
**ADDIS ABABA UNIVERSITY**
**COLLEGE OF HEALTH SCIENCE**
**SCHOOL OF PUBLIC HEALTH**

# Assessment of Vaccination Status And Associated Factors Among 6-23 Months Street Children In Addis Ababa, Ethiopia

**BY: Lia Haile (BSc)**

**ADVISOR: Mitike Molla (PhD)**

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**ADDIS ABABA UNIVERSITY**

Submitted by:

_____ _____ _____

Name of student Signature Date

Approved by:

1._____ _____ _____

Name of Main Advisor Signature Date

2._____ _____ _____

Name of Chairman, DGC Signature Date

3._____ _____ _____

Name of Dean, SGS Signature Date

## Declaration

I, Lia Haile, hereby declare that the thesis entitled "**Assessment of Immunization Practice and Its Associated Factors among 6-23 months Street Children in Addis Ababa, Ethiopia**" is my original work. I have carried out the present study independently with the guidance and support of the research advisor, Mitike Molla (phD). Any other contributors or sources used for the study have been dully acknowledged. Moreover, this study has not been submitted for the award of any Degree or Diploma Program in this or any other institution.

| | Signature | Date |
|---|---|---|
| Lia Haile | _____ | _____ |

## ACKNOWLEDGEMENTS

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**ABBREVIATIONS**

| | |
|---|---|
| AAU | Addis Ababa University |
| ANC | Antenatal Care |
| BCG | Bacillus Calmette Guerin vaccine. |
| CDC | Communicable Disease Control |
| DPT | Diphtheria and Tetanus Toxoid with Pertussis containing vaccine |
| EDHS | Ethiopian Demographic & Health Survey |
| EPI | Expanded Program of Immunization |
| GAVI | Global Alliance for Vaccines and Immunizations |
| Hep B | Hepatitis B |
| HiB | Hemophilus Influenza type B |
| HSDP IV | Health Sector Development Program IV |
| IRB | Institutional Review Committee |
| IMD | Invasive Meningococcal Disease |
| LMIC | Low & Middle Income Count |
| MDG4 | Millennium Development Goal 4 |
| MOH | Ministry Of Health |
| PCV | Pneumococcal Conjugate Vaccine |
| PNC | Post Natal Care |
| REC | Research and Ethics Committee |
| RED | Reaching Every District |
| SRS | Simple Random Sampling |
| SNNPR | Southern Nations, Nationalities, and Peoples' Region |
| SPH | School of Public Health |
| TT | Tetanus Toxoid |
| UNAIDS | United Nations Programme on HIV/AIDS |
| UNICEF | United Nations International Children's Emergency Fund |
| WHO | World Health Organization |

## ABSTRACT

**Background:** Vaccination is one of the most cost-effective interventions to prevent major illnesses that contribute to child mortality in the country, particularly in environments where malnourished children, overcrowding, poverty and illiteracy region (2).despite the fact that the vaccination service is free in Ethiopia, the vaccination coverage is very low among the lower economic class. However, there are limited studies among children born from vulenrable population especially among street women. Therefore, this study aimed finding out & describing the vaccination status of street children in the Ethiopian context. The survey result will serve as worthy data as a baseline.

**Objectives:** To assess vaccination status and its associated factors among 6-23 months age children born from women at the street and currently living at the streets of Addis Ababa, Ethiopia.

**Method:** A community-based cross sectional study was conducted from August 2019 to September 2019 in three Sub cites; Addis ketema, Kirkos & Arada which was selected from Addis Ababa by using simple random sampling method and the total 392 study participants were selected from each sub city by using proportionated to number of children and simple random sampling method. Data were entered cleaned and analyzed using SPSS version 22.

**Result:** A review of the vaccination cards and maternal recall children indicated that 38.04% of 6-23 months old street children living around Addis Ababa in the selected Sub cities were fully vaccinated. 95.7% were ever vaccinated, 65.2% vaccinated for age & 4.3% unvaccinated. From the total, BCG is in general the most taken by the majority of children (95.7%) followed by polio1 (94.4%) penta 1 (92.1%), measles was the least taken vaccine type which was 44.96%. The coverage showed a decrement from the first doses of vaccine to the last doses. Maternal age less than 20 year were more likely practicing child vaccination AOR= 0.6 (CI= 0.2, 0.8) compared to maternal age greater or equal to 31 years. Maternal literacy (AOR = 1.5(CI= 1.05, 2.4), daily income (AOR = 1.9(CI = 1.13, 4.6) were found to be factors significantly associated with full immunization in the logistic regression analysis.

**Conclusion:** There is low immunization coverage among children aged 6-23 months in the study Sub cities. Age of mother & knowledge of mother & institutional delivery is significant predictor of child vaccination status. The Addis Ababa health bureau, Sub cities, woredas and Health centers especially live around street children concentrated areas should work to raise awareness of street living community on vaccination and vaccine preventable diseases.



**Keywords:** Immunization practice; street children; Addis Ababa; Ethiopia

# 1. INTRODUCTION

## 1.1 Background

Vaccination is one of the most cost-effective interventions to prevent major illnesses that contribute to child mortality in the country, particularly in environments where malnourished children, overcrowding, poverty and illiteracy region (2).Immunization enabled the eradication of smallpox, lowered the global incidence of polio by more than 99% neonatal tetanus by 94%, and achieved dramatic reductions in illness, disability and death from measles, diphtheria, pertussis, hepatitis B, rotavirus, yellow fever and invasive bacterial causes of pneumonia and meningitis (3). Around 70 percent of the global decline in under-five deaths since 2000 can be traced to the prevention and treatment of infectious diseases. Vaccination programs resulted in a 79 percent drop in measles deaths between 2000 and 2014, preventing the deaths of an estimated 17.1 million children (4).

The Ethiopian Expanded Program on Immunization (EPI) was launched in 1980, with six antigens namely BCG, Diphtheria, pertussis, tetanus, polio and measles to reduce infant and child mortality and also other childhood vaccines given protect against Hepatitis B and Haemophilus influenza type B vaccines were introduced to the routine immunization program in 2007.

The government of Ethiopia introduced the pneumococcal conjugate vaccine (PCV 13) and monovalent human rotavirus vaccine (RV1) into the national's infant immunization program in November 2011 and October 2012, respectively. The pneumococcal vaccine protects against *Streptococcus pneumonia* bacteria, which cause severe pneumonia, meningitis, and other illnesses (5). The Ethiopia immunization programme considers a child to be fully vaccinated if the child has received all basic vaccinations, three doses of the pneumococcal conjugate vaccine (PCV vaccine) (also given at age 6, 10, and 14 weeks), and two doses of the rotavirus vaccine (given at age 6 and 10 weeks).

EDHS 2016 shows a little difference in the vaccination coverage rates between male and female children. However, full vaccination coverage is much higher in urban than rural areas (65 percent versus 35 percent). Full vaccination coverage is highest in Addis Ababa (89 percent) and lowest in Afar (15 percent) (5). Immunization service provision has shown gradual increase since 2004 reaching 86% administrative coverage of penta 3 in 2010 and 2011. Despite this gain, there was decline in 2012 and 2013 to 83 and 82 respectively and with increasing once gain to 87% in 2014(42).

## 1.2 Statement of the problem

Immunization saves 2 to 3 million lives each year. By protecting children against serious diseases, vaccines play a central role in ending preventable child deaths. UNICEF's immunization programme helps identify children who have been left behind by health systems, and brings them life-saving care (50). In Southeast Asia, mortality rates of pneumonia and preterm births decreased on average by3.6% (UR 2.6–5.2%) and 2.1% (UR 1.1–3.1%) annually in this period. In Africa, the pneumonia-specific mortality rate decreased at an annual rate of 2.0% (UR 1.3–2.6%) in 2000–10. At the country level, vary in trends in cause-specific death rates were seen in2000–10(4). Even though national immunization coverage rates have generally increased in many African countries, inequities persist among different communities. These are often driven by differences in ethnicity, income, place of residence, lifestyle, maternal education, or gender (51).

Vaccines now protect more children than ever before, however in 2015, an estimated 5.9 million children died before reaching age 5, mostly as a result of diseases that can be readily and affordably prevented and treated globally. UNICEF declared that unless rapid scale-up of available interventions (accelerated progress) occurs, by 2030: Almost 70 million children may die before reaching their fifth birthdays - 3.6 million in 2030 alone, the deadline year for the Sustainable Development Goals. Children in sub-Saharan Africa will be 10 times more likely to die before their fifth birthdays than children in high-income countries (6).

In 2019, 13.5 million infants did not receive any vaccines. Low immunization levels among poor and marginalized children compromise gains made in all other areas of maternal and child health. Over 1.5 million people die annually from diseases that can be prevented by vaccination (52).

Ethiopia is among the countries adversely experiencing repeated epidemics and outbreaks of vaccine-preventable diseases, despite strong government-led efforts to combat this. A large proportion of vulnerable infants and children in Ethiopia are facing vaccine-preventable deaths, especially in communities that are hard-to-reach, poor, and sparsely populated areas. The deaths are mainly due to diarrheal diseases (18%) and pneumonia (18%) (43).In the most recent coverage survey conducted in 2012; significant regional disparities were observed (pastoral areas of Somali, Afar, Gambella are persistently low as compared to Addis Ababa or Tigray) (42).

## 1.3 Significance of the study

Street children are an everyday sight in almost all urban centers of the world, but in developing countries, the issue attains greater gravity based on the limited support these children get and the scarcity of resources (7).

When the community makes plans, it does not take into consideration the street children difficulty. Though there are several studies conducted in Ethiopia regarding the vaccination status of under five year children there is no study conducted regarding immunization status of street children hence the magnitude of the problem is not investigated in Ethiopia.

This study sought to determine the vaccination status of street children in the three sub cities of Addis Ababa by collecting information on vaccination status and factors associated with vaccination coverage.

The resulting information will be used to answer questions related to vaccination coverage of street children, reasons for non/delayed vaccination, and factors associated with vaccination uptake in street children community.

The results will also provide baseline data for other research studies on vaccination status of street children. The findings from this study will be useful to the Sub cities health offices and health centers around the areas with the hope that it may facilitate the planning and implementation of effective interventions to improve the life of street children.

# 2. LITERATURE REVIEW

## 2.1 Global immunization coverage

Globally, vaccination saves lives of under-five children and in developing countries it has a paramount benefit. In the twentieth century, the administration of highly effective vaccines has been one of the most important medical developments and control common childhood infectious diseases (11). Every year, 10.6 million children die before the age of five years; 1.4 million of these have been due to vaccine preventable diseases (12).

In 2015, 5.9 million children under age five and every day 16000 died. The risk of dying before completing five years of age is still highest,(81 per 1000 live births; Comparing to the WHO European Region it is about 7 times higher, 11 per 1000 live births. Many countries, particularly those in WHO African Region still have very high under-five mortality. They are home to 6 of the 7 countries with an under-five mortality rate above 100 deaths per 1000 births. In addition, inequities in child mortality between high-income and low-income countries remain large. In 2015, the under-five mortality rate in low-income countries was 76 deaths per 1000 live births – about 11 times the average rate in high-income countries (7 deaths per 1000 live births) (4).

