ASSESMENT OF THE MAGNITUDE OF VALID DOSE OF CHILD VACCINATION & ITS ASSOCIATED FACTORS AMONG CHILDREN AGED 12 – 23 MONTHS in DUGUNA FANGO WOREDA, WOLAYTA ZONE, SOUTHERN NATION & NATIONALITY PEOPLE REGION, FEBRUARY 10 – 29, 2016

PREPARED BY: -

HAIMANOT FESEHA (BSC)

A RESEARCH THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH (MPH).

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Board of Examiner's (BoE) Approval Sheet

As members of the examining board of the final MPH open defense, we certify that we have read and evaluated the thesis prepared by Haimanot Feseha entitled," Assessment of the magnitude of valid dose of child vaccination & its associated factor among children aged 12 – 23 months in Duguna Fango woreda, wolayta zone, Southern nation & nationality people region, February 10 – 29, 2016" and recommend that it is accepted as fulfilling the thesis required for the degree of **Master of Public Health.**

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Name of Internal Examiner	Signature	Date
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Name of External Examiner	Signature	Date

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ABSTRACT

Background: *Studies have demonstrated that high vaccination coverage rates do not necessarily imply valid dose vaccinations. The timely start of vaccination is important in light of the rapid waning of trans-placental immunity in the first year of life against vaccine-preventable diseases. Delayed doses in turn put individuals at risk of disease due to waning immunity over time and put the whole community at risk of epidemic. The valid dose of vaccination for children is important to build baby's immunity at an early age in order to reduce his/her risk of serious disease or death. Thus, it is important to take the valid dose of vaccination into account.*

Objective: *Assessment of the magnitude of valid dose of child vaccination & its associated factor among children aged 12 – 23 months in Duguna Fango woreda, wolayta zone, Southern nation & nationality people region, Ethiopia, February 10 – 29, 2016.*

Methodology: *Community based cross sectional study was conducted in Duguna fango woreda, Wolaita zone from February 10 - 29, 2016 G.C. A total of 491 children of aged between 12-23 months with vaccination card & registered in health faccility vaccination registration book is included in this study. World health organization cluster sampling techniques was used to identify study units. Data were obtain from vaccination cards & registration book from vaccinated health facility. Information on maternal socio-demographic characteristics and household variables were collected using an interviewer-administered structured questionnaire. Data were entered and analyzed using SPSS version 20. Bivariate analysis was done to test the association between independent and dependent variables. Variables with P<0.2 in the bivariate analysis were included in multivariate logistic regression to determine the valid dose of childhood vaccination.*

Result: *From total of 491 children included in the study only 32.2% (95%CI: 28.1, 36.0) are found to have valid dose vaccination. Mother's educational status with AOR of 1.86 (0.86, 4.0), Income 3.62 (0.98, 3.39), caregiver's age 3.22 (0.17, 60.2), knowledge on session's time specifically on the second session time AOR=5.2 (95% CI: 1.26, 29.4), quality and accessibility to health facility 15.12 (1.54, 148.05) & Proper appointment given with AOR of 41.63 (4.45, 388.73) were the main factors associated with having a valid dose vaccination of children aged b/n 12 – 23 month.*

Conclusion*: There is low magnitude of valid dose vaccination among children aged 12-23 months in Duguna Fango woreda. Hence Wolaita zone health department, Duguna fango woreda health office & the health facilities under these woreda should work strong and intensive awareness creation activities on these mentioned contributing major factors above to improve a valid dose vaccination of children in their area and acquire quality vaccination service to the community.*

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ACRONYMS

BCG ……Bacillus Calmette- Guirin

CI ……Confidnce Interval

DPT…….……Diphtheria, Pertussis and Tetanus

DHS……..…….....Demographic and Health Survey

EPI ...……...……Expanded Program on Immunization

HepB……. Hepatitis B

Hib…..……Hemophilus influenza type B

HEW……..…….Health extension worker

HF…….……..Health facility

HH……...…House hold

HP……..Health Post

HMIS……Health management information system

HC……Health center

MDG ……..Millennium Development Goal

NGO……Non-governmental organization

OPV ……...…….Oral Polio Vaccine

OR ……..……...……..Odds Ratio

PCV…….…….pneumococcal Vaccine

PHCU…….primary health care unit

ROTA……...…,,,…Rotarix vaccine

SNNPR……..Southern nation ,nationalities and people's region

TT…….…….. Tetanus Toxoid

WHO……...…….. World Health Organization

Contents

1. INTRODUCTION

1.1 Background

The Expanded Program for Immunization (EPI) in Ethiopia, launched in 1980, has shown steady progress in increasing coverage for all antigens. (1, 8) Performance report in 2010/11 showed wide variation as reported through HMIS compared to DHS and other assessments. Administrative coverage (through HMIS) was reported as at 87% for DPT-HepB-Hib3 in 2010, the Demographic and Health Survey (DHS) estimating DPT-HepB-Hib3 (CSA, 2011) to be 36.5% for 2010. (2)

In order for meaningful and ongoing program decision-making,Achieving high vaccination coverage is a necessary, but an insufficient indicator of the quality of vaccination programs geared towards preventing childhood infectious diseases. Valid dose vaccination is increasingly recognized as another important target for optimal protection of children and has received close attention in many countries in recent years.(3) The standard measure of vaccination coverage and also compliance with recommended vaccinations is usually estimated based on the percentage of children in a specific age group who have received the recommended number of vaccine doses without regard to the timing of vaccination. Aspects of timelyvaccine administration are (a) premature vaccinations, i.e. vaccinations administered earlier than recommended and (b) vaccinations administered with inappropriately short intervals between vaccine doses. Both may result in a suboptimal vaccine response. The World Health Organization (WHO) classified those vaccinations as invalid. (4)Studies have demonstrated that high vaccination coverage rates do not necessarily imply valid dose vaccinations. The timing and spacing of vaccine doses are two of the most important issues in the appropriate use of vaccines. (5)

Vaccinations are recommended for members of the youngest age group at risk for a disease for whom efficacy and safety of a vaccine have been demonstrated. Most vaccines in the childhood Vaccination schedule require two or more doses for development of an adequate and persisting antibody response. Studies have demonstrated that recommended ages and intervals between doses of the same antigen(s) provide optimal protection or have the best evidence of efficacy. (5)

The valid dose of vaccine is designed to build baby's immunity at an early age in order to reduce his/her risk of serious disease or death. Every day babies are exposed to germs from the air they breathe, to the things they touch and put in their mouths. If exposed to a disease, a baby's immune system might not be strong enough to fight it off without the help of a vaccination. The timely start of vaccination is important in light of the rapid waning of trans-placental immunity in the first year of life against vaccine-preventable diseases. Delayed doses in turn put individuals at risk of disease due to waning immunity over time and put the whole community at risk of epidemic. Thus, it is important to take the correct timing of vaccination into account. (5)

Vaccine doses administered up to 4 days before the minimum interval or age can be counted as valid dose vaccination. Doses administered 5 days or earlier than the minimum interval or age should not be counted as valid doses and should be repeated as age appropriate. The repeat dose should generally be spaced after the invalid dose by an interval at least equal to the recommended minimum interval (5) as shown below in annex I.

One of the most common breaches of the Vaccination schedule occurs when people miss an appointment, resulting in a longer than recommended interval between doses of a vaccine. Delays generally do not result in a reduction in final antibody concentrations for most multi-dose products. However, maximum protection may not be attained until the complete vaccine series has been administered. (6)

1.2 Statement of the Problem

Nationally approximately 29% of deaths in children under five are vaccine preventable (7). In 2011 alone, 1.5 million children died from diseases preventable by currently recommended vaccines (8). It has been also recognized that vaccine preventable diseases are responsible for 16% of under-five mortality in Ethiopia (9).

Ethiopian EPI cluster survey conducted on 2006 showed Overall national coverage of valid dose by antigen is BCG- 58.2%; DPT-HepB-Hib1- 53.8%; DPT-HepBHib3- 41.1%; OPV3 39.5%; and measles 27.2%. Of these the SNNPR valid dose by antigen showed BCG- 72.0%, DPT-HepB-Hib1- 64.9% , DPT-HepBHib3 - 52.7%, OPV3- 51% , measles- 35.4% (10)

Ethiopian EPI cluster survey conducted on 2012 showed Overall coverage of valid dose by antigen is BCG- 67.1%; DPT-HepB-Hib1- 43.6%; OPV1- 43.2%; DPT-HepBHib3- 38.8%; OPV3 37.2%; and measles 23.8%. Of these the SNNPR valid dose by antigen showed BCG- 77.5%, DPT-HepB-Hib1- 39.2 , OPV1- 37.2, DPT-HepBHib3 - 40.4, OPV3- 37 , measles- 20.3 (1)

Therefore from the above data's, surveys on coverage have been conducted and validity dose of national and regional were looked but both revealed that the achieved percentage of valid vaccination from card shows less than that of the total coverage of the areas during the survey in both years & factors for lessen the valid dose vaccination coverage was not deeply seen and not briefed.

Woredas administrative performance shows, vaccination coverage/achievement of all antigen shows above 90% for last 5 consecutive years but there exist no evidence regarding valid dose of vaccinating children except the conducted national surveys, in 2006 & 2012, which include the area (Wolayita zone, D/fango woreda) during coverage study in 2012 but results were categorized regionally and the nationally as stated above.

Hence the aim of this study is to fill gaps seen in magnitude of valid dose vaccination & its associated factors that are not addressed by other similar researches mainly related with valid dose vaccination. The study will assess valid dose of child vaccination and its associated factors among children between 12-23 months of age in D/fango woreda of Wolayita zone, SNNPR.

1.3 Rationale of the study

Studies have demonstrated that high vaccination coverage rates do not necessarily imply valid dose vaccinations (1, 5, 10-11). According to Clark et al. timing of childhood vaccinations varies widely among and within countries, and published yearly estimates of national coverage do not capture these variations (11). Incorrectly timed (early) vaccination doses might in fact explain the persistence or even the resurgence of vaccine-preventable infections, which is especially relevant for countries where high levels of vaccination coverage at milestone ages have been achieved (4, 11). Outbreaks of diseases such as measles can occur in a population with high vaccination coverage (2). This has been attributed to vaccine failure resulting from individuals being vaccinated outside the recommended period

The information obtained from this study is expected to fill gaps seen in availability of study done on valid dose of child vaccination & its associate factors in study area which may vary among communities and the information may also contribute to the existing body of knowledge. The result from the study will also be helpful in preparation of Vaccination policy documents, guidelines and manuals. The study will also be expected to shed light regarding knowledge on usage of resources by coming up with relevant, evidence-based recommendations for addressing issues related with associate factors of valid dose of child vaccination. Findings from this study can guide program managers to increase focus on valid dose of vaccination of children, reduce the incidence of vaccine preventable diseases in Ethiopia and probably other developing countries with similar challenges & also benefice the mothers who have a child which going to vaccinate their children. It will also help other researchers as a base line data for their work.

2. LITRATURE REVIEW

2.1 Vaccination validity coverage in Ethiopia

The national EPI schedule targets children under 1Year providing BCG, OPV, DPT-HepB-Hib (a switch from DPT in March 2007), measles, and pneumococcal vaccine. Vaccines are immunogenic when administered at correct intervals, when the administered during this time frame, the dose is considered 'valid'. Further, to reduce morbidity and mortality of childhood illness, the vaccines should be administered timely, before 12 months of age. (1)

In Ethiopia, the vaccination policy calls for BCG vaccine given at birth, three doses of DPT-HepB-Hib and PCV vaccine given at 6,10and 14 weeks of age, four doses of oral polio vaccine given approximately at 0, 6, 10, and 14 weeks of age, two doses of Rota vaccine given at 6 and 10 weeks and measles vaccine given at 9 months of age as shown in table 1. Vaccination service delivery strategies include fixed (static), outreach, and mobile sites at government and private health facilities (2)

A study conducted as EPI national coverage survey in 2006, overall coverage of valid dose by antigen was BCG 58.2 %; DPT-HepB-Hib1 53.8 %; DPT-HepBHib3 41.1%; OPV3 39.5%; and measles 27.2%& F/Vac.19.9%. Of this the SNNPR coverage of valid dose by antigen was BCG 72.0 %; DPT-HepB-Hib1 64.9 %; DPT-HepBHib3 52.7 %; OPV3 51.3 %; and measles 35.4 %& a F/Vac.of 26.7% (10)

A study conducted nationally as national coverage survey in 2012, overall coverage of valid dose by antigen is BCG 67.1%; DPT-HepB-Hib143.6%; OPV1 43.2%; DPT-HepBHib3 38.8%; OPV3 37.2%; and measles 23.8%. Of this the SNNPR coverage of valid dose by antigen is BCG 77.5%; DPT-HepB-Hib1 39.2%; OPV1 37.2%; DPT-HepBHib3 40.4%; OPV3 37%; and measles 20.3% as labeled bold in below table 1.

