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Prevallence And Associated Factors With The Uptake Of Measles Second Dose Vaccine Among Children Aged 24-35 Months In Assosa Zone, Benishangul Gumuz Region, Ethiopia, 2024

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BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF BIOSTATISTICS AND EPIDEMIOLOGY

PREVALLENCE AND ASSOCIATED FACTORS WITH THE UPTAKE OF MEASLES SECOND DOSE VACCINE AMONG CHILDREN AGED 24- 35 MONTHS IN ASSOSA ZONE, BENISHANGUL GUMUZ REGION, ETHIOPIA, 2024

By; ESKEDAR YOSEF (BSC)

A THESIS SUBMITTED TO THE DEPARTMENT OF EPIDEMIOLOGY AND BIOSTATISTICS, SCHOOL OF PUBLIC HEALTH, COLLEGE OF MEDICINE and Health Sciences, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN FIELD EPIDEMIOLOGY

JUNE, 2025

BAHIR DAR, ETHIOPIA

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June ,2025

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DECLARATION

This is to certify that the thesis entitled "FACTORS ASSOCIATED UPTAKE OF SECOND DOSE MEASLES VACCINE AMONG CHILDREN AGED 24- 35 MONTHS IN WESTERN ASSOSA ZONE, BENISHANGUL GUMUZ REGION, ETHIOPIA, 2024" submitted to partial fulfilment of requirements for the Masters of Public Health in Field Epidemiology, Department of epidemiology and biostatics, school of public health, college of medicine and health sciences, Bahir Dar University, is prepared solely by myself. It has not been submitted, in whole or in part, in any previous application for a master's degree the work presented is entirely is my own.

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Approval of thesis

I herewith certify that I have supervised, read, and evaluated this thesis titled "PREVALLENCE AND ASSOCIATED FACTORS WITH THE UPTAKE OF MEASLES SECOND DOSE VACCINE AMONG CHILDREN AGED 24- 35 MONTHS IN ASSOSA ZONE, BENISHANGUL GUMUZ REGION, ETHIOPIA, 2024"

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I herewith certify that I have examined this thesis report entitled "PREVALLENCE AND ASSOCIATED FACTORS WITH THE UPTAKE OF MEASLES SECOND DOSE VACCINE AMONG CHILDREN AGED 24- 35 MONTHS IN ASSOSA ZONE, BENISHANGUL GUMUZ REGION, ETHIOPIA, 2024" by Eskedar Yosef. We recommend and approve the thesis report for a degree of "Master of Public Health in Field Epidemiology"

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Acronyms/ Abbreviations

AFRO	African Regional Office of WHO
ANC	Ante Natal Care
BCG	Bacillus Chalmette Guerin
BG	Benishangul Gumuz
CDC	Center for Disease Control and Prevention
DOR	Dropout Rate
DPT	Diphtheria-Pertussis-Tetanus vaccine
DHIS2	District Health information system2
EDHS	Ethiopian Demographic and Health Survey
EFY	Ethiopian Fiscal Year
EPI	Expanded Program of Immunization
PHEM	Public Health Emergency Management
IDPs	Internally displaced people
IRB	Institutional Review Board
IPV	Inactivated Polio Vaccine
IA	Immunization Agenda
MCV1	Measles Containing Vaccine first dose
MCV2	Measles Containing Vaccine Second Dose
MMWR	Morbidity and Mortality Weekly Report
OPV	Oral Polio Vaccine
PCV	Polysaccharide Conjugated Vaccine
PNC	Postnatal Care
SIAs	Supplementary Immunization Activities
SPSS	Statistical Package for Social Science
SDG	Sustainable Development Goals’
TT	Tetanus Toxoid
TBA	Traditional birth attendance
UNICE	United Nations Children’s Fund
WHO	World Health Organization
HWDA	Health women development army

Abstract

Introduction: Measles is a highly contagious, vaccine-preventable disease caused by the measles virus, which is part of the Paramyxoviridae family. Annually, over 136,000 people die and 15,000 – 60,000 blindness cases are reported due to measles globally, especially in Africa and Asia. The disease continues to be a global public health concern. Because there are so many unvaccinated children, particularly in Benishangul Gumuz Regional State, there is very poor administrative coverage of the second dose of the measles vaccination. The aim of this study was to asses uptake of second dose measles vaccine and its associated factor among children's age 24-35 month In Assosa zone Benishangul Gumuz, Ethiopia.