## 2.2 Vaccination coverage of children in Ethiopia

The 2016 EDHS Data show that 39 percent of children aged 12-23 months have received all basic vaccinations. Sixteen percent of children in this age group have not received any vaccinations. Sixty-nine percent of children have received the BCG, 73 percent the first dose of pentavalent, 81 percent the first dose of polio, 67 percent the first dose of the pneumococcal vaccine, and 64 percent the first dose of rotavirus vaccine. Fifty-four percent of children have received a measles vaccination. Coverage rates decline for subsequent doses, with 53 percent of children receiving the recommended three doses of the pentavalent, 56 percent the three doses of polio, 49 percent the three doses of the pneumococcal vaccine, and 56 percent the two doses of the rotavirus vaccine(5).

The previous immunization comprehensive multiyear plan covered the period from 2011-2015 and the two main priority areas indicated in the document were improving routine immunization coverage and introduction of PCV and Rotavirus vaccine into the national

immunization Program DPT3-HepB-Hib3 coverage of 96 % was planned to be attained by 2015 and the actual coverage for 2014 was 87%(41).

As EDHS 2016 report vaccination coverage increases with mother's education; about 3 in 10 (31 percent) of children whose mothers have no education are fully vaccinated compared with more than 7 in 10(72%) of children whose mothers have more than a secondary education. Similar patterns are observed by household wealth (5).

Full immunization coverage was heterogeneous among Ethiopian administrative regions, ranging from 8.8% in Afar region to 86.8% in Addis Ababa. Full immunization coverage among rural dwellers was 31.7 and 66.6% in urban areas. The overall full immunization coverage was 38.3% (95% CI: 36.7 41.2) according to the Ethiopian EPI schedule. Vaccine specific coverage for Pentavalent 3, OPV3, PCV3, Rota 2, and Measles were 56.1, 60.4, 51.9, 58, and 57.8%, respectively (49).

## 2.3 Factors influencing vaccination of children

Different factors determine a child's complete vaccination status, depending on whether the child lives in an area with a low or high routine EPI coverage. Socioeconomic and demographic factors, maternal characteristics, child characteristics, knowledge of age begins, finishes, Session needed for immunization, knowledge of mothers on vaccination and vaccine preventable diseases, availability and accessibility of vaccination service, Antenatal care (ANC) follow up and TT status of mothers, factors associated with missed opportunities and Perception of mothers may influence complete immunization status of children (15).

### 2.3.1 Socio-demographic factors

Many surveys show that Socio-demographic characteristics of mother/caretakers are determinant for vaccination status of children.

Evidence seen from the national demographic and health survey in 2011;There was a 40 % [AOR 95 % CI;1.4 (1.06-1.94)] more likely in receiving full vaccination among children born to mothers of rich wealth index group compared with children from women of poor wealth index group. Women from Afar [AOR 95 % CI; 0.07 (0.01-0.68)], Amhara [AOR 95 % CI;0.33 (0.13-0.81)], Oromiya [AOR 95 % CI; 0.15 (0.06-0.37)], Somali [AOR 95 % CI; 0.15 (0.04-0.55)] and Southern Nation and Nationalities People

[AOR 95 %CI; 0.35 (0.14-0.87)] administrative regions were less likely to fully vaccinate their children compared to women who reside in Addis Ababa(5).

Study done in Hosanna Town, South Ethiopia For bivariate analysis (COR) Educational status, occupation, age of mothers, religion, and family income of the mother showed significant association with the immunization status of the children. Experiences of child death also make mothers to vaccinate their children even if not have enough understanding about use of vaccination (11).

The study in Jigjiga district shows in the multiple logistic regression analysis, maternal age and literacy, place of residence, TT vaccine status, place of delivery and household visit by health workers were found to be the most important predictors of completing immunization (according to the vaccination cards plus mothers/care givers response) $p < 0.05$) (21).

Study done in rural Nigerian children shows Governmental employees was also more likely to fully vaccinate their children than house wife. But daily laborers were less likely to fully immunize their children than house wife. Here we can easily see knowledge difference between Governmental employees and the two. Only monthly family income was found to be predictor of defaulting from completion of child immunization in this study lower household income were more likely to have children with incomplete immunization status than parents reporting higher household income (14).

Other study done in Enugu Urban southeast Nigeria shows, the very poor, poor, and least poor socioeconomic levels significantly had a higher rate of full immunization than the poorest socioeconomic level for children aged under 5 years odds ratio [OR]1.934,95% confidence interval CI 1.513–2.820)(44).

### 2.3.2 Availability of Maternal and child health services

ANC follow up and tetanus toxoid status of mother is factors association with completion of child immunization. A study done in Hosaena 2015 in bivariate analysis ANC follow up and mothers TT vaccination status including place of delivery showed a significant association with completion of vaccination among children aged between 12-23 months. Mothers /care-taker Attending Antenatal Care at health facility gave birth to child at

health institution and vaccinated TT were more likely to fully immunize children than mothers not doing so(11).

Evidence from the national demographic and health survey in 2011 showed mothers who received postnatal check-up within 2 months after birth from health facilities were 1.8 times [AOR 95 % CI; 1.8 (1.28-2.56)] more likely to receive full vaccination than those who did not check after delivery(15). Among household-level determinants, the presence of a professional birth attendant was the most influential factor in a child's immunization status. Children whose births were assisted by a professional birth attendant were 1.5 times more likely to receive complete immunization than children whose births were not assisted by a professional birth attendant (OR = 1.49, 95% CI: 1.43–1.56) (19).

In Jigjiga, study revealed that mother's/caregivers' TT immunization acceptance was found to be the most important predictor for full immunization of children. Mothers/caregivers who took any TT vaccine during pregnancy were 2.43 times more likely to fully vaccinate their children than mothers/ caregivers who took none (AOR = 2.43, 95% CI = 1.56, 3.77) (21).

Other study done among street children in Sidama showed that those mothers who gave birth at home were 70.8% less likely to vaccinate their child than those who gave birth at a health facility (P = 0.029, AOR = 0.292, 95% CI: 0.097–0.879).However, ANC follow-up during pregnancy was insignificant in multivariable logistic regression analysis(54).

### 2.3.3 Availability and accessibility of vaccination service

Study done in Hosanna Town, South Ethiopia 2015 Shows the associations of health care availability and accessibility with the completion of vaccination, and Exposure to media as source of EPI information were also seen by using bivariate analysis, but no association observed between them. Also no health facility provides vaccination service with those different walking time to reach the health facility were compared, the likely hood of the children to be fully vaccinated becomes decrease as the walking time to reach health facility increase. But no significant difference between those takes more than one hour and no vaccination service near to their locality (11).

The third model shows that increasing the number of village health posts by one per 1000 population improved the probability of children receiving Complete immunization by

60% (OR =1.61, 95%CI: 1.47–1.77). Increasing the number of hospitals also improved the probability of children receiving complete immunization (OR = 1.07, 95% CI: 1.02–1.13). Increasing the number of health workers (midwives and nurses) by one per1000 population increased the probability that children would receive complete immunization by 22% (OR =.22, 95% CI: 1.15–1.3) (19).

Study reported from street children in Sidama showed that except for a few (1.9%), the majority (98.1%) of the mothers know the nearest public health facility to their dwelling site A smaller number (3.8%) travel more than 30 minutes to reach the nearest public health facility, while 96.2% (101) travel less than or equal to 30 minutes to reach the nearest public health facility (20).

The study from Jigjiga district shows that full immunization was found to have a significant association with the outreach activities of the health institutions. The probability of a child to be fully vaccinated was higher when the health workers visited homes for vaccination (AOR = 1.92, 95% CI = 1.17, 3.16) (21).

### 2.3.4 Knowledge of mothers on vaccination and vaccine preventable diseases

Study in Sidama town among street children discovered, 31.8% (34) of them have poor knowledge about vaccination. Almost all (98.1%) mothers have heard about vaccination from various sources. From these, 88.6% (93) heard from health professionals and others from advertisements on the street (5.7%), radio (1.9%), television (1.0%), and other sources of information (2.9%) including friends and neighbors. Seventy-three (69.5%) of the mothers aware that vaccination is available at any public health facility and others (30.5%) are not. From those who have heard about vaccination, 93.3% (98) considered that vaccination is a free service at a public health facility. In addition, 102(95.3%) of street mothers in this study reported that vaccination can prevent disease and a few (4.7%) didn't believe vaccination prevents disease (20).

Similar study done peri-urban area of Kenya showed that maternal education was one of the factors that were significantly associated with immunization coverage. In Kaptembwo, the proportion of fully immunized children of mothers/guardians who had attained secondary school education and above was 81.6% which is higher than those who had attained primary school education (76.7%) and even those with no formal education 42.9% (17).

### 2.3.5 Child characteristics

According to EDHS2016 There is little difference in the vaccination coverage rates between male and female children, However, full vaccination coverage is much higher in urban than rural areas (65 percent versus 35 percent) (5).

Study done in Addis Ketema sub-city showed that association of child characteristics like sex of the child, place delivery and birth order of the child with completion of child is also a factor for completion of immunization. Male children were 1.64 times more likely to be vaccinated but, no significant difference between both sexes on completion of vaccination. But birth order of the child did not show significant association with the immunization status of children aged between 12-23 months (18).

Other study done in Addis Ketema sub-city showed that12–23 months old children living ≥2 h from vaccination site were significantly more likely to drop/fail in receiving vaccines as compared to children living < 15 min from vaccination. Children living ≥2 h away from the vaccination site were significantly more likely to drop/fail in receiving vaccines as compared to children living < 15min from the vaccination site (AOR = 2.46, CI = 5.01, 17.18)(45).

### 2.3.6 Factors associated with missed opportunities

Study done in Hosanna Town, South Ethiopia Most of mothers' complain about Vaccination time is inconvenient, Unaware of need to return for second and third doses, don't know time and place of vaccination, Absence of vaccinators, Vaccination card lost and Vaccination site is far away(11).

Evidence show in rural Nigerian children 2011 shows a number of factors associated missed opportunities for vaccination and its associated risk factors. Maternal reasons for missed opportunities included sickness (24.5%), social engagement (30.4%), traveling (14.6%), long distance Walking (11.5%) and complications from previous injections (19%). Parents' objection, disagreement or concern about immunization safety (38.8%), long distance walking (17.5%) and long waiting time at health facilities (15.2%) are the most common reasons for incomplete vaccination/ immunization (14).

Also study done in peri-urban area of Kenya shows the reason for not taking children for immunization include; unawareness that the child was due for another vaccine, loss of

immunization card, child was ill, migration of parents upcountry, service charge and shortage of vaccines at the health facilities(17).

Study done in Sudan shows that walking time to the nearest place of vaccination strongly influenced the correct vaccination status of the children. 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 (34).