Table 1: Percentage of children age 12-23 months who received specific vaccines in the appropriate time range by 12 months of age by region

Region	BCG	DPT-HepB-Hib			Polio				Measles	All vaccine	No vaccine
		1	2	3	0	1	2	3			
	%	%	%	%	%	%	%	%	%	%	%
ADD	94.7	88.5	86.8	84.9	80.1	88.9	87.2	86.1	80.2	66.7	1.8
AFA	37.0	9.3	11.3	7	6.1	7.8	10	8.2	4.4	3	60.3
AMH	69.5	54.6	51.7	44.2	2.7	53.3	49.8	42.2	25.7	19.9	26.3
BEN	66.9	40.7	39.8	35.1	3.7	38.1	37.4	30.8	17.2	11.8	27.9
DIR	90.4	60.7	70.7	67.1	33.6	61.1	69.1	65.3	46.7	38.6	7.1
GAM	59.4	22.5	20.2	14.4	8.6	22.7	19.9	14.8	8.2	5.1	38.2
HAR	82.4	49.7	44.8	37.2	22.3	50.5	47.3	36.1	24.1	20	16.4
ORO	61.6	39.6	37.2	34.2	2.2	40.7	38.6	33.5	23.3	18.4	34.8
SNN	**77.5**	**39.2**	**41.8**	**40.4**	**3.2**	**37.2**	**36.8**	**37**	**20.3**	**14.6**	**19.1**
SOM	28.6	6.4	4.1	3.2	2.2	5.8	4.9	3.1	1.6	0	69.5
TIG	94.3	74.1	76.2	71.3	12.7	73.3	77.5	69.6	42.3	36.3	4.8
ETH	**67.1**	**43.6**	**42.5**	**38.8**	**4.9**	**43.2**	**41.7**	**37.2**	**23.8**	**18.6**	**29.5**

2.2 Maternal socio demographic factor

A study which applied the Kaplan-Meier method to estimate age-specific vaccination coverage with diphtheria, tetanus and pertussis (DTP) vaccine and a measles-containing vaccine (MCV) from the country DHS data and a Cox proportional hazard regression with shared frailty was used to examine factors associated with delayed vaccinations that conducted in two post-Soviet countries, Armenia and Kyrgyzstan on Improved coverage and timing of childhood vaccinations showed that there is an association of childhood place of residence, children place of birth, age & education level of mothers. Hence in Armenia, living in urban areas was associated with delays with both DTP3 0.73 (95% CI: 0.57–0.92) and MCV vaccinations0.83 (95% CI: 0.67–1.03). Additionally, maternal age was associated with correctly timed DTP3 and MCV vaccinations, and children of younger mothers were more likely to have correctly timed vaccinations DPT3 6.14 (95% CI: 1.76–21.42) And MCV 3.42 (95% CI: 0.89–13.17). Regional differences in timely vaccinations were found in both countries. In Armenia, DTP3 and MCV vaccinations were more likely to be delayed in the Armavir and Syunik regions than in the capital city, Yerevan. (12)

An EPI-based two-stage cluster survey conducted in Belgium a title of Infant vaccination coverage in 2005 and predictive factors for valid vaccination, revealed four most important factors related to invalid dose vaccination were maternal age, the paternal age, the employment situation of the mother, and the main vaccinator. The other five variables were the province of residence, the maternal educational level, the paternal educational level, the family income and the age of the child. A visible cut-off could be distinguished after the nine variables described above for most of the models. For the models predicting complete vaccination with DTP, Hib, HBV or MBR, the child's age was not retained. For both MenC models, use of day-care was retained as a tenth factor and for the model predicting valid vaccination, the number of siblings was an eleventh factor. (3, 13)

Other significant characteristics were the employment situation of the mother and the family income. With a full-time working mother, valid vaccination was more likely with IPV, DTP, Hib and HBV and also with the total schedule as a whole, whereas valid MMR vaccination was more likely if the family income was higher than €1500 per month. Looking at the number of doses, a full-time working mother was a significant factor only for complete DTP and Hib vaccination. (13)

A survey conducted in India in which the method used is District Level Household and FacilitySurvey-3 (DLHS-3) 2007-2008 data, they have found that the recommended intervals in between each vaccine were not maintained in West Bengal. The average interval between DPT1 and DPT2 remained 1.6 months while the same in between DPT2 and DPT3 was 1.8 months. While the average interval exceeded the recommended interval in between three dosages of DPT and BCG to Measles vaccine, the same in between DPT3 and Measles vaccine was less than the recommended one. The shortest interval in all these six cases remained zero. (14)

2.3 Knowledge on vaccination

Knowledge about vaccination is attained through various channels including interaction with healthcare centers. Mothers and caretakers who did not know the schedule of vaccines and the benefits of Vaccination were 6 times more likely to have defaulter. However, parents' decision to immunize their child is also affected by perceived efficacy of vaccination. In rural communities, one family's negative experience can affect the decisions of other families in the community. (16) Knowledge of mothers or immediate caretakers about Vaccination affects children Vaccination status. (17)

A community based cross sectional study, Factors associated with complete Vaccination coverage in children aged 12–23 months conducted in Ambo woreda, central Ethiopia, of the total respondents, about 96% heard about vaccination and vaccine preventable diseases. The majority of respondents (79.5%) knew that the objective of vaccinating children was to prevent disease. About 77% of the respondents cited less than three types of vaccine preventable diseases, while 23.3% mentioned four or more types of vaccine preventable disease. With regard to respondent's knowledge about the age at which the child begins and finishes vaccination, 45% of them knew the age at child vaccination begins and 67.5% knew the age at the child finishes Vaccination. In addition to these, only one fourth (25.9%) of the respondents knew the session needed to complete the child Vaccination. The knowledge of the mother was significantly different by the area of residence for the objective of vaccination, knowledge of number of vaccine preventable diseases, sessions needed for complete Vaccination and age at child begins and completes Vaccination. (18)

In previous studies or surveys conducted in our country that are published & non published are more of coverage based so in these studies & surveys, the knowledge of the mothers and care givers are assessed as indicated above so these study will point specifically the knowledge of mothers & care givers in regards of valid dose of child vaccination.

2.4 Access & Overview of vaccination service

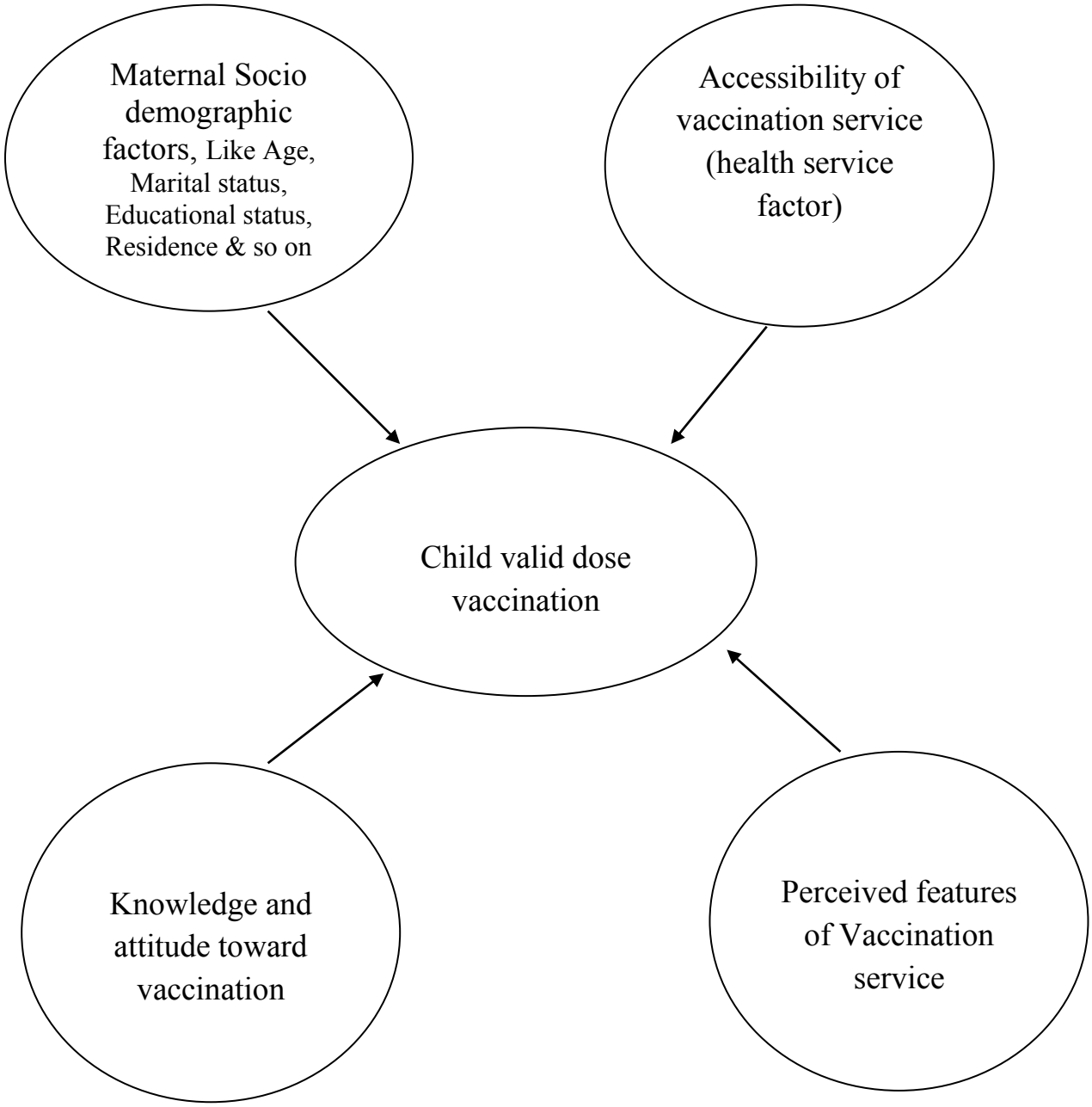
Access and overviews of different vaccination services given at health facilities determine the health seeking behaviors of the community. A survey conducted nationally shows that only 0.5% caretakers respondent claimed vaccination place too far & that do not take their child to vaccination site on distance found under 5Km but while looking of those respondent who are living above 5 KM from the site& claimed the vaccination place is too far for vaccinating their children were accounts for 27.1%. (1)

A national survey conducted in 2006 shows that, Access, as defined in EPI programs by DPT1 coverage, in the survey shows more than 80% nationally. However, in three regions (Somali, Gambella and Afar), access to Vaccination is still a major problem (DPT1 < 50%) and the DPT3 coverage is less than 30%. Availability of Vaccination service and accessibility in terms of distance in kebeles were also factors that positively influence child Vaccination.(10)

Cross-sectional study done in Sudan showed that walking time to the nearest place of vaccination strongly influenced the correct vaccination status of the child. Children of mothers who have better access to vaccine services (less than 30 minutes walking time to the nearest place of vaccination) were 3.4 times more likely to have had the correct vaccinations than were children of mothers who have to walk 30 minutes or longer. (15)

A baseline survey conducted in Gedeo zone by Last 10 kilometer (L10K) in 2015 reported that, Penta1 coverage was used as a proxy indicator to measure access to vaccination services, the overall access to vaccination services was about 88%. The best access to vaccination services was recorded in North Western, East Wolega, Awi, Bench Maji and Yem zones. Access to vaccination was lowest in the Afar and Gedio zones. (19)

Figure I. Conceptual frame work



Source: Ethiopia national survey 2012/13, researches conducted in Immunization incompletion in AAU & majorly the Principal Investigator (PI) made it in the way for this thesis study.

3 Objective

3.1 General objective

- To assess the prevalence of valid dose of child vaccination and associated factors among children aged 12-23 months in Duguna Fango woreda,Wolayita zone at SNNPR starting from February 10 - 29, 2016 G.C

3.2 Specific objectives

A) To determine the prevalence of valid dose among children aged 12-23 months.

B) To assess factors associated with valid dose of child vaccination among children aged 12-23 months.

4 METHODS & MATERIALS

4.1. Study area

The study was conducted at D/fango woreda which is located in the southern area of 340 Km away from Addis Ababa & 38 Km away from wolayita zone (Sodo town). D/fango is one of the 12 woreda present within the zone and the woreda has, based on 2007 CSA population projection estimation, 119,438 total population, 4133 under one children & 3810 surviving infant do presents for 2008 EFY. There is 32 kebeles, 1 district hospital, 6 HC, 26 Rural & 6 urban HP that provide the health service.

4.2. Study period

The data collection for this study was conducted from February 10 - 29, 2016 G.C.

4.3. Study design

Community-based cross-sectional study design was conducted.

4.4. Study Population

4.4.1. Source population

All Mothers/caretakers with children aged between 12-23 months who have Vaccination card & registered in HFs registration book in D/fango woreda, wolayita zone, SNNPR, with in February 10 - 29, 2016 G.C.

4.4.2. Study population

Mothers/caretakers with children aged between 12-23 months (as per the reported dates of birth) who have vaccination card & registered in HFs registration book, within eligible household in selected cluster with in February 10 - 29, 2016 G.C.

4.4.3. Sample size determination

Since the prevalence of valid dose is retrieved from the studies conducted nationally as a coverage surveys & hence taken specifically from the SNNPR full valid dose coverage percentage placed in national survey in 2013 which is considered as 14.5%. An assumption also made to be with 4% marginal error and 95% confidence interval of certainty (alpha=0.05), with a contingency non response rate of 10% & a design effect of 1.5. Based on these assumptions the actual sample size of the study population is computed using single population proportion as the formula depicted below.

$$n = \frac{(Z\ \alpha/2)^2 P\ (1-P)}{d^2} * DE$$

Where:

n = Sample size

$(Z\ \alpha/2)^2 = 1.96$ critical value (confident limit)

P = valid dose of child vaccination for all antigen is considered 14.5% of SNNPR from national survey conducted in 2013

d = 4% precision (marginal error)

DE = 1.5

$$\text{Thus } n = \frac{(1.96)^2(0.145)\ (1-0.145)}{(0.04)^2} * 1.5$$

Total sample size = 446

Non response rate = 10 % x 446 = 45

Total sample size= **491**

Sample size was calculated for remaining objectives such as socio demographic factors associated with valid dose coverage using double population proportion. The sample size for the first objective was the biggest one, so a sample size of **491** was taken as a final sample size for this study. Here below table 2 show the calculated sample size using a double proportion of the second objective.

Table 2: Assumptions and calculated sample sizes for study objectives.