Methods: A community-based cross-sectional study design was conducted from October 1 to November 30, 2024, with a response rate of 98.4% of the total participants. To choose a district, we employed multistage sampling. Data was gathered using an interviewer-administered, structured, and pretested questionnaire. The Statistical Package for Social Science (SPSS) Version 27 was used for analysis once the data was exported from Epi-data 4.7. Binary logistic regression analysis was performed using both bivariate and multivariable methods. The model's fitness was evaluated using Hosmer-Lemeshow goodness of fit statistics.

Result: The respondents were 842 enrolled with a response rate of 98.4%, in this study with measle second dose coverage 33.7% (95% CI: 30.4, 37.0). Place of delivery [AOR=; 1.75 95% CI (1.216, 2.517)], Availability of immunization card [AOR=1.4301; 95%CI(1.034, 1.977)] Mom/ caregivers of children with workload[AOR= 0.27; 95% CI (0.169, 0.44)] fear of side effects to vaccinate[AOR= 7.76; 95%; CI (4.01,14,08)] vaccines given to children should be many [AOR=8.197;95% CI (4.867, 13.801)], and long waiting time for immunization services[AOR=4.438; 95% CI(2.986, 6.597)] were factors significantly associated with uptake of measle second dose.

Conclusion and recommendation: The findings of the study show that the measles second dose vaccine uptake in the current study area was too low compared to the WHO target. Place of delivery, Availability of immunization card, Workload of mother, Fear of Adverse Event following immunization, Vaccine to be many and long waiting time. Therefore, woreda health office should strength periodic monitoring and evaluate the implementation of second dose of measles vaccine. Health professions should also improve mothers' awareness on institutional delivery, and retain their immunization card in the zone.

Keywords: - Associated factors, MCV2 uptake, in Assosa zone, BG 2024

1. Introduction

1.1 Background information

Measles is a serious and extremely contagious disease caused by the Morbillivirus genus within the Paramyxoviridae family, which can be prevented by vaccination (1). Even with a safe and effective vaccine, it remains one of the world's leading causes of morbidity and mortality in children, and the virus is still prevalent in many nations because of a drop in measles vaccination rates (2, 3). The virus infects immunological cells, causing acute immune suppression(4).

The symptoms include fever, maculopapular rash, and one of three Cs: cough, runny nose, and conjunctivitis. It's complications can arise in almost all organ system encephalitis(Inflammation of brain tissue), croup, and pneumonia are frequently cause of death; and common cause of loss of sight in countries that are developing and complications rate are rise by immune deficiency disorders, malnutrition's, vitamin A deficiency, intense exposures to disease, and lack of previous measles vaccinations(5).It is primarily spread by aerosolized respiratory droplets from person to person(6).

Vaccination programs have been successful in reducing the burden of measles disease; consequently, the global immunization program began in 1974, and Ethiopia launched its program in 1980. Initially, the program includes six antigens; measles, Polio, diphtheria, pertussis and tetanus(DPT), and Bacilli Chalmette Guerin(BCG)(7). Almost 136,000 people died because of measles in 2022,(8) And 15,000 – 60,000 blindness cases globally(9) The majority of them were under five children, despite the widespread prevalence of large-scale immunization. (8, 10).

In 2011, the AFR member states set a regional strategy to attain 95% coverage with two doses of the measles-containing vaccine (MCV) at the national and district level through routine or supplemental immunization efforts (SIS) in order to eliminate measles by 2020. MCV2 coverage is an essential indicator for monitoring the Sustainable Development Goals' (SDGs) progress(11). 2021, upon review, the African region immunization strategy plan 2021-2030 seeks to eradicate measles in at least 80% of countries by 2030. (12).