Other study done in Wadera District, South East Ethiopia revealed that the factor that the distance of home to area for vaccination service. Children of mothers who walked less than 30 min to reach to the facilities were four times [AOR= 4.1(1.2-13.2)] times likely to be fully vaccinated than children of mothers who have to walk 30 min or long (46).

## 2.4 Reasons for vaccination failure among partially or unvaccinated children

Study done in Jigjiga showed that, the main reasons given by mothers/caregivers why their children were not fully vaccinated were lack of information, lack of motivation, and obstacles to immunization(21).

Also study done in Ambo wereda respondents answer for the reason not completing and not vaccinated their children was; inconvenient vaccination time, do not know whether to come back for subsequent doses, vaccination is site is far away from them and the last given reason was lack of awareness about vaccination(12). Other study done in Addis ketema sub city Addis Ababa said forgetting the appointment date, changing place of residence, illnesses of children, postponing immunization and poor welcoming of health workers) and lack of awareness on the importance of vaccination(18).

## 2.5 Conceptual frame work

The conceptual fame work describes factors contributing to immunization practice and highlights the interrelationship between the variables considered in this study. This study considers immunization practice as outcome variable and the socioeconomic factors such as Age of the mother, Religion, Family income…that affect outcome variable through proximate determinants namely; maternal factors, environmental factors and health service factors are considered as independent variable.

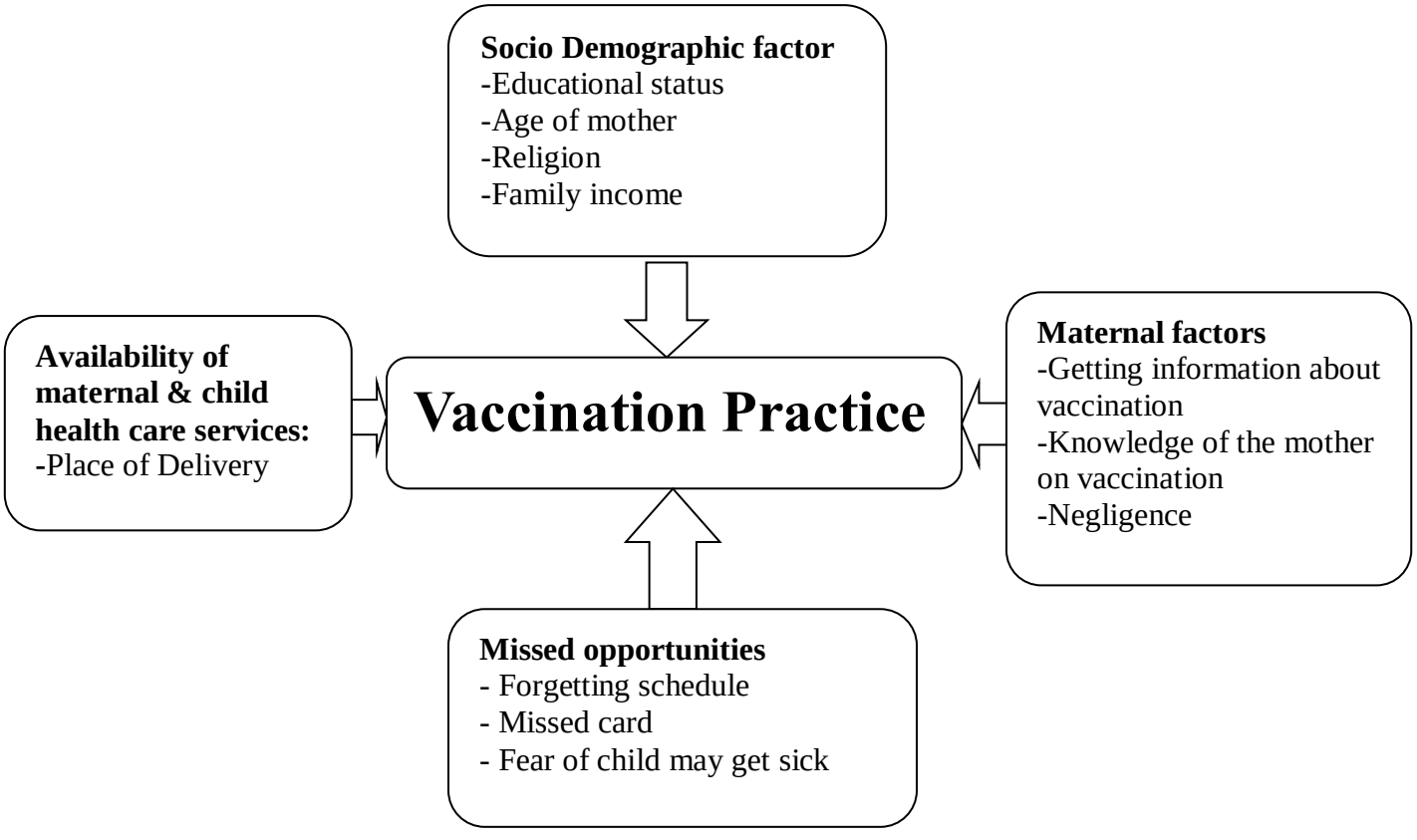


Figure 1: Conceptual frame work adapted from mosley and chen 1984 classical frame work

# 3. OBJECTIVES

## 3.1 General objective

- ✓ To assess vaccination status of children aged 6-23 months and factors associated with vaccination status in Addis Ababa, Ethiopia.

## 3.2 Specific objectives

- ✓ To assess prevalence of vaccination status among street children whose age 6-23 months.
- ✓ To identify factors associated with vaccination status of street children in Addis Ababa Ethiopia.

# 4. METHODS

## 4. 1 Study area & period

The study was conducted in selected sub cities of Addis Ababa, Ethiopia. In Addis Ababa there were 10sub cities and 116 woredas.

Addis Ababa is the capital and largest city of Ethiopia & also the place of Africa Union so can say the capital city of Africa. Addis Ababa's built-up urban area spans 183 square miles (474 square kilometers) with an estimated population 3.5 million people in 2015.As a charter city, Addis Ababa has the status of a city-state. The metropolitan area for Addis Ababa contains rural terrain, extending over approximately 203 square miles (527 square kilometers). While credible statistics are sparse, projections put the metropolitan area's population at approximately five million people (28).

The Ethiopian government estimates that there are currently 50,000 to 60,000 children living on the streets of Addis Ababa & estimates that about 25 percent of Addis Ababa's street children are females who are subject to violence and many turn to prostitution as a coping mechanism. Females who work and live on the streets are faced with extremely harsh conditions including lack of food and shelter, unwanted pregnancy, early motherhood, and sexual exploitation (30). This study was conducted in Addis Ababa, Ethiopia.

## 4.2 Study design

A community-based cross sectional study design was conducted from August 2019 to September 2019. Quantitative data was collected from mothers who had children aged 6-23 months to assess the vaccination status and factors affecting vaccination in Addis Ababa, Ethiopia. Three Sub cities were picked by using simple random sampling method from a list of 10 sub cities street children distribution in each sub city used by ministry of women and children unpublished 2010 annual report. Proportionated to number of street living mothers from the three sub cities, Arada Sub city 140, Addis Ketema S/city 102 & Kirkos Sub city 150. Final 392 study participants selected by simple random sampling method until sample size complete.

One child aged 6-23 months whose mother gave consent to participate in the study was selected. In cases where a mother did not have a child within the set criteria, she was skipped and not considered part of the sample. In cases where a mothers had more than

one child (tweens) aged 6-23 months, one was randomly selected so as to reduce bias of homogeneity if children from the same mother were picked. The mothers of the children were then interviewed. Information on vaccination status of the child was collected from vaccination cards provided by the mother and verbally by recall from the mother if vaccination card was not available.

## 4.3 Population

### 4.3.1 Source population

All 6-23 months children mothers both on the street and of the street residing in selected sub cities of Addis Ababa, Ethiopia.

### 4.3.2 Study population

All children aged 6-23 months of age living in the selected sub-Cities of Addis Ababa, Ethiopia.

### 4.3.3 Study Participants

Street living mothers who had children of 6-23months age

## 4.4 Sample Size determination

The required sample size was determined using single population proportion formula by considering proportion (p) as 50% since no previous study was conducted on vaccination status of under-five street children in Ethiopia, and a margin error of 5%,

Accordingly, the sample size was determined by the following formula;

$$n = \frac{(Za/_2)^2\ p\ (1-p)}{W^2}$$

Where, n= sample size

$(Z_{a/2})$= confidence level; taking 95%level of confidence interval,

P=50%, q = 1-p=50%  w= margin of error tolerated (0.05)

Based on the above assumption.

$$n = \frac{(1.96)^2 x 0.5\ (1-0.5)}{(0.05)^2}$$

n= 384

But as studies showed out of 60,000 street children live in Addis Ababa 25% of them are female that means they will be 15,000 (30). When I divide them to selected sub cities and the total population of under-five street children will be less than 10, 000 so that the population correction formula was used

nf= ni/1+ni/N

nf= 384/1+384/5000

356 +10% non-response rate

Total sample size will be 392 samples

## 4.5 Sampling Technique

Addis Ababa city administration has had street children in all sub cities and their distribution differs by number from sub-city to sub city. So that depending on their number of street children three cities were selected by proportionated to number of study participants. Ministry of women and children 2010 unpublished annual report and other study done on Homeless Street Females in Addis Ababa, Ethiopia (30) showed street living mothers were 25% of 60,000 of general number of street children in Addis Ababa. Due to that three sub cities were selected proportionated by their distribution 140, 102 and 150 samples were collected from Arada, Addis Ketema and Kirkos sub cities respectively. This list of 5000 Street living children served as the sampling frame. The first child was picked by simple random sampling method until sample size complete.