Factor considered	Formula used	p_1	p_2	Sample size
	$n_{1=} \frac{[Z\alpha/_2\sqrt{2pq} + Z_{1-\beta}\sqrt{p_1q_1+p_2q_2}]^2}{(P_1-p_2)^2}$			
educational level	$p_{1=}$ proportion of care takers that didn't vaccinate validly among illiterates $p_{2=}$proportion of care takers that didn't vaccinate validly among secondary and above $\frac{z\alpha}{2}$ =critical value at 96% level of significance α is type I error with a value of 4% $z1-\beta$ = standard normal distribution value corresponding to 80% power to detect the assumed difference =0.84.	36.5 %	5.2%	64
Income	$p_{1=}$ proportion of care takers that has lowest average monthly income $p_{2=}$ proportion of care takers that has highest average monthly income	36.6 %	20.3 %	58
Knowledge on immunization	$p_{1=}$ proportion of care takers that don't know the correct session needed $p_{2=}$ proportion of care takers that know the correct session needed	50.2 %	14.2 %	19
Access to immunization service	$p_{1=}$ proportion of children of households of access to health facility that provide immunization service or live in <5KM p2= proportion of children of households of that has poor access to health facility that provide immunization service or live >5KM	81.4 %	14.0 %	5

Most of the proportions that are used in sample size calculation are taken from Ethiopian national survey conducted in 2012 by FMOH (1) and other studies conducted before. (18, 19)

4.4.4. Sampling procedure

In the woreda there are 26 rural kebeles and 6 urban kebels. A multi-stage stratified sampling technique is applied for the selection of the kebeles. For the purpose of logistic feasibility and improving representativeness 12 kebeles, 2 kebeles from urban and 10 from rural kebeles, was

randomly selected. Modified 2005 WHO EPI cluster sampling method that provides guidance for identifying a starting household and subsequent households was used. (22) The households from each kebeles is selected According to WHO EPI cluster sampling method & the first household was selected by locating approximate geographic center in each kebele and one direction from the center was choose using random number table by identifying all possible directions. The next step was counting all households from the center of the area to the edge of the area. Then randomly select a number between one and the number of households counted, and that was the first household to be visited. The subsequent households were selected, according to the inclusion criteria, based on the principle of the next nearest household until sample size is reached. WHO EPI Cluster sampling method recommend this option for identifying a starting household and subsequent households when it is not feasible to get list of all households of clusters to use it as sampling frame.

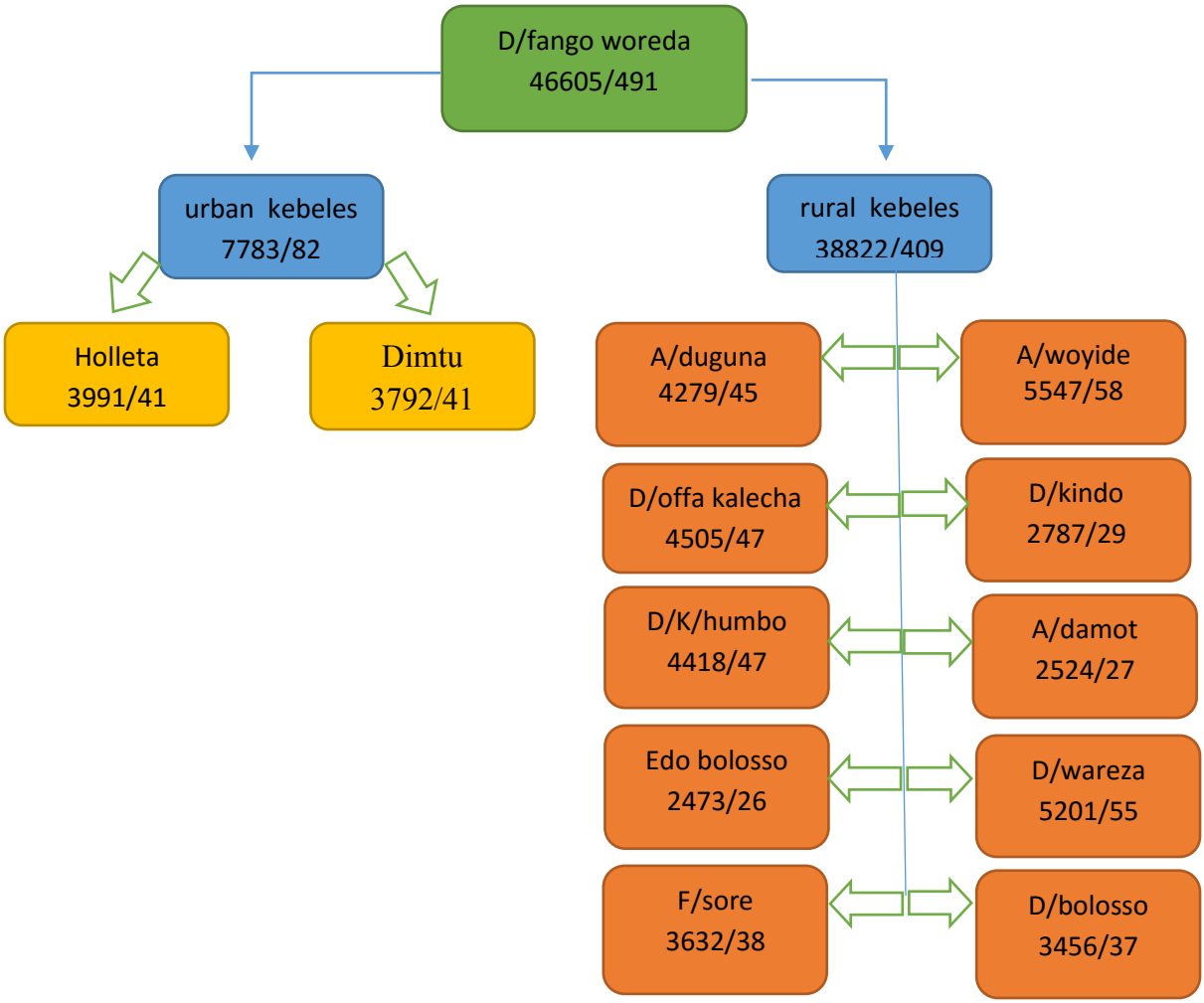


Fig 2: Diagrammatic presentation of selected kebeles from urban & rural area for survey of this Study conducted from Feb. 10 – 29, 2016 G.C. in D/fango woreda, Wolaita zone, SNNPR

4.5.Inclusion & Exclusion criteria

4.5.1. INCLUSION CRITERIA

Households that has one living children of aged between 12-23 months children who retain the vaccination card and residing in the area is included. When there are two or more children the youngest child by age were selected. If there are households with twin children one of them was selected using lottery method.

4.5.2. EXCLUSION CRITERIA

Those households who do not have or lost a vaccination card and couldn't be found in the registration form on the HFs will be excluded from the study.

4.6.Data collection tools and procedures

The questionnaire is adapted and modified from WHO, Ethiopian EPI Survey of 2011, DHS and other related previous studies questioners. It was translated into Amharic and translated back to English for consistency. The data were only be collected from the HH that a mother/caregiver with 12 - 23 months children who retained the vaccination card or registered in the HF registration book for those who lost the vaccination card are the eligible HHs hence vaccination histories of children, information on socio-demographic & economic characteristics, knowledge of mothers or immediate caretakers on vaccination, Residence, monthly income, sex of the child, accessibility and features of vaccination service, family size and Reasons for before & after the appointed time vaccination was captured into the questionnaire. The data collectors was collected the survey from the HHs that fulfills the inclusion criteria and if the HHs do have the vaccination card the data were copied directly from the card but if the HHs don't have or lost a child vaccination card the data collector filled out all the questions except the data that could be retrieved from the card and instead it was taken from the registration card from the HFs but if there existed no data in the HFs regarding the child vaccination it becomes discarded.

The child's vaccination dates, number of doses and dates of other visits to the health facility was extracted and collected either from vaccination card, if presented or registration book from the HFs. Information about mother's knowledge on vaccination and the program, and accessibility to the nearest health facility was obtain via verbal information. Respondents

that weren't available during the first visit gets a onetime revisit within the day or during the interviewer's stay in the area.

The data collectors for the surveys was recruited among BSc. Health professional working in D/fango woreda health facilities. They do speak and write Wolaytigna, Amharic, and English. They received a two days intensive training before data collection. The training was given in Amharic on how to ask and fill the question on the HH of mothers/caregiver with 12 - 23 months children and how to approach the mothers/caretakers. Before the actual data collection days, the questionnaire was pre-tested in other kebele from the sampling area for completeness and appropriateness to the local context on 5% HH and is modified accordingly.

4.7.Study variables

4.7.1. DEPENDENT VARIABLE

- Valid dose of child vaccination aged between 12-23 months

4.7.2. INDEPENDENT VARIABLE

- Socio-demographic characteristics: Age, Sex, Religion, Educational status, Marital status, Occupational status, Family size and Family income
- Knowledge of mothers/caretakers on Vaccination
- Time of travel to reach the nearest health facility and features of the service
- Perceived features of Vaccination service

4.8.Operational definitions

The following operational definitions were used:

Accessibility-The accessibility to a health facility with Vaccination facilities was measured according to mothers' time spent to reach the nearest vaccination site and the money spent on transport.

Coverage by card only: Coverage calculated with numerator based only on documented dose on Vaccination card.

Fully vaccinated- children are considered fully vaccinated when they have received a vaccination against tuberculosis (BCG), three doses each of the DPT, PCV and OPV vaccines, Two doses of Rotarix vaccine and measles vaccination by the age of 12 months.

Invalid dose: dose of vaccine received at a time interval shorter than or at younger age than recommended by WHO

Knowledge of Vaccination: If care taker/mother has awareness about vaccination, knows objectives, age at the child begin, how many visits should be made and time & intervals of vaccination session is considered as knowledgeable in each specific area.

Timeliness of dose- defined as timely doses provided before 12 months of age.

Unvaccinated- a child who does not receive any dose of the ten vaccine

Valid dose–defined as the dose being given after the minimum age and with an appropriate interval between doses according to national schedule. In case of BCG, card or history plus scar

Valid dose vaccination of child – in these study we say a child to be valid, when a child get a valid dose vaccination in any of the vaccine.

Vaccinated- a child who take at least one dose of the ten vaccine

4.9. Data quality control

Data collectors & supervisors was adequately trained for two days & also to have a bond with the questionnaire and field practice was commenced. The provision of data collection processes was closely monitored by the supervisors and the Principal Investigator. The Interview questionnaire was translated to Amharic by the Investigator and then back to English by another person and checked for the consistency between the two translations. The questionnaire was also pre-tested before the actual data collection days on 5% HHs in one of the kebele outside the study areas, out of selected kebele for main data collection called Bitena mazegaja, found in D/fango woreda. During data collection, supervisors were checking how the data collection process was going on. At the end of each data collection day, the principal investigator and supervisors checked the completeness of the filled questionnaires. Every questionnaire were checked before commencing a data entry by principal investigator.

4.10. Data processing and analysis

Data were coded before entry and data were entered & analyzed using SPSS version 20 for windows. Summary statistics, such as percentages and odds ratios, is computed and graphical techniques was also used. Bivariate analysis was done to test the association between the independent and the outcome variables. All explanatory variables that were found to be associated with the outcome variable in bivariate analyses were kept for multiple logistic regression, to determine the independent predictors of valid dose vaccination of children. Results are displayed in graphs & charts. $P<0.2$ is considered as a cut-off point for statistical significance for interpretation.

4.11. Ethical clearance

A permission to carry out the research study was received from Addis Ababa University School of Public Health Institutional Review Board and a letter of cooperation were taken from the school of public health to D/fango woreda health office. A verbal consent was taken from all the study participants. Information was given to all participants about the objective, the contents of the study, as well as their right to refuse and discontinue the data collection. Besides to this all the information collected from the study subjects is handled confidentially and data were used for the research purpose only.

5 RESULT

5.1 Socio demographic characteristics of the Study Population

A total of 491 care givers of children aged between 12-23 months were interviewed for the study of the valid dose in Duguna fango woreda & the majority 409 (83.3%) lives in rural area & 82 (16.7%) do lives in urban area. Majority of the caretaker age were found between the age of 21 and 30 which is 248 (50.5%), below age 20 years accounts for 3.5%, Age between 31 and 40 years were 176 (35.8%), age between 41 up to 50 accounts for 47 (9.6) and the remaining 3 (0.6%) were claimed that they do not know their age. Over all with mean age of 31.25 (Table 3). Concerning marital status, (96.9%) 476 of the care givers were currently married and regards to religion 373 (76%) were Protestant while 102 (20.7%) were orthodox Christians, both catholic & other Christians like Adventist, Hawariat and so on accounts 4 (0.8%) and the remaining 8 (1.6%) of them categorized for others.

Out of the total 491 interviewed, the majority 470 (95.7%) belong to the Wolaita ethnic group, Sidama 10 (2%), Oromo accounts 6 (1.6%), Hadiya accounts 1 (0.2%) and the remaining 4 (0.8%) categorized as others. Among the interviewed care givers only 93 (18.9%) can read & write, the majority 213 (43.4%) have took primary education b/n grade 1 - 8, 51 (10.4%) have took 9 -12 grade education, 18 (3.7%) were with collage &university education and the rest 116 (23.6%) were with no education. By occupation 376 (76.6%) were housewives, 44 (9%) are merchants, 30 (6.1%) are farmer which support their husbands, 35 (7.1%) were government employees and the remaining 6 (1.2%) are categorized as others.

Among the respondents most families had less than 5 members (73.1%) in which the mean family size of the study population was 3.39 and the family size ranges from 1 up to 8 with the range of 7. Of all the survey conducted in D/fango woreda, 246 (50.1%) were of the male gender. With regard to the income of respondents, 333 (67.5%) were with monthly income less than 500 birr, 84 (17.1%) have a monthly income between 500 – 999 birr and 74 (15.1%) were with monthly income greater than 1000 birr.