Additionally, to enhance its defenses against the elimination of measles. Ethiopia launched the second dose of measles vaccine(MCV2) in 2019(13). However, studies indicate that different countries have various policies on introduction and coverage of the second dose of measles, with various combinations and methods of delivery (14) . This study investigates measles second dose vaccination uptake and relationship factors for measles in Assosa Zone, BG, which has had significant measles outbreaks over the past two years, including an outbreak that is still going on in

2023–2024. It is generally accepted that the level of measles immunity among people needed to maintain measles elimination(herd immunity threshold) is greater than 90%(15).

The World Health Organization (WHO) and United Nations International Children's Fund (UNICEF) jointly recommended routine immunization, including MCV1 at 9 Months and MCV2 at 15-18 months. 95% vaccination coverage for both the first and second doses of the measles vaccine is one of the goals in the strategy (16). According to the Morbidity and Mortality Weekly Reports, global MCV2 coverage is expected to be 74% by 2023 (17). There are still notable regional differences. By the end of 2021, 71% of children worldwide had received a second dose of the measles vaccine(18) in addition. The coverage of the second dose of measles in Africa has increased from 33% to 49% between 2019 and 2023(19).

In Ethiopia, MCV2 coverage in the Ethiopian Demographic and Health Survey (EDHIS) 2019 was reported to be 9.1% (20),46% in 2020, and 46% in 2021(20). Global priorities continue to include increasing vaccination awareness, enhancing measles control, and researching methods for measles disease elimination (21). The WHO has emphasized that consistent MCV2 coverage is crucial to Ethiopian's measles elimination(22). However, the uptake of the second dose of measles among children 24 to 35 months in the Assosa zone remains low (69).

It is crucial to determine and analyze the various variables that contribute to the low uptake of MCV2 in order to design effective measures that will increase vaccination rates and improve the general health outcomes of children in the zone. Since this immunization program was only recently implemented, limited is known about MCV2 and the factors that impact it, particularly in Benishangul Gumuz Region.(23) The purpose of this study is to evaluate the Uptake of MCV2 and factors associated with children in the Assosa Zone, Benishangul area, Ethiopia, who are between the ages of 24 and 35 months.

1.2 Statement of Problem:

Globally, a number of Measles cases increased by 18% and deaths increased by 43% in 2022, compared to 2021, when 7,802,000 cases and 95,000 deaths were reported. During 2000-2022, measles cases were prevented by the vaccine, and an estimated 57 million deaths occurred globally when compared with non-vaccination. (24) These deaths have been attributed to insufficient vaccination rates and individuals with a vaccine-hesitant attitude.(25)

Consequently, throughout the world during 2022 and 2023, the number of countries suffering significant or disruptive outbreaks increased from 36 to 57, and the expected number of measles cases increased by 20% globally, from 8,645,000 to 10,341,000.

The number of estimated measles deaths dropped from 116,800 in 2022 to 107,500 in 2023, an 8% decrease. During 2023, the number of reported measles cases increased to 663,795, an increase of 224% compared with the number of cases during 2022, 205,173 cases. (17) Among those, 163,991 cases and 2,406 deaths were reported from Africa,2024, and 28,636 cases and 216 deaths were reported from Ethiopia.

Nevertheless, measles is endemic in Ethiopia, and the annual rate of measles incidence has increased significantly. Currently, there is a high rate of measles incidence, with more than 50 cases per 1,000,000 people reported annually. (26)

Ethiopia remains the 4th-leading country in the world in terms of the burden of measles cases and is experiencing an ongoing measles outbreak, with more than 6933 measles confirmed cases in 2023. (27)And in BG, as per the PHEM directorate reported in 2023/2024, there were 2,993 cases and 83 deaths of measles listed in the line list and reported. More than 82% of incidence cases were attributed to children under. Along with this, a seasonal pattern of occurrence of measles outbreaks has been observed over the years.

The Morbidity and Mortality Weekly Report (MMWR), released on November 25, estimates that in 2021, 24.7 million children globally did not receive their first dose of the measles vaccination through routine immunization services, and an additional 14.7 million did not receive their second dose. Since measles transmits so efficiently, 89% to 94% vaccination coverage is needed to achieve herd immunity, depending on the setting, according to a 2017 WHO position paper.