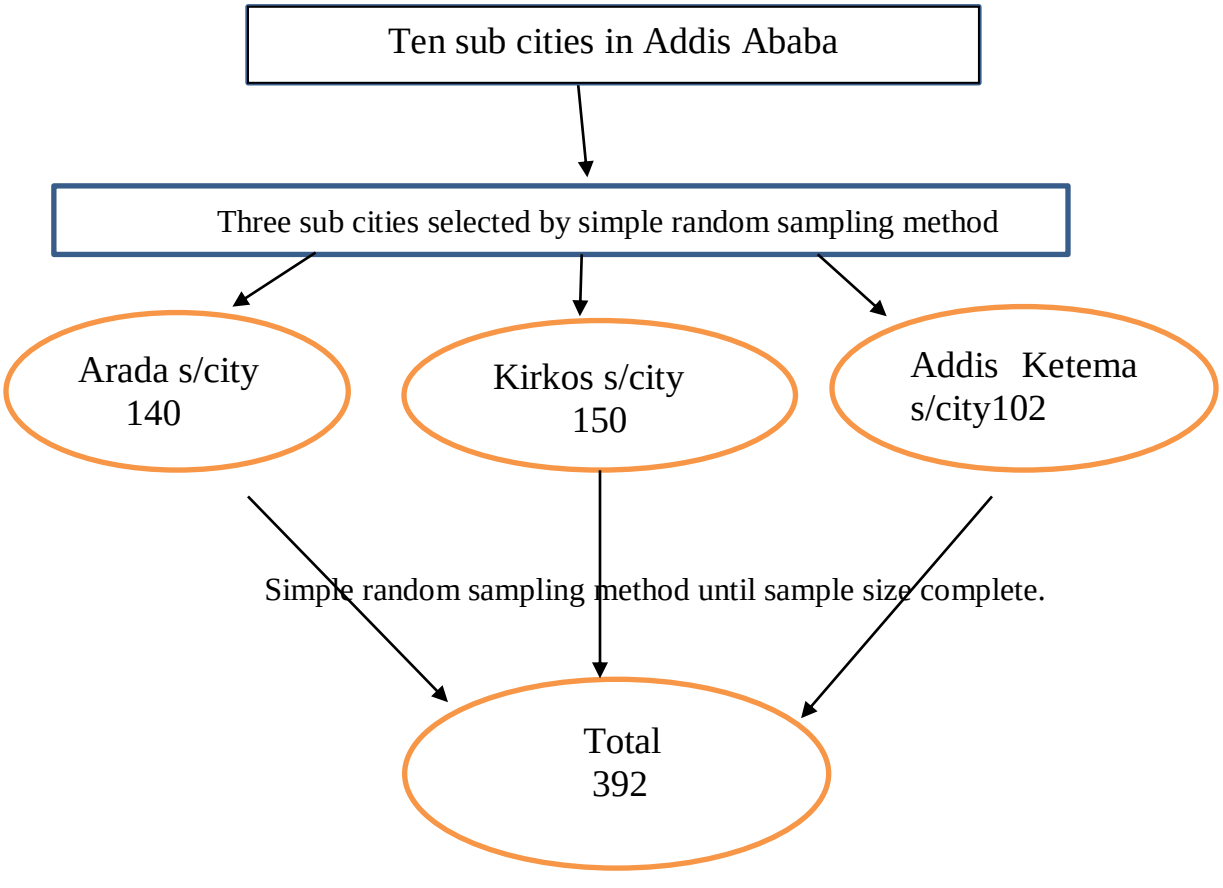


Figure 2:- Sampling technique frame work

## 4.6 Inclusion and Exclusion criteria

### 4.6.1 Inclusion criteria

All street mothers who have 6-23months children and live at Addis Ababa street more than six months were included in the study.

### 4.6.2 Exclusion criteria

All mothers who live at street of Addis Ababa and who have hearing problem and who cannot agree to participate were excluded from the study.

## 4.7 Data collection procedures

Quantitative data were collected from mother of children aged 6-23 months old using an interviewer administered structured questionnaire. The questionnaire was originally prepared in English then translated in to Amharic and back to English to make the information easily understood by the data collectors and interviewees during interview and to gate consistence information.

Information was collected on vaccination coverage in two ways: Mothers were asked to show the child vaccination card if they have one and the dates of immunization were copied on to the questionnaire. If they do not have the card with them, they were asked to bring it from health facilities by giving a specific appointment data. Mothers who are willing they bring the card by the next day of appointment. For those mothers who had no vaccination card and who could not bring their card from health facilities but they claimed that their children was vaccinated, appropriate questions were asked in order to determine the vaccination status of the child for each specific vaccine. Mother's history reminder as site of administration (whether it is taken as injection or orally, presence of scar and also at what age they vaccinate) was included instruments. In case of pentavalent & polio vaccine the mothers are asked to report the number of pentavalent & polio vaccines that the child had received.

Twelve high school completed data collectors who have experience on data collection and two health officers for supervision were recruited. Two days training and orientation was given on the objectives of the study and the techniques of data collection for two days. The collected data was checked for completeness and corrective measures were taken accordingly. The collected data was cleaned coded and explored before analysis. The principal investigator was coordinated the overall activity of the study.

## 4.8 Study Variables

### 4.8.1 Dependent variable

- ✓ Vaccination status of street children aged 6-23 months

### 4.8.2 Independent variables

- ✓ Socio-demographic factors (age of mother, religion, residence, marital status, occupation, level of education, monthly income).
- ✓ Health- system factors (distance, transportation, transport cost, availability health facilities and health professionals)
- ✓ Source of information (health facilities, mass media, printed papers, others)
- ✓ Knowledge of mothers/caretakers
- ✓ Residence
- ✓ Place of delivery
- ✓ Family income

## 4.9 Operational definitions

- ✓ **Street children**, street children as "…those who are being materially and morally abandoned or neglected or who are exploited or who upon their choice for better chance of survival have joined the street life"(MOLSA, 1989).
- ✓ **Children "On" the street**-These are children who depends on the street for their subsistence, but usually return home at night
- ✓ **Children "of" the street**- these are children who work and sleep on the street, where by street is their principal home.
- ✓ **Fully immunization** -Infants who received one dose of BCG, three doses of each of OPV, DPT, and Hepatitis B vaccines, PCV 2doses Rota virus and one dose of measles vaccine and before reaching one year of age.
- ✓ **Partially immunized** - A12-23 months old child who received at least one vaccine, but not all the EPI vaccines.
- ✓ **Unimmunized**- A12-23months old child who did not receive any of the vaccines.
- ✓ **Immunization coverage by card** -The vaccination coverage calculated with numerator based only on card documentation, excluding from the numerator those vaccinated by history.
- ✓ **Immunization coverage by history** -The vaccination coverage calculated with numerator based only on mother's/caregivers report.

### 4.10 Data quality assurance

The instrument was constructed from the review of available literature on immunization coverage, WHO questionnaires, EDHS for immunization coverage and translated into local language. Every day filled questionnaires were checked in the field for completeness by both data collectors and supervisors before they return from field. Every questionnaire was checked by principal investigator every day after data collection before data entry.

### 4.11 Data processing and analysis

The collected data was entered to SPSS version 22 after cheking completeness,then cleaned and analyzed accordingly. Errors related to inconsistency were verified using cross tabulation and other the data were exported to Statistical Package for Social Sciences (SPSS) version 22. Then categorized and sorted for further analysis.

Descriptive analysis was used to describe socio-demographic characteristics of respondents and other relevant variables in the study. The results are presented in text, tables and graphs as based on the types of data. Furthermore, logistic regression, specifically bivariate analyses was done to see the crude relationship between independent variables and the outcome of interest and multivariate analysis was used to control for confounding effects of other variables and determines independent predictors of vaccination.

The crude and adjusted odds ratios together with their corresponding 95% confidence intervals were computed. Significant of the study will be determined using a P-value < 0.05 was considered in this study.

### 4.12 Ethical consideration

Ethical clearance was obtained from the research and ethics committee (REC) of the School of Public Health AAU. Official letters was written by School of Public Health, to Addis Ababa Health Bureau, Women's, children & youth affairs and Labor & social affairs. Study participants were briefly informed about the objective and the significance of the study and finally their written consent was obtained. The respondents were told that they could withdraw from the study at any time they wanted. Confidentiality of the data was maintained throughout the study period and the names of the study participants were omitted from the questionnaires. For the mothers they lost their children vaccination card the researcher helped them to get a copy from the health facility where their child

was vaccinated. Health education related to vaccination service was also given to the whole street mothers immediately after data collection.

### 4.13 Dissemination of results

The finding of the study would primarily be presented to the school of Public Health as partial fulfillment of the degree of public health. Following that it would further be submitted to selected sub cities, Addis Ababa Health Bureau and responsible persons. The findings also disseminated to different organizations that would have contributions to improve the vaccination status of children.

# 5. RESULTS

A total of 392 children of aged between 6-23months were included in this study.

## 5.1 Socio demographic characteristic of study participants

A total of 392 mothers of 6-23months children were interviewed at street & institutions of three street children concentrated sub cities. All respondents were mothers of 6-23 month children. Different characteristics of study participants were observed. The majority of mothers 245 of them were 21-30 years old. In this study only 76 (19.4%) were married & living together. Most 231(58.9%) of them were illiterate (unable to read & write). Two hundred twenty four (57.1%) of them were living by begging. More than half of them are on the street children.

The religion of mothers; Orthodox 312 (79.6%), followed by Muslim 51 (13.1%). The educational status of mothers stated major as illiterate (unable to read and write) 231 (58.9%), read and write 40 (10.2%), 1-8 grade 108 (27.6%).

Job of mothers for income generation indicated as begging 221 (56.4%), followed by daily labor 94(24%). Average daily income of the mothers between 50-99 ETB 188 (48.0%), followed by less than or equal to 49 ETB is 118 (30.1%), (Table 1).

Table 1: Socio demographic characteristics of study participants in Addis Ababa, Ethiopia 2019 (N= 392)

| Variables | Frequency(n) | Percent % |
|---|---|---|
| **Age of respondents** | | |
| ≤20 | 88 | 22.4 |
| 21-30 | 245 | 62.5 |
| >31 | 59 | 15.1 |
| **Age of children** | | |
| 6- 9 months | 69 | 17.6 |
| 10-24 month | 213 | 54.3 |
| 25-59 months | 110 | 28.1 |
| **Birth place of respondents** | | |
| Amhara | 153 | 39 |
| Oromo | 108 | 27.6 |
| Tigray | 21 | 5.4 |
| Welayta | 53 | 13.5 |
| Others | 57 | 14.5 |
| **Marital Status** | | |
| Married | 65 | 16.6 |
| Never Married | 180 | 45.9 |
| Living together | 11 | 2.8 |
| Divorced | 136 | 34.7 |
| **Religion** | | |
| Orthodox | 312 | 79.6 |
| Protestant | 29 | 7.4 |
| Muslim | 51 | 13.1 |
| **Educational Status** | | |
| Illiterate | 231 | 58.9 |
| Read and write | 40 | 10.2 |
| 1-8 | 108 | 27.6 |
| 9-12 | 13 | 3.3 |
| **Occupation** | | |
| Only begging | 224 | 57.1 |
| Daily laborer | 96 | 24.5 |
| Jeblo | 25 | 6.4 |
| Small business | 47 | 12 |
| Others | 9 | 2.3 |
| **Average daily income** | | |
| ≤49 Birr | 118 | 30.1 |
| 50-99 Birr | 188 | 48.0 |
| ≥100 Birr | 86 | 21.9 |
| **Categorized living place** | | |
| On the street | 212 | 54 |
| Of the street | 180 | 45.9 |

## 5.2 Information heard about child vaccination & Source of Information

Information of mothers on the vaccination and source of information was another factor assessed in this study. From the total respondents about 371(94.6%) heard about vaccination and vaccine preventable disease, of these 79.8% heard from health professionals, 11% from friends and 3.8% from other peoples.

The place of getting this information 317 (80.9%) was at health center, 42 (10.7%) from place they live (at street) from other places like charity places, churches…12 (3%). (Table 2).