Table 3:- Socio demographic characteristics of the care givers in Duguna fango woreda, Wolaita Zone, SNNPR **n = 491**

Residence	Frequency	Percent
Rural	409	83.3
Urban	82	16.7
Sex of child		
Male	246	50.1
Female	245	49.9
Education level		
Illiterate	116	23.6
Read & write	93	18.9
1-8 Grade	213	43.4
9-12 Grade	51	10.4
Collage & University	18	3.7
Marital status		
Married	476	96.9
Separated	5	1.0
Widowed	10	2.0
Ethnicity		
Wolyita	470	95.7
Sidama	10	2.0
Hadiya	1	0.2
Oromo	6	1.2
Others	4	0.8
Religion		
Orthodox	102	20.8
Protestant	373	76.0
Catholic	4	0.8
Other Christians	4	0.8
Others	8	1.6
Occupation		
House wife	376	76.6
Farmer	30	6.1
government employee	35	7.1
Merchant	44	9.0
Others	6	1.2
Caretaker Age		
<20 years	17	3.5
21 – 30 years	248	50.5
31 – 40 years	176	35.8
41 – 50 years	47	9.6
I don't know	3	0.6

Number of family size	Frequency	Percent
≤4	359	73.1
≥5	132	26.9
Income		
>1000 birr	74	15.1
500 – 999 birr	84	17.1
<499 birr	333	67.5

5.2 Valid dose coverage

In this study 491 children aged 12- 23 month in Duguna fango woreda are included & mostly the coverage of all antigen shows that, all the antigens except BCG which is found to be 51.1%, are found below 30%. I.e. OPV1 (28.8%), OPV2 (25.1%), OPV3 (21%), Penta1 (29.3%), Penta2 (25.7%), Penta3 (20.8%), PCV1 (27.7%), PCV2 (24.4%), PCV3 (20.4%), Rota1 (28.7%), Rota2 (23%) and Measles (9.7%) which shows that the properly timing of child vaccination is not as such considered for the features of vaccination service. The overall prevalence of the valid dose vaccination is shown in table 4 below.

Table 4:- Percentage of children age 12-23 months who received valid dose of each antigen in Duguna fango woreda, SNNPR in February, 2016

		Total	Valid Frequency	Percent (%)
BCG		491	251	51.1%
OPV	1	491	139	28.8%
	2	491	123	25.1%
	3	491	103	21.0%
Penta	1	491	144	29.3%
	2	491	126	25.7%
	3	491	102	20.8%
PCV	1	491	136	27.7%
	2	491	120	24.4%
	3	491	100	20.4
Rota	1	491	141	28.7%
	2	491	113	23.0%
Measles		491	146	29.7%

5.3 Knowledge and Attitude on Vaccination and Vaccine preventable diseases

Of all interviewed care takers, majority 481(98%) of care givers had heard about the EPI as a specific program. care givers major sources of information include health professional (n = 98, 20%), health extension workers (n = 360, 73.3%), Radio (n = 7, 1.4%), Kebele administration (n= 12, 2.4%) and the remaining heard from other than the option listed (n= 4, 0.8%).

Mothers were asked if they took their children before & after appointed time and 15.5% of care givers took their child before appointed time & the major reason was 42 (55.3%) of care givers thought generally vaccinating of children at any time was important for the child, 13 (17.1%) claimed they have went before the appointed time b/c loss of vaccination card, 12 (15.8%) of care givers went b/c they have seen others vaccinating their child, 7 (9.2%) went b/c the HEW insisted to vaccinate their child & the remaining 2 (2.6%) are categorized in others.

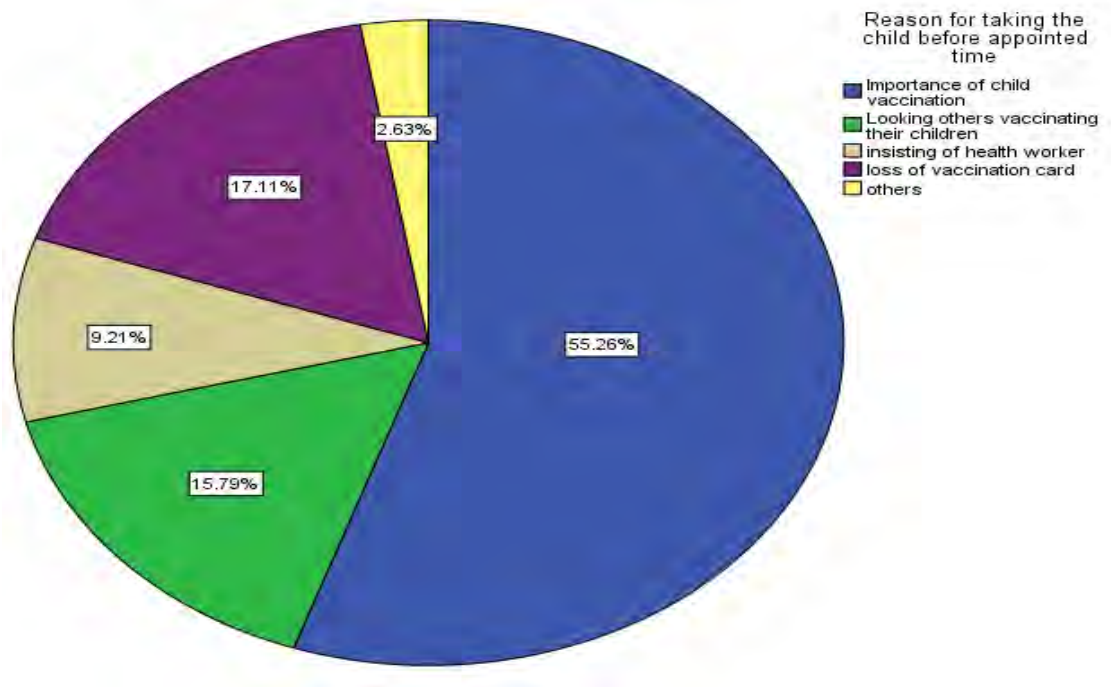


Fig. 3: Major reason why they took their child before appointed time in Duguna fango, Wolaita Zone, SNNPR

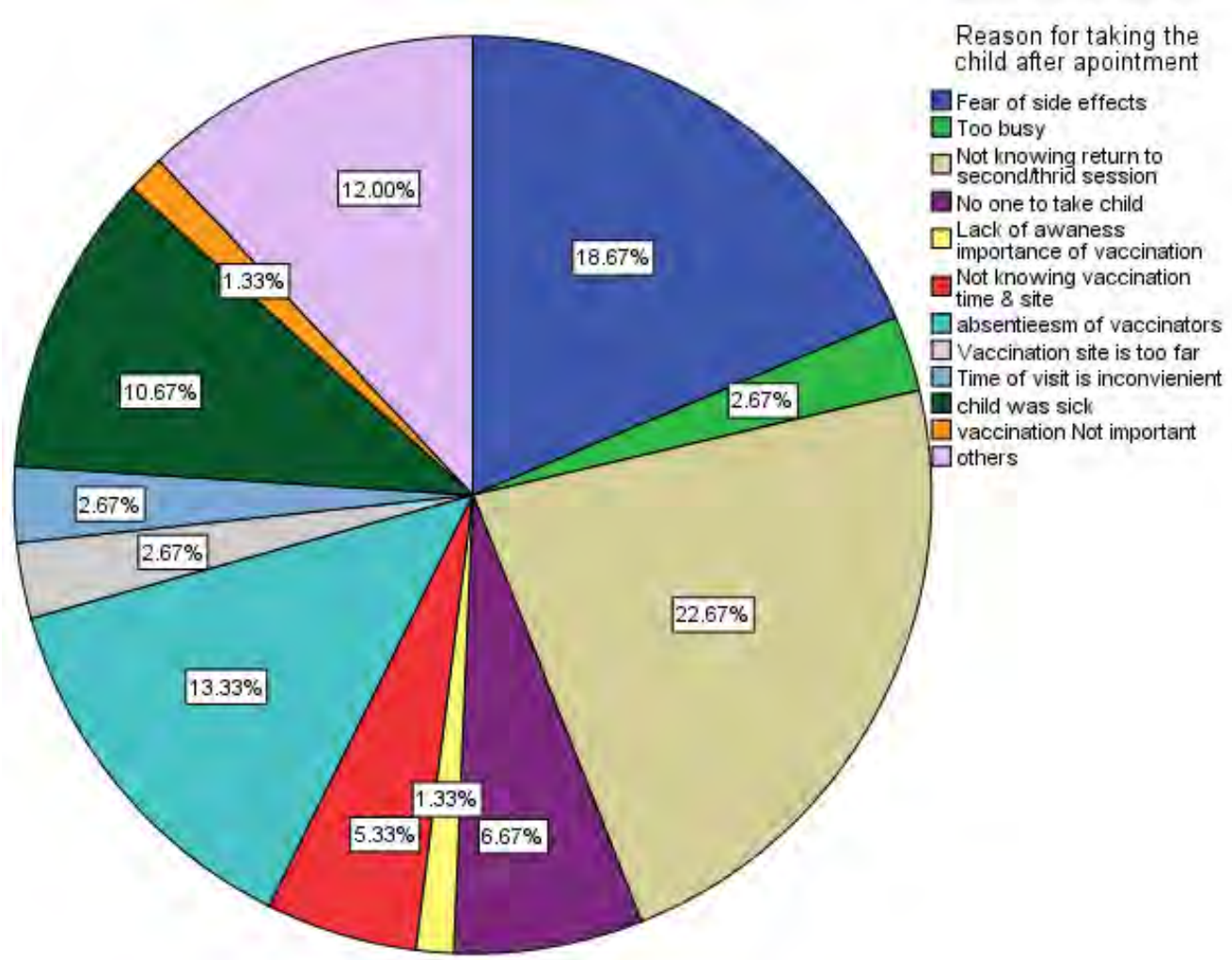


Fig. 4: Major reason why they took their child after appointed time in Duguna fango, Wolaita Zone, SNNPR

Knowledge of respondents was also assessed about how many times a child should return for getting a fully vaccinated and only13% from all the interviewed care givers properly know the amount of sessions needed, 245 (49.9%) of the care givers even do not know how many times they should take their child to vaccination site.

Table 5: Primary care taker's Knowledge on Session needed to be fully vaccinated & timing of each session in D/fango Wrd Wolita Zone, SNNPR (Next page)

Variables	Frequency	Percent
Knowledge on session needed to be fully vaccination		
One	6	1.2
Two	35	7.1
Three	71	14.5
Four	70	14.3
Five	64	13.0
I don't know	245	49.9
Knowledge on age begin the first session vaccination		
Just After birth	100	20.4
four weeks after a birth	104	21.2
six weeks after a birth	18	3.7
Other	2	0.2
I don’ know	267	54.4
Knowledge on age the second session vaccination		
four weeks after a birth	20	4.1
six weeks after a birth	112	22.8
ten weeks after a birth	52	10.6
At 9 month	12	2.4
I don't know	295	60.1
Knowledge on age the third session vaccination		
four weeks after a birth	2	0.4
six weeks after a birth	17	3.5
ten weeks after a birth	99	20.2
At 9 month	17	3.5
Others	3	0.6
I don't know	353	71.9
Knowledge on age the fourth session vaccination		
four weeks after a birth	2	0.4
six weeks after a birth	3	0.6
ten weeks after a birth	22	4.5
fourteen weeks after a birth	86	17.5
At 9 month	10	2.0
I don't know	368	74.9
Knowledge on age the fifth session vaccination		
four weeks after a birth	0	0

six weeks after a birth	0	0
ten weeks after a birth	9	1.8
fourteen weeks after a birth	0	0
At 9 month	114	23.2
Others	4	0.8
I don't know	364	74.1

5.4 ACCESSSIBILITY OF VACCINATION SERVICE

The survey conducted in the woreda showed that all care takers lived nearby health facility, Most 394 (80.2%) have closer HP, which provide Vaccination service & 97 (19.8%) respondents replied they get Vaccination service from health center. The walking time to the nearest health facility was 15-30 minutes for 244(49.7%) care takers, majority of the care takers walk to nearby health facility to get Vaccination service while 5.7 percent of them only use transportation means.

Table 6: - Accessibility of Vaccination Service in Duguna fango woreda, Wolaita Zone, SNNPR

Nearby health facility with Vaccination	Frequency	Percent
Yes	491	100
No	0	0
Type of health Facility		
Health center	97	19.8
Hospital	0	0
Health Post	394	80.2
Transportation to Health Facility		
Walk	463	94.3
By any transport	28	5.7
How long does it take to Health Facility		
Less than 15 minutes	121	24.6
15-30 minutes	244	49.7
30-1hour minute	126	25.7

5.5 Overview of Vaccination service

From all surveyed child caregivers included, most of them 421 (85.7%) of them gets an advise from the health worker which they receive a vaccination service and only 132 (31.4%) of them claimed they get a message related with valid dose the remaining caregivers 289 (68.6%) of them received message which are related with vaccination service but not regarding valid dose.

When coming to satisfaction level of the vaccination service given to the surveyed caregivers majority of them 448 (91.2%) categorized the service as good & 43 (8.8%) of them replied as medium. If the care givers did demand the vaccination service & being refused by the profession were assessed and only 29 (5.9%) of the caregivers did request to have vaccination & being refused by the professional b/c of so many reasons. The major reason that accounts 13 (44.8%) was not the vaccination day of the child, 8 (27.6%) of them were being refused b/c of No vaccination logistic were available at HF during the time, 5 (17.2%) of child were sick & 3 (10.3%) of children were being refused b/c the vaccination card was not with the child during the vaccination time. The remaining majority of the care giver 462 (94.1%) of them didn't being refused by the profession during the vaccination service is demanded. (Table 7)

Table 7:- Overview of health service in regards of valid dose vaccination in D/fango woreda, Wolayta zone of SNNPR, February, 2016

Health worker advice	Frequency	Percent
Yes	421	85.7
No	70	14.3
Area of advice		
Advice related with valid dose	132	31.4
Advice not related with valid dose	289	68.6
Satisfaction of Vaccination service		
Good	448	91.2
Medium	43	8.8
Care give demanded & refused Vaccination service by HF		
Yes	29	5.9
No	462	94.1
Reasons for the HFs refusal		
Child was sick	5	17.2
No vaccination logistic at HF during the time	8	27.6
Not vaccination day	13	44.8
Vaccination card was not brought	3	10.3

5.6 Factors associated with valid dose

This thesis more do emphasized & assessed factors affecting valid dose of child vaccination including socio demographic characteristics of mothers, child characteristics, vaccination service accessibility, quality and knowledge & attitude of caretakers on vaccination and vaccine preventable diseases. Vaccination status of children is measured according to national guideline for routine EPI schedule.