The new report estimated that global measles vaccination coverage for the first dose in the 2-dose series decreased from a peak of 86% in 2019 to 81% in 2021, the lowest coverage since 2008. (28)

The result has major impacts on health for the community. This effect affects the duration of perceived illness, which was a long period of time (13.8 days) and time off work or school for a long day (9.6 days).

A person's health-related quality of life (HRQoL) is impacted by a specific medical condition or intervention. In another way, there is a discernible and quantifiable difference between how someone feels about their health and how it affects their daily life. This could mean that the patient experienced a decline in their physical abilities, emotional well-being, or social interactions as a result of the disease(29). And the economic impact of the measles outbreak on society as a whole, taking into account the costs of public health response, direct health costs, and lost productivity of those affected(30).

Additionally, un vaccinated of MCV 1 &2 were increase the accumulation of susceptible to resurgence of Measles outbreak, increasing childhood Mortality and morbidity of measles disease and additionally complication like, pneumonia, diarrhea, blindness and malnutrition it happens (22).

Previous similar studies revealed that factors determine the uptake of MCV2. The study in China, mothers' low educational level, occupation and place of delivery were factors to uptake of MCV2 (31). Similarly study in Kenya, distance to health institution, knowledge of MCV2 schedule, and other vaccine like Penta3, MCV1 were factor for uptake of MCV2(30).

Accordingly, study in Sudan and Tanzania Refusal to receive vaccinations stopping from cultural and religious beliefs was one of the reasons people did not get vaccinated and Poor mothers' awareness about importance of vaccine, lack of information returns back, unwillingness of health workers to open 10 dose vials for a single child were the reasons for low uptake of measles vaccine second dose. (32, 33) The same as the study in Jabitehnan District of Northwest Ethiopia, information about the vaccine, Mothers' knowledge of when to be fully vaccinated in 2020. (34) Based on the environment of each country, the age-specific target demographic for MCV2 is selected.

As a result, Ethiopia offers a second dose of the measles vaccination to children between the ages of 15 and 18 months.(27) (22) As we have seen above, some studies indicate that epidemics are occurring due to failure to take the measles vaccine for various reasons. Sustaining mental awareness, ensuring high immunization rates, and implementing routine surveillance are crucial tactics to eliminate measles. (35).

Despite the fact that an expanded control effort was initiated two decades prior to lessen measles-related morbidity and mortality, the illness continues to be a global public health concern.

Second dose of measles vaccination and associated factor studied among children 24-35 months of North Shoa Zone in2022, However, the study did not address other vaccines, such as vaccine supply issues, and trusted on MCV2 as a reliable source of information to improve performance, In this way, there is still a gup in addressing these issues because of the significant variation in MCV2 coverage, the factors that affect its acceptance, and difficulties in elimination measles in developing nations like Ethiopia, Moreover, a number of variables have been found to affect the coverage and uptake of measles second dose vaccination. For Example, a study conducted in Zhejiang, East China, showed that greater coverage of the second dose was related to higher maternal education, more births, and greater socioeconomic growth. (36)

Therefore, according to some studies, more research should be done to understand MCV2 utilization and the causes of low performance in nations, particularly in the Benishangul Gumuz Region, Ethiopia.

In Benishangul Gumuz Region and Assosa zone, the measles vaccination second dose administrative performance was 31% and 61%, respectively, during the year 2023/2024. (69)

Due to an unknown reason, the performance was very low in comparison to the national and WHO targets for unidentified causes. Accordingly, as a result of low vaccination coverage, the area may face a measles outbreak.

And additionally, Three out of nine districts in the zone have an international boundary shared with the Republic of Sudan. There was a significant increase in internally displaced people (IDPs) and immigrants from Sudan in the Assosa zone, where there is a high level of population movement, and also in different districts, confirmed Measles outbreaks were currently happening. So, this study helps healthcare professionals by providing guidance on taking appropriate measures.

The timing of MCV1 and MCV2 vaccinations may vary depending on the measles vaccination coverage and transmission rate. Thus, it is essential to vaccinate children under five at all times (74). As a result of this, the 24-to-35-month age range is a suitable one to get accurate data about MCV2 vaccination status, since children in this age range share nearly the same birth cohort as those under 24 months. Although this is a recent vaccination program, little is known concerning the uptake of the measles-containing second-dose vaccine and the factors that contribute to it.