**Table 2:** Mothers response for information & Source of Information about child vaccination in Addis Ababa Ethiopia August 2019

| Variables | Frequency (n) | Percent (%) |
|---|---|---|
| **Ever heard about vaccination** | | |
| Yes | 371 | 94.6 |
| No | 21 | 5.0 |
| **Source of information(n=371)** | | |
| Friends | 43 | 11 |
| Health professionals | 313 | 79.8 |
| Others | 15 | 3.8 |
| **Place of getting information** | | |
| Health center | 317 | 80.9 |
| From the place I live (At street) | 42 | 10.7 |
| Other (Charity places, churches…) | 12 | 3.0 |

## 5.3 Characteristics of the child

A total of 392 children of aged 6-23months were included. Majority children 96.5% were born at health institution, while 2.7% of them at home. In addition, majority the children were ever took one or more doses of vaccine, out of these only 19.1% of them had vaccination card during the study.

Table 3:- Characteristics of the study 6-23months children in Addis Ababa, August 2019

| Variable | Frequency | Percent |
|---|---|---|
| **Number of under five children** | | |
| One | 378 | 96.5 |
| Two | 14 | 3.6 |
| **Place of Delivery** | | |
| Home | 10 | 2.7 |
| Health institution | 365 | 97.3 |
| **Ever vaccinated** | | |
| Yes | 375 | 95.7 |
| No | 17 | 4.3 |
| **Had vaccination card** | | |
| Yes | 316 | 80.6 |
| No | 76 | 19.4 |

## 5.4 Vaccination status among 6-12months children by card plus maternal recall

From total of 392 children aged 6-12 months selected and included in this study, 132(38.04%) of children had completed their entire serious of vaccination on the day of survey. About 95.7 % of children were ever taken one or more does of vaccines. 198(50.5%) children were partially vaccinated and 17(4.3%) were unvaccinated. Out of vaccinated, 19.1% mothers showed a vaccination card.

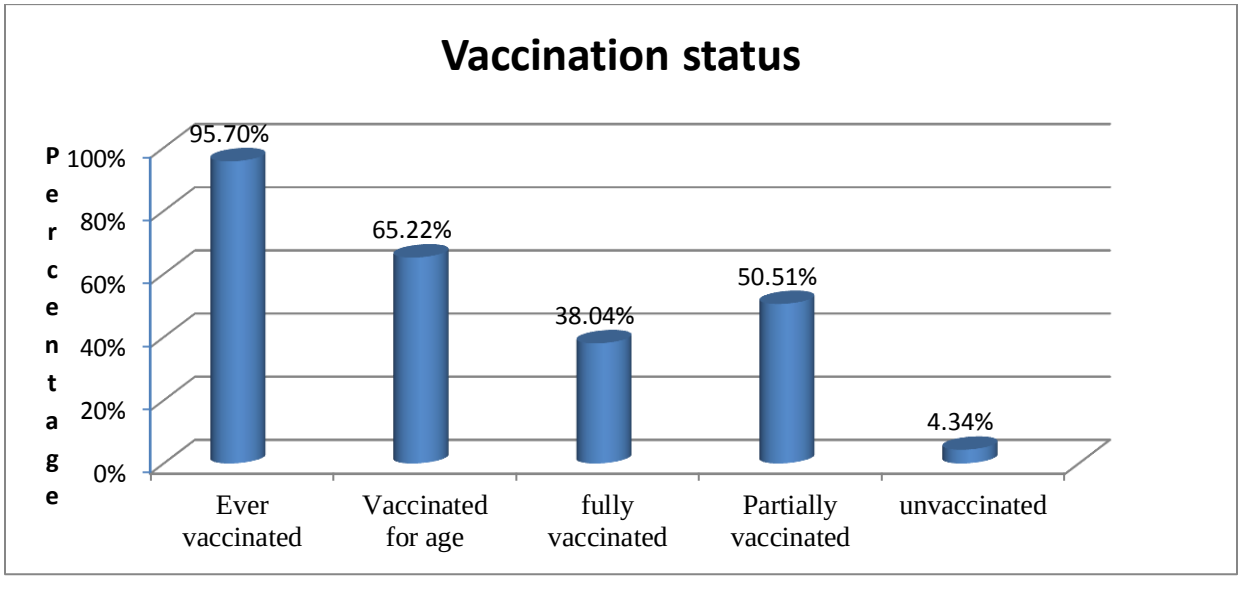


Figure 3: Vaccination status of 6-23 months old street children in Addis Ababa August 2019

## 5.5 Vaccination Coverage by card plus maternal recall

By combining the evidence of cards and parents recall vaccination coverage from the total of 392(6-23months old children), 95.66% took BCG vaccine followed by OPV1 95.4% and penta1 (92.35%) then the least 48.30 was took Measles. (Figure 4)

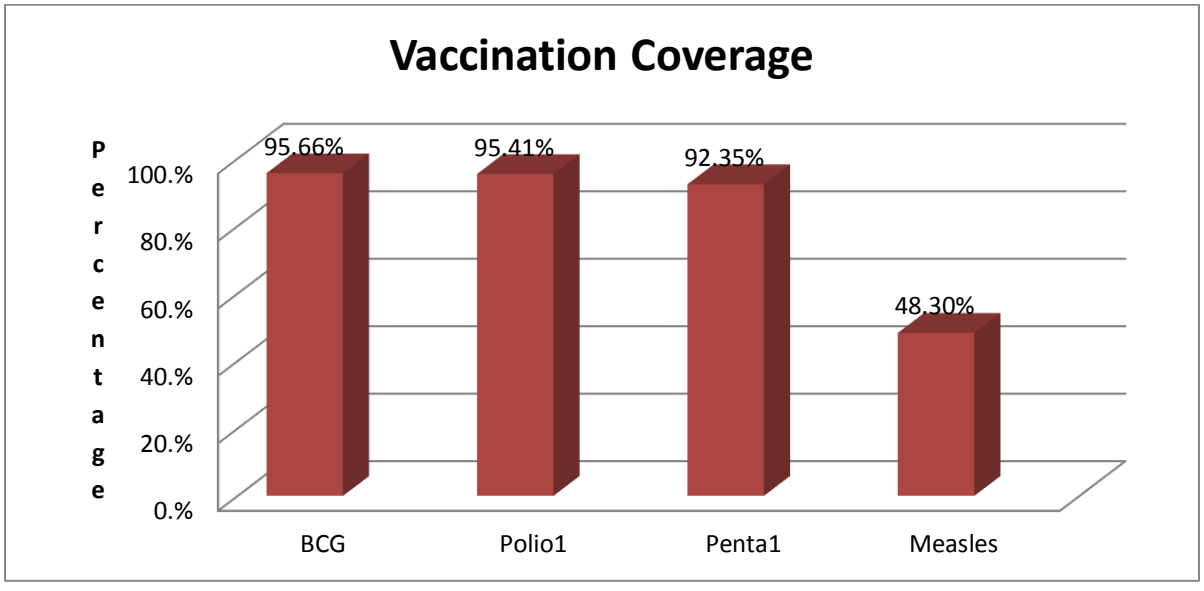


Figure-4:-Vaccination coverage of 6-12 months children based on the vaccination card and history, Addis Ababa, August, 2019

## 5.6 Factors affecting vaccination status of children

Findings from bivariate analysis indicated that older mothers were less likely to vaccinate their children than the younger counterparts [AOR and (95% CI)= [0.6 (0.2, 0.8)]. Maternal literacy [AOR and (95% CI)= 1.5(CI= 1.05, 2.4)], daily income [AOR and (95% CI)1.9(CI = 1.13, 4.6)] were found to be factors significantly associated with full immunization in the multivariate logistic regression analysis.

Average daily income and place of residence (being “on” and “of’ the street) were also assessed variables that have no association with completion of immunization in this study.

Association of mothers’ knowledge about vaccination with the completion of vaccination was the other factor assessed in this study. The results from bivariate analysis shows, in mothers who were educated greater than or equal to 9-12 grade had [AOR and (95% CI)1.5(CI= 1.05, 2.4)] times more experience of children vaccination compared with mothers of children who were illiterate. This indicated that mothers who increase level of education they practice vaccination of their children properly.

Table 4: Completion of vaccination and factors associated with practice among 6-23 months street children by socio demographic characteristics in Addis Ababa, Ethiopia, 2019

| Variables | FULLY VACCINATED (Vaccinated for age) | | COR (95%CI) | AOR (95%CI) |
|---|---|---|---|---|
| | Yes | No | | |
| **Age of Mother** | | | | |
| ≤ 20 | 27 | 61 | 1 | 1 |
| 21-30 | 111 | 134 | 0.6(0.3, 1.2) | 0.6(0.3, 1.1) |
| ≥31 | 25 | 34 | **0.5(0.3, 0.9)** | **0.6(0.2, 0.8)** |
| **Age of children in month** | | | | |
| ≤ 9 month | 0 | 69 | **4.7(2.6, 8.5)** | **4.6(2.5, 8.3)** |
| 10-24 month | 85 | 128 | 1.3(0.8,2.1) | 1.3 (0.8, 2.1) |
| ≤ 25 months | 44 | 66 | **1.0** | 1.0 |
| **Marital status** | | | | |
| Married | 33 | 32 | **1.8(1.1, 3.3)** | 0.9(0.5, 1.7) |
| Never married | 65 | 115 | 0.4(0.1, 1.6) | 1.5(0.9, 2.4) |
| Living together | 8 | 3 | 1.4(0.7, 2.6) | 0.2(0.05, 1.1) |
| Divorced | 57 | 79 | 1 | 1 |
| **Educational status** | | | | |
| Illiterate | 84 | 147 | 1 | 1 |
| Read and write | 16 | 24 | 1.5(0.7, 8.0) | 1.1(0.6, 2.2) |
| 1-8 grade | 55 | 53 | 2.4(0.6, 8.7) | 0.7(0.3, 2.0) |
| 9-12 grade | 8 | 5 | **2.8(1.3, 8.9)** | **1.5(1.05, 2.4)** |
| **Living place** | | | | |
| Of Street | 47 | 124 | 1.0 | 1.0 |
| On Street | 82 | 139 | 1.5(1.01, 2.4) | 1.4(1.01, 2.02) |

## 5.7 Reasons for vaccination failure among partially vaccinated children

Among the reasons given for not completing their children vaccination, majority of the respondents 73(36.87%) indicated that they have forgotten their vaccination schedules, 65(32.8%) lack of awareness on the importance of vaccination 38 (19.19%) of them reported that they lost their children's vaccination card and afraid of poor welcoming of the health professionals, 22(11.1%) reported that they were afraid that their children may get sick (Figure-5).