5.6.1 Socio demography factors

For more dichotomous analysis and interpretation to socio demographic factors like resident, educational status, marital status, Occupation, ethnicity, religion & age were used with valid & invalid dose. From 491 respondent 82 (14.7%) of them who live in urban area are crude OR 2.08 (1.28, 3.37) are more likely to be valid comparing the caregivers who live in rural area, Government employers crude OR 4.82 (2.31, 10.0) are more likely to vaccinate their child validly. As described below Odds of having valid dose of child vaccination were compared with the factors and Except Religion & Ethnicity, all described below shows more statistical significance with the valid dose of children.

Table 8: - Crude analysis of socio-demographic characteristics with valid dose status of vaccination among respondents in D/fango woreda,wolaita zone, SNNPR,

	Validity status		Odd Ratio
Residence	**Valid**	**Invalid**	**Crude**
Urban	38 (7.7%)	44 (9%)	2.08 (1.28,3.37)
Rural	120 (24.4%)	289 (58.9%)	1
Sex of child			
Male	87 (17.7%)	159 (32.4%)	1
Female	71 (14.5%)	174 (35.4%)	0.75 (0.51,1.09)
Educational level			
Illiterate	25 (5.1%)	91 (18.5%)	1
Read & write	29 (5.9%)	64 (13%)	1.64 (0.88,3.07)
1 – 8 grade	70 (14.3%)	143 (29.1%)	1.78 (1.05,3.01)
9 – 12 grade	20 (4.1%)	31 (6.3%)	2.34 (1.14,4.8)
Collage & University	14 (2.9%)	4 (0.8%)	12.7 (3.8,42.1)
Marital status			
Married	153 (31.2%)	323 (65.8%)	1
Separated	3 (0.6%)	2 (0.4%)	1.89 (0.39,9.02)
Widowed	2 (0.4%)	8 (1.6%)	6.0 (0.56,63.98)
Occupation			
House wife	107 (21.8%)	269 (54.8%)	1
Farmer	7 (1.4%)	23 (4.7%)	0.76 (0.32,1.8)
Government employee	23 (4.7%)	12 (2.4%)	4.82 (2.31,10.0)

Merchant	19 (3.9%)	25 (5.1%)	1.91 (1.01,3.61)
Others	2 (0.4%)	4 (0.8%)	1.25 (0.23,6.96)
Number of family size	**Valid dose**	**Invalid dose**	**Crude OR**
≤4	120 (24.4%)	239 (48.7%)	0.8 (0.52,1.25)
≥ 5	38 (7.7%)	94 (19.1%)	1
Care taker age			
Less than 20	5 (1.0%)	12 (2.4%)	0.8 (0.24,2.69)
21 – 30 years	80 (16.3%)	168 (34.2%)	0.92 (0.47,1.78)
31 – 40 years	56 (11.4%)	120 (24.4%)	0.9 (0.45,1.78)
41 – 50 years	16 (3.3%)	31 (6.3%)	1
I don't know	1 (0.2%)	2 (0.4%)	0.97 (0.08,11.51)
Income			
< 499 birr	80 (16.3%)	253 (51.5%)	1
500– 999 birr	34 (6.9%)	50 (10.2%)	2.15 (1.3,3.55)
> 1000 birr	44 (9.0%)	30 (6.1%)	4.63 (2.73,7.86)

5.6.2 Knowledge & attitude on vaccination & vaccine preventable disease factors

When coming to the knowledge & attitude towards vaccination and vaccine preventable disease, the study shows of all the one they heard about vaccination and vaccine preventable disease, who know the uses of vaccination & who can mention more than 5 types of vaccine preventable diseases are more significant to valid dose child vaccination as shown in table below.

Table 9:- Knowledge & attitude of care givers on vaccination & vaccine preventable disease in D/Fango woreda, Wolaita zone of SNNPR, February, 2016

	Validity status		**Odds Ratio**
Heard or seen about vaccination & VPD	**Valid dose**	**Invalid dose**	**Crude**
Yes	157 (32%)	324 (66%)	4.36 (0.54,34.72)
No	1 (0.2%)	9 (1.8%)	1
Source of information			
HEW	104 (21.0%)	259 (53.8%)	1
Health professional	44 (9.1%)	54 (11.2%)	2.08 (1.32,3.30)
radio	3 (0.6%)	4 (0.8%)	1.92 (0.42,8.74)
Kebele administration	6 (1.2%)	6 (1.2%)	2.56 (0.8,8.137)
I don't know	3 (0.6%)	1 (0.2%)	7.69 (0.79,74.82)

Vaccine preventable diseases	Valid dose	Invalid dose	Crude OR
Below 5 Mentioned	113 (23.0%)	261 (53.2%)	1
≥ 5 Mentioned	44 (9.0%)	54 (11.0%)	1.88 (1.15,2.96)
I don't know	1 (0.2%)	18 (3.7%)	0.13 (0.02,0.97)
Use of Vaccination			
To prevent vaccine preventable diseases	73 (14.9%)	116 (23.6%)	1.52 (0.98,2.35)
To prevent all the disease	34 (6.9%)	94 (19.1%)	0.87 (0.52,1.45)
For child health	51 (10.4%)	123 (25.1%)	1

In regards of knowledge on session needed for children to be fully vaccinated & each session time was asked & analyzed using bivariate analysis to assess the care takers knowledge towards the proper timing & valid dose of child vaccination.

Table 10:- Knowledge of Mothers on how many session needed for the child to have fully vacc. & time of each session to vaccinate a child in D/Fango woreda, Wolaita zone of SNNPR, February, 2016 (Next page)

Sessions needed for full vaccination	Validity status		Odd Ratio
	Valid dose	Invalid dose	Crude
Correctly on session needed	50 (10.2%)	14 (2.9%)	8.93 (4.55, 17.52)
Incorrect on session needed	52 (10.6%)	130 (26.5%)	1
I don't know	56 (11.4%)	189 (38.5%)	12.05 (6.21, 23.4)
First vaccination session			
Correctly answered on 1st session time	54 (11.0%)	46 (9.4%)	0.47 (0.27, 0.81)
Incorrectly answered on 1st session time	44 (9.0%)	80 (16.3%)	1
I don't know	60 (12.2%)	207 (42.2%)	1.89 (1.19, 3.03)
Second vaccination session			
Correctly answered on 2nd session time	65 (13.2%)	47 (6.9%)	0.362 (0.2, 0.65)
Incorrectly answered on 2nd session time	28 (5.7%)	56 (11.4%)	1
I don't know	65 (13.2%)	230 (46.8%)	1.77 (1.04, 3.0)
Third vaccination session			
Correctly answered on 3rd session time	60 (12.2%)	39 (7.9%)	0.224 (0.098, 0.511)
Incorrectly answered on 3rd session time	10 (2%)	29 (5.9%)	1
I don't know	88 (17.9%)	205 (54%)	1.04 (0.487, 2.216)
Fourth vaccination session			
Correctly answered on 4th session time	59 (12%)	27 (5.5%)	0.194 (0.084, 0.448)
Incorrectly answered on 4th session time	11 (2.2%)	26 (5.3%)	1
I don't know	88 (17.9%)	280 (57%)	1.35 (0.64, 2.83)
Fifth vaccination session			
Correctly answered on 5th session time	70 (14.3%)	44 (9%)	0.73 (0.23, 2.325)
Incorrectly answered on 5th session time	7 (1.4%)	6 (1.2%)	1
I don't know	81 (16.5%)	283 (57.6%)	4.07 (1.33, 12.468)

Session time Appointment	Valid dose	Invalid dose	Crude OR
Properly appointed	38 (7.7%)	1 (0.2%)	0.007 (0.001, 0.054)
Not properly appointed	45 (9.2%)	164 (33.4%)	1
Appointment not given	75 (15.3%)	168 (34.4%)	0.615 (0.4, 0.943)

5.6.3 Access & Overview of vaccination service factors

Access to HF and features of service has been dichotomized with the valid dose of children and as shown below in table, all the care givers do have available health facility with vaccination service. When coming to mode of transportation the care givers who use any of available transport in their area are 4.15 times (1.87,9.22) more likely to have a valid dose vaccination to their children and the closer the health facility the more children gets valid vaccination so way of transportation & closer distance of HF show more statistically significant.

Looking of the feature of the vaccination service factors in D/fango woreda,wolaita zone, SNNPR, the care givers who gets advise, the area of advice and the satisfaction level of the vaccination service shows statistical significance in relation to valid dose of child vaccination.

Table 11:-Accessibility of health facility with vaccination service & Overview of vaccination service factors to have a valid dose of child Vaccination D/fango woreda, Wolayita zone of SNNPR, February, 2016

	Validity status		Odd Ratio
Transportation to health facility	**Valid dose**	**Invalid dose**	**Crude**
Walk	140 (28.5%)	323 (65.8%)	1
By any transport	18 (3.7%)	10 (2.0%)	4.15 (1.87,9.22)
How long does it take to Health Facility			
Less than 15 minutes	45 (9.2%)	76 (15.5%)	1.67 (0.97,2.86)
15-30 minutes	80 (16.3%)	164 (33.4%)	1.37 (0.85,2.22)
30-1hour minute	33 (6.7%)	93 (18.9%)	1
vaccination service satisfaction			
Good	120 (24.4%)	177 (36.0%)	14.23 (1.89,107.26)
Medium	37 (7.5%)	135 (27.5%)	5.75 (0.75,44.21)
Bad	1 (0.2%)	21 (4.3%)	1

Health worker advice			
Yes	139 (28.3%)	282 (57.4%)	1.32 (0.75,2.32)
No	19 (3.9%)	51 (10.4%)	1
Area of advice			
advice not related with valid dose	42 (10.0%)	90 (21.4%)	0.92 (0.59,1.43)
advice related with valid dose	97 (23.0%)	192 (45.6%)	1

5.7 Prior factor that has Major association with valid dose

A multivariate analysis was done to pick out the major significance factor to the valid dose of children from all those becomes significance and has a crude odds in the above bivariate analysis of these factors in D/fango woreda, Wolata zone, SNNPR and as shown below in table 11, having a proper appointment has a high significance in regards of having a child to be validly vaccinated. Hence (Table 11) as shown below more give an emphasis that appointment is a prior factor that contribute the children to have a valid dose or not so the proper appointment of the care giver has 41.63 (4.45, 388.73) are more likely to get a valid dose vaccination of children in D/fango woreda, wolaita zone. Service satisfaction also shows statistical significance with valid dose of child vaccination hence respondents who gets good service satisfaction are 15.12 times (1.54, 148.05) to have a child a valid dose vaccination than who gets bad service satisfaction. The Adjusted Odd ratios are placed below for all the factors mentioned above.

Table 12:- Determinant factors of valid dose of child vaccination in D/fango woreda, Wolaita Zone, SNNPR, February, 2016

	Validity status		**Odd Ratio**
Residence	**Valid**	**Invalid**	**Adjusted**
Urban	38 (7.7%)	44 (9%)	1.68 (3.35, 8.2)
Rural	120 (24.4%)	289 (58.9%)	1
Caretaker Age			
Less than 20	5 (1.0%)	12 (2.4%)	1.24 (0.23,6.62)
21 – 30 years	80 (16.3%)	168 (34.2%)	0.28 (0.09,0.86)
31 – 40 years	56 (11.4%)	120 (24.4%)	0.8 (0.26,2.44)
41 – 50 years	16 (3.3%)	31 (6.3%)	1
I don't know	1 (0.2%)	2 (0.4%)	3.22 (0.17,60.2)
Educational level			
Illiterate	25 (5.1%)	91 (18.5%)	1
Read & write	29 (5.9%)	64 (13%)	1.22 (0.47, 3.16)
1 – 8 grade	70 (14.3%)	143 (29.1%)	1.86 (0.86, 4)
9 – 12 grade	20 (4.1%)	31 (6.3%)	1.07 (0.32, 3.59)
Collage & University	14 (2.9%)	4 (0.8%)	0.97 (0.04, 21.9)
Income			

< 499 birr	80 (16.3%)	253 (51.5%)	1
500– 999 birr	34 (6.9%)	50 (10.2%)	3.35 (1.5, 7.48)
> 1000 birr	44 (9.0%)	30 (6.1%)	3.62 (0.98, 13.4)
Vaccine preventable diseases			
Below 5 Mentioned	113 (23.0%)	261 (53.2%)	1
≥ 5 Mentioned	44 (9.0%)	54 (11.0%)	0.79 (0.33, 1.89)
I don't know	1 (0.2%)	18 (3.7%)	NI
Use of Vaccination			
To prevent vaccine preventable diseases	73 (14.9%)	116 (23.6%)	1.39 (0.7, 2.76)
To prevent all the disease	34 (6.9%)	94 (19.1%)	0.67 (0.3, 1.51)
For child health	51 (10.4%)	123 (25.1%)	1
Sessions needed for full vaccination			
Correctly on session needed	50 (10.2%)	14 (2.9%)	2.11 (0.22, 20.06)
Incorrect on session needed	52 (10.6%)	130 (26.5%)	0.48 (0.11, 2.06)
I don’t know	56 (11.4%)	189 (38.5%)	1
Session time Appointment			
Properly appointed	38 (7.7%)	1 (0.2%)	41.6 (4.45, 388.73)
Not properly appointed	45 (9.2%)	164 (33.4%)	0.65 (0.36, 1.15)
Appointment not given	75 (15.3%)	168 (34.4%)	1
Transportation to health facility			
Walk	140 (28.5%)	323 (65.8%)	1
By any transport	18 (3.7%)	10 (2.0%)	1.66 (0.26, 10.27)
How long does it take to Health Facility			
Less than 15 minutes	45 (9.2%)	76 (15.5%)	0.96 (0.41, 2.23)
15-30 minutes	80 (16.3%)	164 (33.4%)	0.88 (0.43, 1.77)
30-1hour minute	33 (6.7%)	93 (18.9%)	1
vaccination service satisfaction			
Good	120 (24.4%)	177 (36.0%)	15.12 (1.54, 148.05)
Medium	37 (7.5%)	135 (27.5%)	4.61 (0.44, 47.43)
Bad	1 (0.2%)	21 (4.3%)	1

6 DISCUSION

The valid dose coverage from this study more or less do not show that much different from the previous studies conducted nationally in 2012/13 by FMOH. Socio demographic, knowledge of the care givers and accessibility of the HFs that give vaccination service factors like Age of mothers, Residence, educational level, income, knowledge on vaccine preventable disease (VPD), use of vaccination, knowledge on appointed time, time took to the nearest HFs and vaccination service satisfaction are the major findings as mentioned in the result session above.

