የሚሰጥበት ጊዜ አመቺ አይደለም?	አዎ____1 የለም____2	
7	በክትባት መስጫ ተቋማት ሁሉ ጊዜ በቂ የክትባት መድሀኒት አቅርቦት አለ?	አዎ____1 የለም____2	
8	ህጻኑ ለሌላ አገልግሎት ወይም ከእናት ጋር ወደ ጤና ተቃም ወይም ወደ ወሎ ገባ ጣቢያ ሲመጣ የክትባት አገልግሎት ማግኘት ሲችልያላገኘበት ወቅት አለ?	አዎ____1 የለም____2	
9	አገልግሎት ሰጪ ባለሞያው የክትባት ጠቀሜታ ምን እንደሆነ ይነግሮዎታል?	አዎ____1 የለም____2	
3.2. የአስተሳሰብ ጥያቄዎች			
1	ጤና ተቋማት ክትባትን ይደግፋሉ ብሎ ይስማማሉ?	በጣም እስማማለሁ ____1 እስማማሉ _____2 ምንም አላውቅም_____3 መካከለኛ_____4 በጣም አልስማማም____5	
2	ለክትባት ማነቆ የሆኑትን ጉዳዮች መኖራቸውን ይስማማሉ?	በጣም እስማማለሁ ____1 እስማማሉ ____2 መካከለኛ____3 አልስማማም____4 በጣም አልስማማም____5	
3	የጤና ባለሞያዎች የሚሰጡትን አገልግሎት በቂና ጥሩ ነው ብሎ ይስማማሉ?	በጣም እስማማለሁ ____1 እስማማሉ ____2 መካከለኛ____3 አልስማማም____4 በጣም አልስማማም____5	
4	ለክትባት ወደ ክትባት መስጫ ቦታ ስሄዱ አገልግሎት ሰጪ ባለሞያዎች እርስዎን በማጽናናትና እንደ ጓደኛ	በጣም እስማማለሁ ____1 እስማማሉ ____2	

	በማቅረብ ይመክሩዎታል ያስተናግዶዎታል?	ምንም አላውቅም____3 መካከለኛ____4 በጣም አልስማማም____5	
5	ክትባት ለልጅዬ ከተላላፊ በሽታዎች እንዲጠበቅ ያስችሏል ብሎ ይስማማሉ?	በጣም እስማማለሁ ____1 እስማማሉ ____2 መካከለኛ____3 አልስማማም____4 በጣም አልስማማም____5	
6	በአካባቢዎ ባሉት የጤና ተቋማት በሚሰጠው የክትባት አገልግሎት በአጠቃላይ ረኪቻለሁ ብሎ ይስማማሉ?	በጣም እስማማለሁ ____1 እስማማሉ ____2 መካከለኛ____3 አልስማማም____4 በጣም አልስማማም____5	
3.2.	**የዕውቀት ጥያቄዎች**		
1	አዲስ በቅርብ ጊዜ የተጨመሩ የክትባት ዓይኖቶች እንዳሉ ያውቃሉ (የሳምባ ምቺ፣ ሄፓታይትስ ቢ ዓይነት…)?	አዎ____1 የለም____2	
2	የኩፍኝ ክትባት ምን እንደሆነ ያውቃሉ?	አዎ____1 የለም____2	
3	የቢ.ሲ.ጂ ክትባት ምን እንደሆነ ያውቃሉ?	አዎ____1 የለም____2	
4	ክትባት የሚሰጡባቸው ክፍለ ግዘያት ያውቃሉ?”	አዎ____1 የለም____2	
5	የሳንባ በሽታ መከላከያ ከትባት ልጅዎ የወሰደው መች ነበር?	እንደተወለደ ወድያውኑ____1 እንደ ተወለደ በአንድ ሳምንት__2 ከ2 - 4 ሳምንታት____.3 ከ4 ሳምንታት በላይ____4 አላውቀውም ____5	
6	የልጅነት ልምሻ መከላከያ ከትባት የሚሰጥበት ክፍለ ግዜ ያውቁታል?	አዎ____1 የለም____2	
7	በአፍ የሚሰጠው የልጅነት ልምሻ መከላከያ ከትባት ጠብታ ልጅዎ የወሰደው መች ነበር?	እንደተወለደ ወድያውኑ____1 እንደ ተወለደ በአንድ ሳምንት__2 ከ2 - 4 ሳምንታት____.3 ከ4 ሳምንታት በላይ____4 አላውቀውም ____5	
8	የክትባት ጥቅም ምን እንደሆነ ያውቁታል?	አዎ____1 የለም____2	
9	በ2ኛና በ3ኛ ጊዜ የክትባት ክፍለ ግዜ መመለስ ጥቅም እንዳለው ያውቃሉ?	አዎ____1 የለም____2	
10	በክትባት ግዜ የሚከሰት የጎኒዮሽ ጉዳት መኖሩን ያውቃሉ?	አዎ____1 የለም____2	