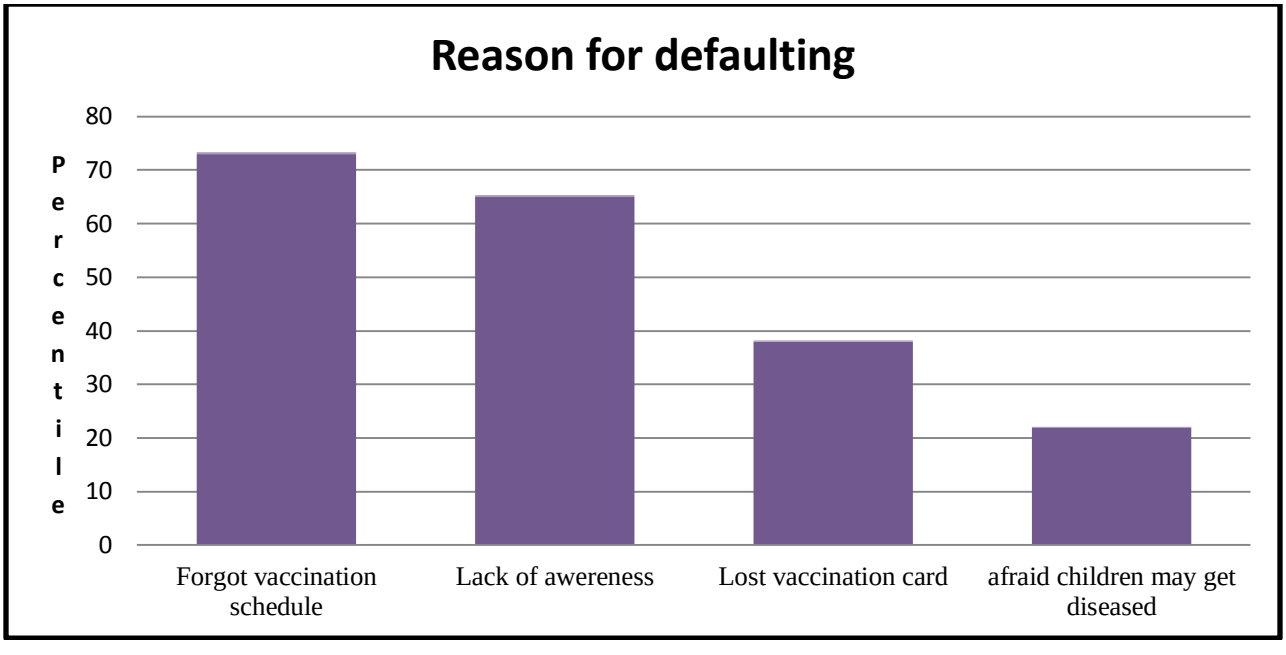


Figure 5:- Reasons given by mothers for defaulting from completing children's vaccination, in Addis Ababa, August, 2019

In addition to this, reasons for never vaccinate their children were also asked the respondents whose children were not vaccinated. Among the reason given 41.18% of the respondents have no information about vaccination, 29.41% believed that vaccination have no use for their children, 17.65% respond that they went to their family after deliver their children and the rest 11.76% of respondents said that they were sick after delivery. (Figure 4).

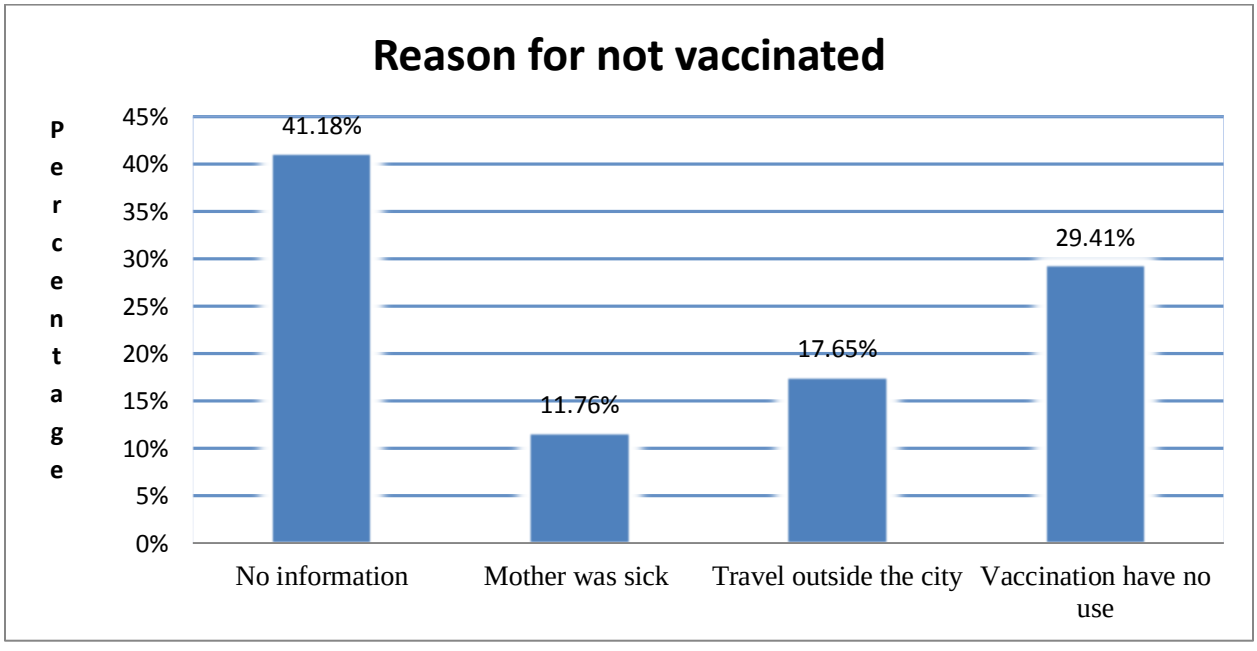


Figure 6:- Reasons given by mothers for not vaccinated their children in Addis Ababa, August, 2019

# 6. DISCUSSION

This study was conducted in a marginalized community to assess the vaccination status and factors associated with vaccination coverage of children aged between 6-12 months old residing in Addis Ketema, Arada & Kirkos sub-cities, Addis Ababa city government, Ethiopia.

The interviewed mothers were of the street & on the street mothers. They have almost the same economic status & the educational status vary from low or no educational status up to high school level. This study identified several reasons affecting childhood vaccination status. Of these, Age of the mothers and Educational status of the mothers were reasons for incomplete vaccination status of children.

Vaccination coverage was assessed using the availability of vaccination card and maternal recall. Based on vaccination card and recall, 38.04% children were fully vaccinated, 65.2 % were vaccinated for age and 4.3 % were not vaccinated. BCG vaccine coverage was slightly higher than the coverage of the Polio1 vaccine which is given each other according to the Expanded Program of Immunization schedule.

The BCG coverage was 95.66 % followed by OPV1 95.4% and Penta1 coverage was 92.3% and the least 48.3% took measles. The measles coverage is lower than all vaccinations coverage because of the time gap between the two vaccines, in which the mother can forgot the measles vaccine.

Even though all the study participants had access to immunization services routinely at health institutions, only 38.04% children were fully vaccinated was a little lower as compared to a survey conducted at nationwide in the country (EDHS, 2016) which is (39%). 65.2% were vaccinated for age and 17 (4.3%) were not vaccinated much more higher than (EDHS, 2016) which is 16% [5].

The BCG coverage is slightly higher followed by polio vaccine. The measles vaccine is lower than all vaccines because of dropout and the long time gap between the other vaccines in which the mothers forgot or may not return back to the measles vaccine.

The vaccination coverage found in our study is lower compared to other studies conducted among hard to reach population in Ethiopia and other neighboring African countries [32, 36, 41, 46, and 48].

This may be related to the fact that knowledge of mothers is better in the neighboring countries cited in this study such as Kenya [17].

On the other hand, though it is not among similar population some remote areas in Ethiopia (Jigjiga 36.6%, Oromia Regional State, Ambo wereda 35.3%, Easter Ethiopia 22.9%), and Mumbai Slum area 27% has documented less coverage than the street children population in Addis Ababa which is 38.04%. This may be despite the fact that our population is vulnerable access to health facilities is easy than the rural.

This study also tried to evaluate factors affecting the immunization status of the children by classifying the status of the children into two categories vaccinated or not and whether the child is fully vaccinated or vaccinated for age.

The present study found statistically significant association between maternal education and immunization uptake. Mothers whose educational level grade 9-12 had 1.5 times more likely to have fully vaccinated children compared to illiterate mothers. The result of this study is in agreement with a study conducted in some remote areas of Ethiopia and India slum areas [21, 32, 33, 53].

This might be due to the contribution of education, changes in attitudes, traditions and beliefs, increased decision-making which could directly enhance a health seeking behavior of the mothers.

Apart from maternal education, mothers' good knowledge of vaccination programs increased the odds of their children being vaccinated. However the result of this study does not agree with the study in slum areas of neighboring country Kenya (47). Age of mother is associated with the child vaccination practice in the preset study; children of older mothers had higher rates of correct immunization than had the children of younger mothers. This finding is consistence with the study done in some part of Ethiopia& slum areas in India [18, 21, 31, and 36].

From characteristics of the child, age and place delivery show an association child vaccination status. The current study revealed that children less than one year age are vaccinated higher than children whose age is greater than two years. This may be due to coverage rates decline for subsequent doses as age increases forgetting schedules also increases. Because they might not be concerned about their children vaccination appointment as they struggle to meet the daily demands for food and shelter. This result is in line to the study in Enugu Urban Southeast Nigeria & rural block, Muzaffarnagar

[44, 54], though there is no significant association for the study in Ambo and for the study in Mangalore [12, 36].

This study found that the delivery of child in a healthcare institution was having a descriptively significant association with the use of vaccination to the children aged between 6-23 months. This might be due to the fact that Place of delivery did have independent result on the children being vaccinated, since institutional deliveries may lead to administration of initial vaccine and the only way to get information about the use of vaccination with schedules. This finding is also in line to other studies conducted among hard to reach population in Ethiopia and other neighboring African countries [17, 21, and 32] but in contrast to the study done vaccination coverage among Indian children [31].

Marital status, of the mother was not seen to be associated with the completion of vaccination. The current study was in line with the study in Ambo west shewa, Addis ketema Sub city Addis Ababa [12, 18]. This study also tried to assess the association of vaccination practice with occupation and religion of the mother; however did not showed significant association with the vaccination status of the children unlike the study of Ambo west Showa[12].

In the present study, it was found that vaccination status was not associated with factors such as living place of mother and socio economic status.

The response of mothers for not vaccinated or defaulter was forgetting the appointment, lack of awareness, missed card was the major reasons and fear of child may get diseased was the commonest reasons for not vaccinated their children. These indicates a need for better counseling and follow up of street mothers about the importance of vaccination and all related issues.

Based on the mother's response and presentation of vaccination card the percentage of mothers who showed vaccination card was 19.1%, has card but not seen 61.5% and did not have card or missed card was 19.4%. The present study has lower finding as Compared to the study in slum settlements in an urban area in coastal Karanata, slum of Rewa, Dhaka, and Slum Kenya [39, 40, 47 and 53].