In line with the objective & the finding of this survey to assess the prevalence of valid dose of child vaccination and factors that contributes to valid dose in D/fango woreda, wolaita zone, SNNPR are majorly discussed here below with comparing of others related studies conducted

A study also conducted nationally as national coverage survey in 2012/13, overall coverage of valid dose by antigen is BCG 67.1%; DPT-HepB-Hib143.6%; OPV1 43.2%; DPT-HepBHib3 38.8%; OPV3 37.2%; and measles 23.8%. Of this the SNNPR coverage of valid dose by antigen is BCG 77.5%; DPT-HepB-Hib1 39.2%; OPV1 37.2%; DPT-HepBHib3 40.4%; OPV3 37%; and measles 20.3% (1). Hence comparing of the above result with this study in which the valid dose of each antigen is BCG 51.1%; DPT-HepB-Hib1 29.3%; DPT-HepB-Hib2 25.7%, DPT-HepBHib3 20.8%; OPV1 28.8%; OPV2 25.1%; OPV3 21%; ROTA1 28.7%; ROTA2 23%; PCV1 27.7%; PCV2 24.4%; PCV3 20.4%; and Measles 29.7% which show closer numbers in terms of coverage with the above previous study conducted nationally specifically with the SNNPR prevalence of valid dose of child vaccination. From the comparison we have, the factors discussed in the result that existed haven't been improved from the previous times that national study has being conducted till recent times and this implies also that there is still no change in securing of vaccinating a valid dose for children and delivering a preferred vaccination service in regards of quality of vaccination program.

When we come to socio demography characteristics of the study population, the results from all the surveyed children shows 50.1% are male & 49.9% are females and 16.7% of children do live in urban and 83.3% of children are surveyed from rural area. The survey conducted nationally among the children's mothers/care givers & the survey results in 2012 indicated that, 52.3%

were male and 47.7% were female and 85.7% of children were from rural areas and 14.3% live in urban areas (1). Majority of the care givers interviewed are found in low socio economic status.

In here the study dichotomized into "valid dose" and "invalid dose" vaccination by the dependent variable of vaccination status and an odd of having valid dose of child vaccination was compared among potential factors. Bivariate and multivariate analysis was computed to identify associated factors with dependent variable.

The study conducted in 2013 by EHNRI & FMOH revealed that valid doses for all antigens tend to be higher & statistically significant in children of caregivers with higher educational attainment, higher wealth and residing in urban areas (1). The study conducted in Armenia and Kyrgyzstan shows maternal age was associated with correctly timed DTP3 and MCV vaccinations, and children of younger mothers were more likely to have correctly timed vaccinations (12). In this study Residence, Marital status of the care giver, Educational status, Occupation, income and care givers age are statistically significance to the valid dose of children.

Care givers who have heard about vaccination & vaccine preventable diseases are 4.36 (0.54, 34.72) are more likely to have a valid dose vaccination of their child than those who haven't heard about vaccination & vaccine preventable disease. In regards of knowledge, care givers who can mention more than 5 VPD, who know the use of vaccination & who know the time of each session are statistically significant to valid dose of children vaccination. Being the care givers aware about the timing of vaccination or giving a proper appointment to the care givers is the prior significance to valid dose of child vaccination using a multivariate analysis. This implies that having a good awareness regarding valid dose results in reducing of childhood vaccinations given a few days earlier than recommended time and reduces to a substantial proportion of children to be vaccinated too early or with too short intervals between vaccine doses hence mothers that are well aware on valid dose will demand their children vaccination service at proper appointed time.

When coming the knowledge of care givers on session needed time, out of all interviewed care givers that knows the correct full session time needed are 12.05 times (6.21,23,4) more likely to have a valid dose, who knows the correct 1st session time needed are 4.89 times (3.07,7.79) more likely to have a valid dose, that knows the correct 2nd session time needed are 4.63 times (2.89,7.41) more likely to have a valid dose, care givers who knows the correct 3rd session time needed are 6.95 times (4.15,11.6) more likely to have a valid dose, who knows the correct 4th session time needed are 5.55 times (3.54,8.72) more likely to have a valid dose vaccination of their children and care giver that knows the correct 5th session time needed are 4.05 times (2.48,6.59) with 95% CI are more likely to vaccinate their children validly. Thus it indicates that if the community is well aware in regards of how many sessions are needed and knows the proper vaccination time each sessions, the probability of having a children to get a valid dose will also increase. Properly appointing of the care givers for the coming session is also 85.1 (11.5, 631.5) times more likely to be valid than those who do not being given an appointment hence the more the care givers properly know their appointed day the more children get a valid dose of vaccination.

Regarding access and overviews of immunization service, unlike a study conducted in Nigeria that revealed accessibility as a function of distance and need for using transport were not significantly associated with vaccination (17), this study shows the more the HF distant from the care giver the lower their children to have a valid dose i.e. the distant that take less than 15 minute is 1.67 times (0.97, 2.86) more likely to have a valid dose of child vaccination.

7 STRENGHT & LIMITATION

- **Strength: -** Only Children aged between 12-23 months were included in the study which shows recent Vaccination program performance and reduce recall bias.

  : - The survey was community based so that particularly the socio-demographic and economic variables were more credible since the respondents for these variables were adult people.

  : - Vaccination card retention is 82.5% which make the study more acceptable.

- **Limitation: -** The study had some limitations which included recall bias where the care givers might not exactly remember the vaccination status of their children
  - - The study participants may create social desirable bias during the interview.
  - - Use of health professional as data collectors may create bias as they might direct the respondents during the interview.

8 CONCLUSION

- ✓ There exist low prevalence of valid dose vaccination among children aged 12 – 23 month in D/fango woreda, wolaita zone, SNNPR.
- ✓ Care givers who have heard message related with valid dose vaccination of children, Advice given related with valid dose of children is low & most of the care givers do not know the proper use of vaccination.
- ✓ Majority of the caretakers are satisfied by the HF vaccination service which is good in vaccination service delivery.
- ✓ Marital status of the care giver, Educational status, Occupation, income, proper appointment, knowledge on each session time, Accessibility of HFs with vaccination service and vaccination service satisfaction were statistically significant with valid dose of child vaccination.
- ✓ Factors related with socio demographic such as Religion, sex of the child & Ethnicity of the care givers showed no significant association with valid dose of child vaccination.
- ✓ The major source of information about vaccination service are the HEW & health professional that get vaccination at HC/Hospital.

9 RECOMMEDATION

- Low prevalence of valid dose in the study area indicates that vaccinators do not adequately screen children before administering vaccines. Thus, observations and close monitoring of EPI sessions need to be performed to improve the quality of services.
- The woreda health office integrating with the zone, an advocacy meeting, social mobilization works on valid dose of child vaccination should held to improve the prevalence of valid dose.
- Since majority of the community members in each HHs utilize a mobile phone hence key messages related with valid dose vaccination can easily be addressed.
- Wolaita zone health department, D/fango woreda health office & HFs under these woreda should work strong and intensive awareness creation activities on these contributing major factors to improve a valid dose vaccination of children in their area and also refresher training is equally important to enhance the knowledge and skills of vaccinators to give a quality vaccination service to the community.
- Working on health professionals & HEW on improving the skills for giving an advice related with the proper returning time for next session & use of valid dose vaccination.
- Involving kebele, woreda & zone politically assigned leaders, others governmental officials, sector offices & media stations to improve the involvement of these sectors for dissemination of any information that is related with valid dose vaccination of child.
- Ensure women development army, 1 to 5 network & HEW on providing the information about the importance of valid dose vaccination.
- Sustain strengthen & capacitating the HP good way of service delivery system to the community in order to increase the routine EPI service demand.

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ANNEX I. Ethiopian national Routine EPI schedule

National Routine EPI schedule					
Vaccine	At birth	At 6 weeks	At 10 weeks	At 14 weeks	At 9 months
BCG	√				
OPV	√	√	√	√	
PCV + PENTA (DPT-Hepb-Hib)		√	√	√	
ROTA		√	√		
MEASELS					√

ANNEX II. QUESTIONNAIRES IN ENGLISH AND AMAHARIC VERSION

1. A Questionnaire for the Study of valid dose of child vaccination & its associate factors among children aged 12-23 months in D/fango woreda, Wolayita Zone, SNNPR, February, 2016

Addis Ababa University, College of Health Sciences, School of Public Health

Informed Consent Statement

My name is _____. I am conducting a study on valid dose of child vaccination & its associate factors in D/fango woreda with Addis Ababa University.I am enrolled for interviewing randomly selected mothers and care takers that have children aged 12-23 months with Vaccination card for the study.I am delighted to inform you that you are one of eligible participant and chosen to take part in the study. I would like to tell you that your participation in the study is very crucial for the study out come.For this purpose certain questions which are thought to be important will be asked. You are kindly required to respond to these questions. We want to assure you that your answers will be strictly kept secret. We will also do not keep a record of your name or address. Participation in this survey is voluntary and you have the right to refuse participation at any time or not to respond to questions that you are not willing to answer. However, your honest answers to these questions will help us in identifying determinant factors forimproper timing of child vaccination. We would appreciate your help in responding to these questions, and the interview will not take more than 30 minutes.Are you willing to participate in the study?

1) Yes… 2) No ----

02:- Selected Household having children age 12-23 months (Born between -&---)1= yes----2=no-

03-.study area: - zone----------woreda/Town---------- kebele----------house number-----

04:-. Date of interview ___/___/___ Time _____

05. Interviewer: Code __/__/ Name _____

PART ONE: - SOCIO - DEMOGRAPHIC & ECONOMIC CHARACTERISTICS			
No.	Questions	Responses	Code
1	Child date of birth	1)____ day____ month____ year 2) Don't know[if recorded on vaccination card, replace 'don't know' response with date indicated on the card)	**SD1**
2	Age of child in months	_____months	**SD2**
3	Sex of the child	1) male 2) female	**SD3**
4	Family size	male_____female_____	**SD4**
5	How many living children do you have currently?	Number of children _____	**SD5**
6	Residence	1) Rural 2) Urban	**SD6**
7	Mother's marital status	1) single 2) married 3) separated 4) divorced 5) widowed	**SD7**
8	Who is the primary caretaker of the child?	1) Mother 2) Father 3)Other(SPECIFY)____	**SD8**
9	Are you the primary care taker of the child?	1) Yes 2) No	**SD9**
10	What is the age of primary care taker?	1)-------years 99) No response 88) I don't know	**SD10**
11	What is educational status of caretaker?	1) illiterate 2) read and write 3) grade 1-8 4) grade 9-12 5) college/university	**SD11**
12	What is the occupation of the primary caretaker?	1) House wife 2) Farmer 3) Gov't employee 4) Merchant 5) Daily laborer 6) Others specify_____	**SD12**
13	What is the occupation of the child father?	1) Teacher 2) Farmer 3) Merchant 4) Other gov't employee 5) Private employee/NGO 6) Daily laborer 7) Unemployed 8) Other (specify)_____	**SD13**
14	What is the religion of the primary caretaker?	1) Orthodox 2) Muslim 3) Protestant 4)Catholic 5) Non Religion 6) Other	**SD14**

		Christians 7) Other _____	
15	What is the Ethnicity of the primary caretaker?	1) wolyita 2) Sidama 3) Hadiya 4) kemibata 5) Dawro 6) oromo 7) Others ---------- 99) No response 88=I don't know	**SD15**
16	Do you have television and/or radio?	TV 1) Yes 2) No	**SD16**
		Radio 1)Yes 2) No	**SD17**
16	Do any of your family member use mobile phone?	1) Yes 2) No	**SD18**
17	How much is the monthly income of the household? (in Ethiopian birr)	_____ETB	**SD19**

PART TWO: - VACCINATION KNOWLEDGESTATUS

No.	Questions	Responses	Code
18	Do you heard or seen about vaccination and vaccine preventable disease?	1) Yes 2) No….**Skip to Qes.(20)**	**K1**
19	If yes to above question, from where do you heard about the vaccination and vaccine preventable disease? (Multiple response possible)	1) Community members 2) Health workers at health facility 3) Health extension workers 4) Radio 5) TV 6) News paper 7) Kebele administrator paper 8) Other government official 9)Others (specify) _____ 99=No response 88=I don't know	**K2**
20	What messages have you heard aboutvaccinations?(Multiple response possible)	1)About session dates & target groups 2) Importance of routine vaccination 3) Where to get routine vaccination 4) Age to get routine vaccination 5) Return for the next doses of the routine vaccination	**K3**

		6) About new vaccines introduction (Rota/IPV vaccines) 7) Other, specify _____ 99) No response 88) I don't know	
21	Can you mention the benefit of vaccinating a child? (Multiple response possible)	1) To prevent all the disease 2) To prevent specifically vaccine preventable disease 3) for child health 4) other, specify _____ 99=No response 88=I don't know	**K4**
22	What vaccine preventable diseases do you know?	1) Measles 2) Diphtheria 3) Polio 4) Tetanus 5) Pertussis 6) Hepatitis B 7) Homophiles influenza B 8) pneumonia 9)Diarrhea 10) Tuberculosis 99) No response 88) I don't know	**K5**
23	How many vaccination sessions are needed for a child to be fully protected?	1) One 2) Two 3) Three 4) Four 5) Five 99) No response 88) I don't know	**K6**
24	Do you tell me the age at which the child begins the first session?	1) just after birth 2) four weeks after a birth 3) six weeks after a birth 4) other specify_____ 99) No response 88) I don't know	**K7**
25	Do you tell me at what age of the child getssecond session?	1) four weeks after a birth 2) six weeks after a birth 3) Ten weeks after birth	**K8**