# 7. STRENGTH and LIMITATION

## 7.1 Strength

- The mothers of children who have the correct information on the child's immunization history were interviewed.
- Prepared on marginalized (neglected) group with no previous study conducted.
- Experienced & well trained 12 grade students were used as data collector under strong supervision of two health officers.

## 7.2 Limitations

This study offers important contributions to the literature, however there are important limitations that affect external validity, particularly generalizability:

- Vaccination coverage by report of mothers may under/over report the vaccination coverage because mothers may not remember doses that child took due to recall bias
- Attitude of the mothers was not studied, which may have an impact on immunization.
- Health facility from the health system perspectives not addressed
- Qualitative method was not included to answer why question

# 8. CONCLUSION AND RECOMMENDATION

## 8.1 Conclusion

There is low immunization coverage among children age 6-23 months in the street living population of Addis Ababa. In which 65.2% vaccinated for their age, only 38.04% were fully vaccinated and 17(4.3%) of the children are unvaccinated.

Almost all mothers deliver their children at health institution 365(97.3%). About 94.6% mothers heard about vaccination and vaccine preventable disease, of them 79.8% heard this information from health professionals and 80.9% heard this information from health institution.

Children are defaulted mostly by negligence (forgetting vaccination schedule), lack of awareness, lost vaccination card and afraid child may get diseased. Children are unvaccinated mostly because of no information, mothers not believe the use of vaccination, mother was sick and mother was sick after delivery.

## 8.2 Recommendation

The findings of this study clearly indicate the great importance for the vaccination status of street children. The level at which the number of street children has increased highlights the urgent need for the problem to be addressed by the government and the society.

Based on the findings of the survey, the following recommendations have been made.

- Health centers especially which are around the street children concentrated areas should plan their vaccination service by including street children; prepare special programs to reach them.
- The Woreda health office should work to raise the awareness by designing proper health education programs targeting the street living mothers on benefit of vaccination like outreach health education programs, defaulters tracing mechanism using urban health extension program workers by creating referral linkage with health facilities and vaccination services at their places.

- Appropriate vaccination time should be arranged for the mothers/caretakers, like street children and daily laborers, who do not have enough time during the working day after assessing the need
- Government should design Strategies how those marginalized groups be address.
- Inter-sectoral collaboration including NGO is needed to achieve better vaccination coverage.
- Non-governmental organization (NGOs) should play their role in assistance of this group as in some source of support health bureau to cover expenses for EPI service.
- Researchers should study this area help to show the gap and direction for ministry of health and policy makers.

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**Annex I: Information sheet, Consent form, Questionnaire (English Version)**

**I: <u>Information Sheet</u>**

Name of the area _____

Questionnaire identification no. _____

Address of the client: _____

Introduction: How are you? My name is _____. I am a data collector for the thesis conducted by a student at Addis Ababa University College of Health Sciences on Immunization practice and its associated factors among 6-23months old street children in Addis Ababa city.

I would like to inform you that you are chosen to be interviewed. Before we go to the interview, I will request you to listen carefully to what I am going to read to you about the purpose and general condition of the study and tell me whether you agree or disagree to participate in this study.

**II. <u>Consent Form</u>**

The purpose of this study is to improve immunization practice for children who made their living on street.

The study will be conducted through interviews. The interview will only take about 15-20 minutes of your time. At the end, it is hoped that the information you give us could help to improve the immunization practice of street living children. The interview involves private life questions. I would like to assure you that this privacy should strictly be kept confidential. A code number will identify every participant and no name will be used. The interview is voluntary and there will be some incentives for your lost time. You have the right to respond or not respond to the all or some questions. You can also stop the interview in between if you are not interested. Your participation or non-participation, or refusal to respond to the questions will have no effect now or in the future on services that you or any member of your family may receive from service providers.

Are you willing to participate in this study?

1. Yes 2. No

Thank you!!

If the study subject agrees to participate in the study, start the interview. Interviewer signature certifying that informed consent has been given verbally by the respondent.

Name _____ Signature _____Date _____

## I: Structured questionnaire English version

### PART 1: Socio demographic factors of the mother

| Code | **Questions** | **Categories** | **Skip** |
|---|---|---|---|
| 101 | How old are you? | _____ years | |
| 102 | Age of child in months | _____ Months | |
| 103 | Birth place/with specific woreda | 1.Amhara----------<br>2. Oromo ----------<br>3. Tigre----------<br>4. Welayta ----------<br>5.Other _____ | |
| 104 | Mothers marital status | 1. Married<br>2. Never Married<br>3. Living together<br>4. widowed<br>5. Divorced | |
| 105 | What is mother's religion | 1. Orthodox<br>2. Protestant<br>3. Muslim<br>4. Catholic<br>5. Other _____ | |
| 106 | Mothers educational status | 1. Do not read and write<br>2. Not attended school but I do read and write<br>3. Primary school (1-8 grades) | |

| | | | |
|---|---|---|---|
| | | 4. Secondary school (9-12)<br>5.Higher education (diploma and higher) | |
| 107 | What do you do for living?<br>(Occupation of mother?) | 1.Only begging<br>2. Student<br>3.Daily Laborer<br>4.Small business<br>5.Other ---------- | |
| 108 | Daily income of the mother? | ----------Birr | |
| 109 | Daily expense of mother? | ----------Birr | |
| 110 | Where do you live? | 1. At street<br>2.Small rented house<br>3.Plastic shelter<br>4.Paying daily for bed<br>5.Around Church/mosque<br>6.Others specify---------- | |
| 111 | What was mother's reason to live at street? | 1. Job search<br>2. Quarrel<br>3.parental divorce<br>4. Death of parents<br>5.peer pressure<br>6.Other ---------- | |

**Part II Questions related immunization history**

| | | | |
|---|---|---|---|
| 201 | How many <5 year children do you have? | 1. One<br>2. Two<br>3. Three | |
| 202 | From your <5 year children is there a child born before you live on street? | 1.Yes<br>2.No | |
| 203 | If the answer for the S.No 202 is Yes have they received any vaccinations? | 1. Yes<br>2. No | |
| 204 | If they didn't received Why? | 1. No information<br>2. Health facility is far<br>3. Fear that child may get disease<br>4.Child was ill<br>5. Other---------- | |
| 205 | Have you got any information about vaccination when you live on street? | 1. Yes<br>2. No | |
| 206 | If the answer is yes, from whom you got the information? | 1. Friends<br>2. Health professionals<br>3.Religion leaders<br>4. NGOs<br>5. Radio<br>6. Television<br>7. Other---------- | |
| 207 | From where you got the information? | 1. Health center<br>2. from the place I live<br>3. By going to charity place<br>4. Other---------- | |

| | | | |
|---|---|---|---|
| 208 | Where do you deliver your child? | 1 Home<br>2. Health facility<br>3.At street<br>4. Other | |
| 209 | Do your children that you deliver at the street receive any vaccinations? | 1. Yes<br>2. No<br>3. Don't know | |
| 210 | If your children didn't get any vaccination what is the reason? | 1.Forgetting<br>2.Fear of child get diseased<br>3. Card was missed<br>4.I thought that much not necessary<br>5. Other | |
| 211 | If your children get vaccinated do you have card? | 1Yes seen<br>2.Yes not seen<br>3.No card<br>4.Other | |
| 212 | Did you ever have a vaccination card for your child? | 1. Yes<br>2. Yes but with other person<br>3. No I miss it | |
| 213 | If the answer is Yes For the Question number 209 Has the child received vaccinations dose on time for his/her age? | 1. Dose was given on time for his/her age<br>2.Dose was given but not on time for his/her age<br>3.Dose was given but no date is recorded<br>4. Other | |
| 214 | Has the child received any vaccinations that are not recorded on this card, including vaccinations given in a national immunization day campaign? | 1. Yes<br>2 .No<br>3.Do not know | |
| 215 | A BCG vaccination against tuberculosis that is an injection in the right arm or shoulders that usually causes a scar? | 1.Yes<br>2.No<br>3.Dont know | |

| | | | |
|---|---|---|---|
| 216 | If yes for the question 215 May I see BCG scar please? | 1.Yes, seen<br>2. Not seen | |
| 217 | Polio vaccine, that is, drops in the mouth? | 1. Yes<br>2.No<br>3. Don't know | |
| 218 | Was the first polio vaccine given in the first two weeks after birth or later? | 1. First 2 weeks<br>2.Later | |
| 219 | How many times was the polio vaccine received? | Number of times…… | |
| 220 | A DPT or DPT-HepB-Hib vaccination, that is, an injection given in the thigh or buttocks | 1. Yes.<br>2. No.<br>3. Don't know. | |
| 221 | How many times was a DPT or DPT-HepB-Hib vaccination given? | Number of times-------- | |
| 222 | A measles injection - that is, a shot in arm at the age of 9 months or older. | 1.Yes<br>2.No<br>3.Don' know | |
| 223 | Did the child receive a vaccination certificate for completing schedule for all vaccinations? | 1.Yes<br>2.No<br>3.Don' know | |
| 224 | Within the last six months has the child received a vitamin dose? | 1.Yes<br>2.No<br>3.Don' know | |

## Annex II: Information sheet, Consent form, Questionnaire (Amharic Version)

### ማብራሪያ

የአካባቢ ስም----------

የመጠይቅ መለያ ቁጥር----------

ማስተዋወቂያ

ጤና ይስጥልኝ_____እባላለሁ፡፡

በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና ሳይንስ ተማሪ ስሆን በአዲስ አበባ ከተማ ኑሯቸውን በጎዳና ላይ ያደረጉ ከ6-23 ወር ህጻናት ያሏቸው ሴቶች በልጆቻቸው የክትባት ሁኔታ ላይ ጥናት መረጃ ሰብሳቢ ነኝ፡፡

እርስዎም የቃለ መጠይቅ ተሳታፊ ሲሆኑ ወደ ቃለ መጠይቁ ከመሄዳችን በፊት ከዚህ ቀጥሎ ስለ ጥናቱ አላማ እና ጠቅለል ያሉ መረጃዎችን የማነብልዎት ስለሆነ በጥሞና ካዳመጡ በኋላ ጥናቱ ላይ ለመሳተፍ ፈቃደኛ መሆን አለመሆንዎን ይገልፁልኛል፡፡

**<u>ፈቃደኛነትን መጠይቅ ቅፅ</u>**

የዚህ ጥናት አላማ በአዲስ አበባ ከተማ ውስጥ ኑሮአቸውን በጎዳና ላይ ባደረጉ እድሜያቸው ከ15 እስከ 49 የሆኑ ሴቶች ለሚወልዷቸው ልጆች የክትባት አገልግሎት ተደራሽነትን ማሻሻል ነው፡፡ ጥናቱ የሚሰበሰበው በቃለ መጠይቅ ሲሆን ቃለ መጠይቁ የሚወስደው ጊዜ ከ15 እስከ 20 ደቂቃ ይሆናል፡፡

እርስዎ የሚሰጡት መረጃ በጥናቱ የግል ህይወት ጥያቄዎችን ያካትታል፡፡ ይህ የሚሰጡት መረጃ በሚስጥር እንደሚጠበቅ ላረጋግጥልዎት እወዳለሁ፡፡ እያንዳንዱ ተሳታፊ በሚስጥር ቁጥር ይለያል ስም አይጠቀስም፡፡ ቃለ መጠይቁ በፈቃደኝነት ላይ የተመሰረተ ሲሆን ከእኛ ጋር ለሚያጠፉት ጊዜ ጥቂት ድንማ ይኖረዋል፡፡ ጥያቄዎቹን ሙሉ በሙሉም ሆነ በከፊል የመመለስ መብት አለዎት እንዲሁም ካልተመቸዎት በመሀል ቃለ መጠይቁን ማቆም ይችላሉ፡፡ የርስዎ ተሳትፎ ወይም ያለመሳተፍ ወይም ለመሳተፍ ያለመስማማትዎ አሁንም ሆነ ወደፊት እርስዎም ሆነ ቤተሰብዎ በሚያገኙት አገልግሎት ላይ የሚያመጣው ጉዳት አይኖርም፡፡

በጥናቱ ላይ ለመሳተፍ ፈቃደኛ ነዎት?