		4) At 9 month 5) other specify_____ 99) No response 88) I don't know	
26	Do you tell me at what age of the child getsthird session?	1) four weeks after a birth 2) six weeks after a birth 3) Ten weeks after birth 4) At 9 month 5) other specify_____ 99) No response 88) I don't know	**K9**
27	Do you tell me at what age of the child getsfourth session?	1) four weeks after a birth 2) six weeks after a birth 3) Ten weeks after birth 4) Fourteen weeks after birth 5) At 9 month 6) other specify_____ 99) No response 88) I don't know	**K10**
28	Do you tell me at what age of the child getsfifth session?	1) four weeks after a birth 2) six weeks after a birth 3) Ten weeks after birth 4) At 9 month 5) other specify_____ 99) No response 88) I don't know	**K11**
29	At what age the child should complete		**K12**

	Vaccination?	**month**	
30	Have you ever refused the child vaccination in time of session conducted?	1) Yes 2) No…**Skip to Qes.(32)**	**K13**
31	If yes to above question what was the reason??	1) Child was sick 2) Child will cry & disturb 3) Time of the subsequent vaccination did not reached 4) Fear of side effects 5) Others (specify) 99) No response 88) I don't know	**K14**
32	Have you ever taken child before the appointed time to get aVaccination?	1) Yes 2)No…**Skip to Qes.(34)**	**K15**
33	If yes to above question what was the reason??	1) Importance of child vaccination 2) When shifting of living area to other 3) When looking of others vaccinating their child 4) Insisting of the health worker 5) Loss of child Vaccination card at a time of vaccination 6) Others (Specify)_____ 99) No response 88) I don't know	**K16**
34	Have you ever taken child after the appointed time to get aVaccination?	1) Yes 2) No…. **Skip to Qes.(36)**	**K17**
35	If yes to above question what was the reason??	1) Fear of side effects 2) Too Busy 3) Not knowing whether to come back for	**K18**

		second and third vaccination 4) No one to take child 5) Lack of awareness on the importance of vaccination 6) Not knowing vaccination time and site 7) Absenteeism of vaccinators 8) Vaccination site is far-away 9) Time of visit was inconvenient 10) Child was Ill 11) Not Important 12) Others (Specify)_____99) No response 88) I don't know	

PART THREE: - ACCESS AND FEATURES OF VACCINATION SERVICE

NO.	Questions	Responses	Code
36	Is there any nearby health facility that provides vaccination service?	1) Yes 2) No…. **Skip to Qes.(38)**	**AQ1**
37	If yes to above question which health facility is near to you?	1) health center 2) hospital 3) health post 4) private clinic	**AQ2**
38	What means of transportation do you usually use to come to this facility?	1) Walk….. **Skip to Qes.(41)** 2) By any transport	**AQ3**
39	if the above answer is by any transportation means does it incur you any cost	2) Yes 2) No	**AQ4**
40	How long does it take you to reach nearby health facility by transportation in minutes?	1) Less than 15 min. 2) 15-30 minutes 3) 30-1hour minute 4)> 1 hour 99) No response	**AQ5**

		88) I don't know	
41	Did the health worker give you advice about vaccination?	1) Yes 2) No…… **Skip to Qes.(43)**	**AQ6**
42	If yes to above question what were the area of advice?	1) Importance of routine vaccination 2) Importance of valid dose vaccination 3) Age to finish routine vaccination 4) Return for the next doses of the routine vaccination 5) about new vaccines (pneumococcal/rotavirus vaccine) 6) other, specify _____ 99) No response 88) I don't know	**AQ7**
43	How do you rate the satisfaction of Vaccination service you get?	1) Good 2) Medium 3) Bad 99) No response 88) I don't know	**AQ8**
44	Have you ever requested vaccination service for this child and been refused?	1) Yes 2) No…… **Skip to Qes.(46)**	**AQ9**
45	If YES, why didn't they vaccinate the child?	1) The doctor/nurse/HEW said it couldn't be done because the child was sick 2) There were no vaccines, or there were no syringes or some other supply needed for vaccination 3) It was not a vaccination day 4) The person in charge of vaccination was not there 5) We didn't have the vaccination card with us in vaccination time	**AQ10**

		6) The visit was not in the vaccination day 7) The hours and days for vaccination were limited 8) Other Specify: _____ 99) No response 88) I don't remember	

PART FOUR: - CHILD VACCINATION

NO.	Questions	Responses	Code
46	Does your child take any vaccination?	1) Yes 2) No	**CV1**
47	IF yes to above question Do you have a card where vaccinations are written down?	1) Yes 2) No	**CV2**
48	Copy the Vaccination data from the card(or from health facility register if the card is lost)		**CV3**

Vaccine taken	Is it valid dose?	Child date of vaccination
BCG	1) Yes 2)No	/ /
OPV0	1) Yes 2)No	/ /
OPV1	1) Yes 2)No	/ /
OPV2	1) Yes 2)No	/ /
OPV3	1) Yes 2)No	/ /
Pentavalent1	1) Yes 2)No	/ /
Pentavalent2	1) Yes 2)No	/ /
Pentavalent3	1) Yes 2)No	/ /
Measles	1) Yes 2)No	/ /
PCV 1	1) Yes 2)No	/ /
PCV 2	1) Yes 2)No	/ /
PCV3	1) Yes 2)No	/ /

		Rota 1	1) Yes 2)No	/ /
		Rota 2	1) Yes 2)No	/ /
49	Copy the appointment dates of the child from Vaccination card	1st _____ 2nd _____ 3rd _____ 4th _____ 99) Non written	1) Not properly appointed 2) Properly appointed	**CV4**
50	Based on the data from the Vaccination card, was there valid dose of child vaccination exist in any of the vaccine?	1) Yes 2) No		**CV5**

To be filled by the interviewer

Code of the questionnaire----------

Name of the interviewer----------

Signature of the interviewer----------

Date of the interview----------

To be filled by the supervisor

Name of the supervisor----------

Questionnaire Complete ☐ Incomplete ☐

Incorrect parts ---------- ---------- ----------

Corrections to be made---------- ---------- ----------

Checked by Supervisor: Signature _____

Date ____/____/2008 E.C

አዲስ አበባ ዩኒቨርስቲ የጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና ትምህርት ክፍል

ጊዜውን የጠበቀ ክትባትና ተያያዥነት ያላቸው ምክንያቶችለማጥናት የተዘጋጀ መጠይቅ
ታህሳስ,2008 ዓ.ም

የስምምነት ቅጽ

ስሜ----------ይባለል፡፡የአዲስ አበባ ዩኒቨርስቲ እያካሄደ ባለው ሰይንሳዊ ጥናት ውስጥ የጥናት ቡድን አባል በመሆን በመስራት ላይ እገኛለው፡፡ ጊዜውን የጠበቀ ክትባትና ተያያዥነት ያላቸው ምክንያቶች ላይ በድጉና ፋንጎወረዳ ጥናት እያካሄድን ነው፡፡በዚህ ጥናት ላይ የሚሳተፉት በአጋጣሚ የተመረጡ እድሜቸው ከ 12-23 ወራት የሚሆኑ ህጻናት እናቶች ወይም አሳዳጊዎች እና የክትባት ካርድ ያላቸው ሲሆኑ ለዚህ ዓላማ ሲባል የተዘጋጁትን ጥቂት ጥያቄዎች በመመለስ እርሶዎ እንዲተባበሩን እንጠይቃልን፡፡የሚሰጡት መልስ በሚስጥረነት የሚያዝ ሲሆን ስም ሆነ አድራሻ ተመዝግቦ አይያዝም፡፡በጥናቱ ያለመሳተፍ መብትዎ የተጠበቀ ሲሆን እንደዚሁም በማንኛውም ጊዜ አለመሳተፍና መልስ ሊሰጡባቸው የማይፈልጉ ጥያቄዎች ካሉአለመመለስ ይችላሉ፡፡ሆኖም የሚሰጡት እውነተኛ መልስ ጊዝውን ስለጠበቀ ክትባት ዙሪያ ያሉ ዋና ዋና እንቅፋቶችን ለማወቅና የክትባት አገልግሎትን የበለጠ ለማሻሻል ትልቅ ጠቀሜታ እንዳለው ላረጋግጥለዎት እወዳለሁ፡፡በመጨረሻም ለሚሰጡት መልስ በቅድሚያ እያመሰገንኩ በአጠቃላይ መጠየቁ ከ 30 ደቂቃ በላይ እንደማይወስድ እገልጸሎታለሁ፡፡በዚህ ጥናት ላይ ለመሳተፍ ፍቃደኛ ኖዎት

1) አዎ 2) አይደለሁም

2) የተመረጠው መኖሪያ ቤት ውስጥ እድሜቸው ከ 12-23 ወራት የሚሆኑ ህጻናት(ከ------እስክ-----የተወለዱ) 1) አሉ 2) የሉም

3) የተሳታፊ መኖሪያ ቦታ 1) ዞን_____2) ወረዳ/ከተማ_____3) ቀበሌ_____
4) የቤት ቁጥር_____

4) መጠይቁ የተሞላበት ጊዜ (ቀን/ወር/ዓ.ም) _____/___/2008 ዓ.ም ሰአት

5) መጠይቁን የሚሞላው ኮድ ___/___/ ስም_____

ክፍል አንድ ፡-የማህበራዊ፣ የስነ ህዝብና የኢኮኖሚ መጠይቅ			
ተ.ቁ	ጥያቄ	መልስ	ኮድ
1	ህፃኑ የተወለድበት ቀን	1) _____ ቀን_____ ወር _____ ዓ.ም 88) አለወቅም(የክትባት ካርድ ላይ የተመዘገበ ቀን ካለ አለውቅም የሚለውን ምለሽ ካርዱ ላይ ባለው ቀን ይተኩት)	SD1
2	የህፃኑ እድሜ በወራት (ከ12ወራት በታች ለሆኑ ህጻናት)	_____ወራት_	SD2
3	የህፃኑ ጾታ	1) ወንድ 2) ሴት	SD3
4	የቤተሰቦሞ ብዛት ስንት ነው	1) ወንድ_____ 2) ሴት_____	SD4
5	በህይወት ያሉ በእናትየው የተወለዱ ህጻናት ብዛት	_____	SD5
6	የመኖርያ አካባቢ	1) ገጠር 2) ከተማ	SD6
7	የእናትየው የጋብቻ ሁኔታ	1)ያገባች 2) ያላገባች 3) የተለያየች 4) የተፋታች 5) የሞተባት	SD7
8	የህፃኑ ዋና አሳዳጊ/ተንከባካቢ ማነው?	1) እናቱ 2) አባቱ 3) ሌላ_____	SD8

9	እርሶ (መጠይቁን የሚመልሰው) ዋና የህጻኑ አሳዳጊ/ተንከባካቢ ኖት	1) አዎ 2) አይደለም	SD9
10	የዋና አሳዳጊ/ተንከባካቢ እድሜ ስንት ነው?	1) -------አመት 99) መልስ የለም 88) አለውቅም	SD10
11.	የዋና አሳዳጊ/ተንከባካቢ የትምህርት ደረጃ	1) ያልተመሩ 2) ማናበብና መጻፍ የማይችሉ 3) ከ 1-8ኛ ክፍል 4) ከ9-12 ክፍል 5) ኮሌጅና ዩኒቨርስቲ	SD11
12	የዋና አሳዳጊ/ተንከባካቢዋናው ስራው ምንድነው?	1) የቤት እመቤት 2) አርሶ አደር 3) የመንግስት ሰራተኛ 4) ነጋዴ 5) የቀን ሰራተኛ 6) ሌላ _____	SD12
13	የህጻኑ አባት ዋናው ስራው ምንድነው?	1) አስተማሪ 2) አርሶ አደር 3) ነጋዴ 4) የመንግስት ሰራተኛ 5) የግል ስራ/ መያድ 6) ቀን ሰራተኛ 7) ስራ አጥ 8) ሌላ _____	SD13
14	የየትኛው ሃይማኖት ተከተይ ነዎት?	1) ኦረቶዶክስ 2) ሙስሊም 3) ፕሮቴስታነት 4) ካቶሊክ 5) ሀይማኖት ቢስ 6) ሌላ ክርስቲያን 7) ሌላ _____	SD14
15	የየተኛዉ በሄረሰብ አባል ነዎት?	1) ወላይታ 2) ሲዳማ 3) ሀዲያ 4) ከምባታ 5) ዳውሮ 6) አሮሞ 7) ሌላ ---------- 99) መልስ የለም 88) አለውቅም	SD15

16	ቴልቪዥንወይምሬዲዮበቤትዎ አለዎት?	ቲቪ 1) አዎ 2)የለም	SD16
		ሬዲዮ 1) አዎ 2) የለም	SD17
16	በቤትዎ		SD18
17	አማካኝ የቤተሰቡ የወር ገቢ ስንት ነው(በኢት. ብር)	_____ኢት. ብር	SD19

ክፍል ሁለት: - በክትባት አገልግሎት ላይ እውቀትና አመለካከት መጠይቅ

ተ.ቁ	ጥያቄ	መልስ	ኮድ
18	ስለ ክትባትና በክትባት ልንከላከላቸው ስለ ምንችላቸው በሽታዎች ስምተው ወይም አይተው ያውቃሉ?	1) አዎ 2) አላውቅም.....(ወደ ጥያቄ 20 ይሂዱ)	K1
19	ለጥያቄ 18 መልሶ አዎ ከሆነ ከየት ነው የሰሙት?(ከአንድ በላይ መለስ ይቻላል)	1) ከህብረተሰቡ 2) ከጤና ባለሞያ 3) ከጤና ኤክስቴንሽን ባለሞያዎች 4) ሬዲዮ 5) ቲቪ 6) ጋዜጣ 7) ከቀበሌ አስተዳደር 8) ከመንግስት ሃላፊ 9. ሌላ _____ 99) መልስ የለም 88) አለውቅም	K2
20	ምን አይነት መልእክት ነው የስሙት?(ከአንድ ባለይ መለስ ይቻላል)	1) ስለ ዘመቻ(ቀን፣የተከታቢው አይነት) 2) የክትባት ጠቀሜታ 3)ከየት የክትባት አግልግሎት እንደሚያገኙ4)ማስከተቢያ እድሜ 5)ስንት ጊዜ ክትባት እንደሚወሰድ	K3