ሀ) አዎ ለ) አይደለሁም

አመሰግናለሁ

ተሳታፊዋ ለቃለመጠይቁ ፈቃደኝነታቸውን የሚያረጋግጥ የተጠያቂ ፊርማ

ስም_____ፊርማ_____ቀን

## መጠይቅ

### ክፍል-1 ለእናትየሚጠየቅማህበራዊእናዲሞግራፊያዊጥያቄዎች

መመሪያ፡የሚከተሉትንጥያቄዎችከጠየቁበኋላምርጫለቀረበላቸውጥያቄዎችመልሳቸውንያክብቡምርጫላቀረበላቸው ጥያቄዎችበተሰጠውክፍትቦታላይመልሱይፃፍ

| ተ.ቁ | ጥያቄዎች | አማራጭ | |
|---|---|---|---|
| 101 | እድሜሽስንትነው? | _____ አመት | |
| 102 | የትውልድ ቦታ ከወረዳና ቀበሌ ጋር? | 1.አማራ ---------- 4. ደቡብ----------<br>2.ኦሮምያ ---------- 5. አዲስአበባ----------<br>3.ትግራይ ---------- 6. ሌላ——— | |
| 103 | የትዳርሁኔታ | 1.ያገባች<br>2.አብራየምትኖር<br>3. ባሏ የሞተባት<br>4.አግብታምአብራኑራምአታውቅም<br>5. ሌላ---------- | |
| 104 | ሀይማኖትሽ ምንድነው? | 1. ኦርቶዶክስ 4. ካቶሊክ<br>2. ፕሮቴስታንት 5. ሌላ _____<br>3. ሙስሊም | |
| 105 | የትምህርት ደረጃሽ? | 1.ማንበብናመጻፍአልችልም<br>2.ትምህርትቤትገብታአልተማርኩምግንማንበብናመጻፍእች ላለሁ<br>3.የአንደኛደረጃትምህርት (1-8 ክፍል)<br>4.ሁለተኛደረጃትምህርት (9-12)<br>5.ከፍተኛደረጃትምህርት (ዲፕሎማእናከዛበላይ) | |
| 106 | ስራሽ (መተዳደሪያሽ ምንድነው)? | 1) ልመናብቻ<br>2) መማር<br>3) የቀንሰራተኛ (ተመላላሽሰራተኛ)<br>4) ጀብሎ<br>5) ጉልት (አነስተኛንግድ)<br>6) ሌላ---------- | |

| | | | |
|---|---|---|---|
| 107 | የቀን ገቢሽ ምን ያህል ነው?<br>[የኢትዮ.ብር] | ----------ብር | |
| 108 | የቀን ወጪሽምን ያህልነው?<br>[የኢትዮ.ብር] | ----------ብር | |
| 109 | የትነው የምትኖሪው? | 1) በመንገድ (በረንዳ)ላይ<br>2) ትንሽቤት ተከራይቼ<br>3) በፕላስቲክ የተሸፈነመጠለያውስጥ<br>4) ከቤተሰብጋር<br>5) ቤተክርስቲያንወይምመስጊድበርላይ<br>6) ሌላ---------- | |
| 110 | ወደጎዳና እንድትወጪ ያደረገሽ<br>ምክንያት ምንድነው ? | ነ) ስራፍለጋ<br>2) ተደፍሬ<br>3) አባትና እናቴ ስለተፋቱ<br>4) የሚረዳኝ የቤተሰብአባልበመሞታቸው<br>5) በጓደኞቼግፊት<br>6) ሌላ---------- | |

**ክፍል 2 የክትባት ታሪክን የተመለከቱ ጥያቄዎች**

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| 201 | ከአምስትአመትበታችስንትልጆችአሉሽ? | 1. አንድ<br>2. ሁለት 3. ሶስት | |
| 202 | ከ5አመትበታችከሆኑትልጆችሽየትውልድቦታሽእያለሽየተወለዱ<br>አሉ? | 1.አዎ<br>2. የሉም | |
| 203 | የተራ ቁጥር 202 መልስ አዎ ከሆነ ክትባት አስከትበሻል? | 1. አስከትቤአለሁ<br>2. አላስከተብኩም<br>3. ሌላ | |
| 204 | ካላስከተብሽ ለምን? | 1. መረጃ የለኝም<br>2. የጤና ተቋሙ ሩቅ ነበር<br>3. ልጄን ያመዋል ብየስለፈራሁ<br>4. ልጄን አሞት ስለነበር | |

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| | | 5. ሌላ---------- | |
| 205 | ጎዳና ከወጣሽ በኋላ ስለክትባት የምታገኝው መረጃ አለ? | 1. አለ<br>2. የለም | |
| 206 | የምታገኝው መረጃ ካለ መረጃውን የምታገኝው ከማን ነው? | 1. ከጓደኞቹ<br>2.ከጤናባለሙያ<br>3. ከሀይማኖትአባቶች<br>4. ከእርዳታድርጅች<br>5. ከራድዮ<br>6. ከቴሌቪዥን<br>7. ሌላ--------- | |
| 207 | የምታገኝው መረጃ ካለ የምታገኘው ከየት ነው? | ነ. ጤናጣብያ<br>2. ያለሁበትቦታሆኜ<br>3. ወደእርዳታድርጅትበመሄድ<br>4. ሌላ---------- | |
| 208 | ልጅሽን የት ወለድሽው? | ነ.ቤትውስጥ<br>2. ጤናተቋም<br>3. ጎዳና<br>4. ሌላ | |
| 209 | ጎዳና ከወጣሽ በኋላ የወለድሻቸው ልጆችሽ ተከትበው ያውቃሉ? | ነ. ተከትበውያውቃሉ<br>2. ተከትበውአያውቁም<br>3. አላውቅም | |
| 210 | ልጆችሽ ካልተከተቡ (ካቋረጡ) ምክንያቱ ምንድነው? | ነ.እየረሳሁት<br>2. ልጇይታመማልብየስለምፈራ<br>3. ካርድስለጠፋብኝ<br>4. ያንያህልአስፈላጊመስሎስላልታየኝ<br>5. ሌላ | |
| 211 | ልጆችሽ ከተከተቡ የክትባት የቀጠሮ ቀን የተጻፈበት የክትባት መከታተያ ካርድ ካለ ልታሳይኝ ትችያለሽ? | ነ. አለይታያል<br>2. አለግንአይታይም<br>3. ካርድየለም<br>4. ሌላ | |
| 212 | የልጅሽ የክትባት ካርድ ሁል ጊዜ ካንቺ ጋር አለ? | ነ.አዎን<br>2. ኣለ ግን ከሌላ ሰው ጋር ነው<br>3. ጠፍቶብኛል | |

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| 213 | የጥያቄቁ. 209 መልስ አዎን ከሆነ ልጅሽ ያገኘው ክትባት ወቅቱን የጠበቀ ነው? | ነ.ለእድሜው ተገቢውን ክትባት ወስዷል<br>2.ክትባቱን ወስዷል ግን ወቅቱን የጠበቀ አይደለም<br>3.ክትባቱን አግኝቷል ግን የወሰደበት ቀን አልተመዘገበም<br>4. ሌላ | |
| 214 | አገር አቀፍ የክትባት ዘመቻን ጨምሮ ህጻኑ ያገኘው ክትባት ካርድ ላይ ያልተመዘገበ አለ? | ነ.አለ<br>2.የለም<br>3.አላውቅም | |
| 215 | ቢሲጂ የቲቢ በሽታን ለመከላከል በቀኝ እጅ የሚሰጥና በብዛት ቁስል የሚፈጥር ክትባት ተከትቧል? | ነ.ተከትቧል<br>2. አልተከተበም<br>3.አላውቅም | |
| 216 | ልጁ/ልጅቷ ከተከተበ/በች የቢሲጂ ጠባሳ ልታሳይኝ ትችያለሽ? | ነ. አለይታያል<br>2. አይታይም | |
| 217 | ፖልዮ ክትባት በአፍ የሚሰጥ ጠብታ | ነ. ተከትቧል<br>2. አልተከተበም<br>3.አላውቅም | |
| 218 | የመጀመሪያው የፖልዮ ክትባት የተሰጠው መቼ ነው? | ነ. የመጀመሪያው ሁለት ሳምንት<br>2.ከሁለት ሳምንትበኋላ | |
| 219 | የፖልዮ ክትባት ስንት ጊዜ አገኘ? | በቁጥር----- | |
| 220 | ዲፒቲ፣ሄፕቢ፣ሄ.ኢ.ቢ ክትባት በታፋ/መቀመጫ ላይ የሚወጋ አንዳንዴ ከፖልዮ ጠብታ ጋር የሚሰጥ? | ነ.ተከትቧል<br>2. አልተከተበም<br>3.አላውቅም | |
| 221 | ህጻኑ ዲፒቲ/ዲፒቲ፣ሄፕቢ፣ሄ.ኢ.ቢ ምን ያህል ጊዜ ተከተበ? | በቁጥር-------- | |
| 222 | የኩፍኝ በሽታን ለመከላከል በ9 ወር እና ከዛ በላይ ላለ ህጻን በክንድ የሚሰጥ ክትባት? | ነ.ተከትቧል<br>2. አልተከተበም<br>3.አላውቅም | |
| 223 | ህጻኑ/ኗ ክትባት ያጠናቀቀበት ሰርተፍኬት ተሰጥቷል? | ነ.አዎን<br>2. አልተሰጠውም<br>3. አላውቅም | |
| 224 | ህጻኑ/ኗ ባለፉት 6 ወራት የቫየታሚን ጠብታ ተሰጥቶታል? | ነ.አዎን<br>2. አልተሰጠውም<br>3.አላውቅም | |