		6)ሰለ አዳዲስ ክትባቶች (ሮታ፣ባለመርፌ ፖ'ለዮ) 7)ሌላ _____ 99) መልስ የለም 88) አለውቅም	
21	የክትበትን ጠቀሜታ መግለጽ ይችላሉ? (ከአንድ ባለይ መለስ ይቻላል)	1) ማንኛውንም በሽታን ለመከላከል 2) በክትባት መከላከል የምንችላቸውንበሽታዎች ለመከላከል 3) ለህፃኑ ጤንነት 4) ሌላ _____ 99) መልስ የለም 88) አለውቅም	K4
22	በክትባት መከላከል ከምንችላቸው በሽታዎች የትኞቹን ያውቃሉ? (ከአንድ ባለይ መለስ ይቻላል)	1) ኩፍኝ 2) ጆሮ ደግፍ 3) የልጅነት ልምሻ 4) መንጋጋ ቆልፍ 5) ትክትክ6)ሄፓታይተስ ቢ 7)ሄሞፊለስ ኢንፉሌንዛ 8)ኒሞኒያ 9) ተቅማጥ 10) የቲቢ በሽታ 99) መልስ የለም 88) አለውቅም	K5
23	ህጻኑ ሙሉ ክትባት ወስዶ እንዲጨርስ ስንት ጊዜ መመላለስ ይጠበቅበታል?	1) አንድ 2) ሁለት 3) ሶስት 4) አራት 5) አምስት 99) መልስ የለም 88) አለውቅም	K6

24	ህጻኑ ክትባት መቼ እንደሚጀመር ያውቃሉ?	1) ልክ እንደ ተወለደ 2) ከተወለደአራት ሳምንት በኃላ 3) ከተወለደ ከስድስት ሳምነት በኃላ 4) ሌላ---------- 99) መልስ የለም 88) አለውቅም	K7
25	ህጻኑ ሁለተኛ ዙር ክትባት መቼ መውሰድ እንዳለበትያውቃሉ?	1) ከተወለደበአራተኛው ሳምንት 2) ከተወለደበስድስተኛው ሳምንት 3) ከተወለደ በአስረኛው ሳምነት 4)በ ዘጠነኛው ወር 5) ሌላ---------- 99) መልስ የለም 88) አለውቅም	K8
26	ህጻኑ ሶስተኛ ዙር ክትባት መቼ መውሰድ እንዳለበትያውቃሉ?	1) ከተወለደበአራተኛው ሳምንት 2) ከተወለደበስድስተኛው ሳምንት 3) ከተወለደ በአስረኛው ሳምነት 4)በ ዘጠነኛው ወር 5) ሌላ---------- 99) መልስ የለም 88) አለውቅም	K9
27	ህጻኑ አራተኛ ዙር ክትባት መቼ መውሰድ እንዳለበትያውቃሉ?	1) ከተወለደበአራተኛው ሳምንት 2) ከተወለደበስድስተኛው ሳምንት 3) ከተወለደ በአስረኛው ሳምነት 4) ከተወለደ በአስራአራተኛው ሳምንት 5)በ ዘጠነኛው ወር	K10

		6) ሌላ---------- 99) መልስ የለም 88) አለውቅም	
28	ህጻኑ አምስተኛ ዙር ክትባት መቼ መውሰድ እንዳለበት ያውቃሉ?	1) ከተወለደበአራተኛው ሳምንት 2) ከተወለደበስድስተኛው ሳምንት 3) ከተወለደ በአስረኛው ሳምነት 4)በ ዘጠነኛው ወር 5) ሌላ---------- 99) መልስ የለም 88) አለውቅም	K11
29	በምን ያህል እድሜው ህጻኑ ክትባቱን ይጨርሳል ብለው ያስባሉ?		K12
30	ከዚህ በፊት ህፃኑን ክትባት ላለማሰጠትወስነውያውቃሉ?	1) አዎ 2) አላውቅም.....(ወደ ጥያቄ 32 ይሂዱ)	K13
31	የጥያቄ 30 መልስ አዎ ከሆን ምክንያቱ ምን ነበር ?(ከ አንድ ባለይ መለስ ይቻላል)	1) ህፃኑን አመመት ስለነበር 2) ሲከተብ ህጻኑ ስለሚያለቅስ እና ስለሚረብሽ 3) የክትባቱ ቀጠሮ ክትባት በሚሰጥበት ስላልደረሰ ስላልደረሰ 4) የጎንዮሽ ችግሮችን ፈረቹ 5)ሌላ_____ 99) መልስ የለም 88) አለውቅም	K14
32	ከተቀጠሩበት ቀን ቀደም ብለው ህጻኑን ለክትባት	1) አዎ 2) አላውቅም.....(ወደ	K15

	ወደ ክትባት መስጫ ቦታ ወስደውት ያውቃሉ	ጥያቄ 34 ይሂዱ)	
33	የጥያቄ 32 መልስ አዎ ከሆን ምክንያቱ ምን ነበር ?(ከ አንድ ባለይ መለስ ይቻላል)	1) ክትባት ስለሚጠቅም 2) የመኖርያ አድራሻ ቀይሬ ስለነበር 3) ሌሎች ሲያስከትቡ ስላየሁኝ 4) ከታቢዋ እንዳስከትብ ስለጎተጎተችኝ 5) የክትባት ካርዱን በጊዜው ጠፍቶ ስለነበር 6) ሌላ_____ 99) መልስ የለም 88) አለውቅም	K16
34	ከተቀጠሩበት ቀን ዘግየት ብለው ህጻኑን ለክትባት ወደ ክትባት መስጫ ቦታ ወስደውት ያውቃሉ	1) አዎ 2) አላውቅም.....(ወደ ጥያቄ 36 ይሂዱ)	K17
35	የጥያቄ 34 መልስ አዎ ከሆን ምክንያቱ ምን ነበር ?(ከ አንድ ባለይ መለስ ይቻላል)	1) የጎንዮሽ ችግሮችን ፈረቹ 2) የማስከተቢያ ጊዝ ስላልነበረኝ 3) ለሁለተኛ ወይም ለሶስተኛ ዙር በድጋሚ ክትባት ማግኘት እንደነበረበት ስላላወኩኝ 4) ህጻኑን ሚወስድ ሰው ስላልነበር 5) የክትባትን ጥቅም ባለማቅ ምክንያት 6) የክትባት መስጫ ቦታ እና ጊዜውን አለማወቅ 7) ከታቢዎች ባሉት ጊዜ አለመገኘት 8) የክትባት መስጫ ቦታው በጣም ሩቅ በመሆኑ 9) አመቺ ባልሆኑ ጊዜያቶች ላይ	K18

		ክትባቱ ስለሚሰጥ 10) ህፃኑን አመምት ስለነበር 11) አላስፈላጊ ስለሆነ 12) ሌላ_____ 99) መልስ የለም 88) አለውቅም	
ክፍል ሶስት: - የክትባት አገልግሎት ተደራሽነትና ጥራት የሚደስስመጠይቅ			
ተ.ቁ	ጥያቄ	መልስ	ኮድ
36	በቅረበት የሚገኝ የክትባት አገልግሎት የሚሰጥ ጤና ተቋም አለ?	1) አለ 2) የለም.....(ወደ ጥያቄ 38 ይሂዱ)	AQ1
37	ለጥያቄ 36 መልሱ አለ ከሆነ ምን አይነት ተቋም ነው?	1) ጤና ጣቢያ 2) ሆስፒታል 3) ጤና ኬላ 4) የግል ክሊኒክ	AQ2
38	የጤናተቋሙ ለመድረስ ምን አይነት የማንጓጃ መንገድ ነው የምትጠቀሙት?	1) በአግር ጉዞ...(ወደ ጥያቄ 41 ይሂዱ) 2) በመጓጓዣ ዘዴ	AQ3
39	ለጥያቄ 38 መልሱ በመጓጓዣ ዘዴ ከሆነመጓጓዣ ለመጠቀም ወጪ የስወጣል?	1) አዎ 2) አያሶጣም	AQ4
40	የጤና ተቋሙ በመጓጓዣ ለመድረስ ምን ያህል ጊዜ ይወስዳል በደቂቃ?	1) ከ 15 ደቂቃ በታች 2) ከ15-30 ደቂቃ 3) ከ30-1አንድ ሰአት 4)> 1 ከ አንድ ሰአት በላይ 99) መልስ የለም 88) አለውቅም	AQ5

41	የጤና ተቋሙ ባለሞያ ስለ ክትባት ምክር ተሰቶታል?	1) አዎ2) አልሰጠም....(**ወደ ጥያቄ 43 ይዟዱ**)	AQ6
42	ለጥያቄ 41 መልሱ አዎ ከሆነ በምን አከባቢ ላይ የጠነጠነ ምክር ነበር	1) የክትባትጠቀሜታ2) ክትባትንበሰአቱና በቀጠሮው ቀን ስለማስከተብጠቀሜታው 3) ክትባትን ሙሉ በሙሉ በየትኛው እድሜ እንደሚጨረስ 4) የሚቀጥለውቀጠሮመቼ5) ስለ አዳዲስ ክትባቶች 6) ሌላ _____99) መልስ የለም 88) አለውቅም	AQ7
43	የአገኙትን አገልግሎት እርካታ እንዴት ይገልጹታል ?	1) ጥሩ 2) መካከለኛ 3) መጥፎ 99) መልስ የለም 88) አለውቅም	AQ8
44	ለህፃኑ የክትባት አገልግሎት ጠይቀው ተከልክለው ያውቃሉ?	1. አዎ 2. አለውቅም.....(**ወደ ጥያቄ 46 ይዟዱ**)	AQ9
45	ለጥያቄ 44 መልሱ አዎ ከሆን ምክንያቱ ምን ነበር?	1) ህፃኑ ስለ ታመመ ባለሞያዎቹ ከልክለው 2) የክትባት ግባአት እጥረት ስለ ነበር 3)የክትባት መሰጫ ቀን አልነበረም 4) ክትባት የሚሰጠው ሰው አለነበረም5) የክትባት ካርድ የክትባት መስጫ ጊዜ ስላልያዝን 6) ክትባት በማይሰጥበት ጊዜ ስለሄድን 7) የክትባት መሰጫ ውስን ስለሆንና	AQ10

		ሰአት ስላለፍ8) ሌላ 99) መልስ የለም 88) አለውቅም	
ክፍል አራት: - የህፃኑ የክትባት ሁኔታ			
ተ.ቁ	ጥያቄ	መልስ	ኮድ
46	ህፃኑ ክትባት ወስዶ ያውቃል?	1) አዎ 2) አለወሰደም	CV1
47	ለጥያቄ 46 መልሱ አዎ ከሆን የክትባት ካርዱ አለዎት?	1) አዎ 2) የለም	CV2
48	ከካርዱ ላይ በሰንጠረዥ ውስጥ ያሉ መረጃዎችን ይገለብጡ? (ካርድ ከሌለ ከጤና ተቋም መዝገብ ላይ የተገኘ መረጃም ይሞላል)		CV3

የክትባት አይነት	ጊዜውን የጠበቀ ክትባት ወስዷል?	የህጻኑ የተከተበበት ቀን	
BCG	1)አዎ 2)አልወሰደም	/ /	
OPV0	1)አዎ 2)አልወሰደም	/ /	
OPV1	1)አዎ 2)አልወሰደም	/ /	
OPV2	1)አዎ 2)አልወሰደም	/ /	
OPV3	1)አዎ 2)አልወሰደም	/ /	
Penta 1	1)አዎ 2)አልወሰደም	/ /	
Penta 2	1)አዎ 2)አልወሰደም	/ /	
Penta 3	1)አዎ 2)አልወሰደም	/ /	
Measles	1)አዎ 2)አልወሰደም	/ /	
PCV 1	1)አዎ 2)አልወሰደም	/ /	
PCV 2	1)አዎ 2)አልወሰደም	/ /	
PCV3	1)አዎ 2)አልወሰደም	/ /	
Rota 1	1)አዎ 2)አልወሰደም	/ /	

		Rota 2	1)አዎ 2)አልወሰደም	/ /
49	ከካረዱ ላይ ከተመዘገቡ የክትባትቀን ቀጠሮዎችን ይመዝግቡ	1ኛ_____ 2ኛ_____ 3ኛ_____ 4ኛ _____ 99) የቀጠሮ ቀን አልተሞላም	1) ትክክለኛ ቀጠሮ ተመዝግቧል 2) ትክክለኛ ቀጠሮ አልተመዘገበም	CV4
50	ከላይ በካርዱ ላይ ባገኘነው መሰረት ጊዜውን የጠበቀ ክትባት ህጻኑ አግኝቷል ወይ	1) አዎ አግኝቷል 2)አላገኘም		CV5

የመረጃ ሰብሰቢው የሚሞላ

የመረጃ ሰብሰቢው ስም----------

የክልስተር ኮድ----------

ፊርማ----------

ቀን----------

በተቆጣጣሪ የሚሞላ

የተቆጣጠሪ ስም----------

የመጠይቁ ሁኔታ ተሟልቷል ☐ አልተሟላም ☐

ያልተሟላበት ክፍል/ቦታ.....

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DECLARATION

I, the under signed, declared that this thesis is my original work, and has not been presented for a degree in any other university and that all source of material used for this thesis and all people and institution that gave support for this have been duly acknowledge.

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Signature: _____.

Place: Addis Ababa

Date of submission: May 30, 2016

This Thesis work has been submitted with my approval as University Advisor.

Advisor's Name Signature

Prof. Alemayehu Worku _____.