Therefore, in order to recommend suitable interventions that enhance the uptake of measles second dose vaccination, data on the level of measles second dose vaccination and its determinants are required. Thus, the purpose of this study was to evaluate the uptake of the

second dose of the measles vaccination and the variables that are related to it in children in Assosa zone BG, Ethiopia, who are between the ages of 24 and 35 months.

1.3. Significance of the study: -

The findings of this study will assist the government and its partners in developing policies, programs, and a preferred plan for disease control by interpreting the characteristics of measles second-dose uptake. And planners further redesign at the country as well as sub-country level, and help the society in general to have an understanding of how measles vaccination can prevent measles disease.

Healthcare professionals should take appropriate measures and recommended interventions to protect the target population against the illness. Reduce the time spent in medical facilities and the expenses associated with health care. And expected to stop future Measles disease outbreaks due to the Measles antigen or document will help reference in other upcoming studies, provided it indicates for other researchers.

2. LITERATURE REVIEW;

2.1. Measles two Vaccination coverage

Since measles is a highly contagious illness, 9 out of 10 individuals who get infected will eventually have the illness. This might spark a pandemic. When there are more cases than anticipated, an outbreak of measles can be proclaimed. This is accurate in cases where the population develops herd immunity and is not vaccinated. Due to the COVID-19 pandemic, around forty-one countries terminated their measles immunization programs in 2020–21. In many nations, the danger of an outbreak increased when measles vaccination campaigns were discontinued. (24)

The Global Measles and Rubella Strategic Plan 2012-2020 included the strategies. A few of the plan's main objectives included giving every child two doses of the measles vaccine and carrying out follow-up vaccination campaigns. (8) The MCV1 and MCV2 vaccinations should be spaced out by at least one month in terms of dosage. (37)According to a 2019 study, MCV2 coverage was higher than in Indonesia. (38)

According to a 2014–2018 study conducted in Myanmar, just 22% of the 1907 cases of measles cases had received vaccinations. Of this number, 70% had a single vaccination dosage. Over a five-year period, the annual vaccination coverage for MCV1 and MCV2 varies from 83 to 93% and 78 to 87%, respectively. Thus, the study found that MCV coverage was less than 95% in approximately 80% of cases of measles that were recorded. (39)

A study on Malawi's immunization registry and home-based MCV2 record was carried out in 2020. The MCV1 and MCV2 vaccination coverage was 94% and 67%, respectively, based on the home-based immunization record and parental recollection. (14)

According to 2020 research, only 35.4% of respondents said their children had immunization records. Of those who received a card vaccination, 96.4% received BCG, 96.5% Penta1, 85% Penta3, and 85.6% MCV1. other reasons people had not received vaccinations were fear of adverse effects (31%), beliefs (20.7%), and barriers relating to religion (3.4%). (40) A study on the second dosage of the measles vaccination in North Showa, Ethiopia's urban regions found that the prevalence was 42.5%, while the first dose's prevalence was 88.7%.

Even when their child is ill, more over three-fourths of parents said they still bring them to vaccination locations.(41) Just 9% of Ethiopian children between the ages of 24 and 35 months received the second dose of the measles vaccine (MCV2), according to the EMDHS 2019 study.(42)

2.2. Factors associated with the Measles second dose Vaccine

Measles vaccination uptake is attributed to a number of factors, including sociodemographic ones (birth order, place of residence, mothers' and caregivers' educational attainment, income status of caregivers during ANC/PNC visits), aspects of the health care system (such as nearness to a health facility, health education and counseling, and vaccine stock outs), and factors specific to each parent (i.e., fear of vaccine side effects, supposed importance of vaccine, and availability of immunization card).

2.2.1 Socio-demographic factors

The measles vaccination uptake among children is primarily determined by a number of sociodemographic factors, including place of residence, income status of mothers or caregivers, ANC and PNC follow-up, and maternal determinants of complete child immunization, such as mother or caregiver below years, having less than three children in the birth order, completing at least post-secondary education, and maternal unemployment. Various studies have demonstrated that various sociodemographic factors may have an effect on the child's measles vaccine.

Place of residence

Among other factors associated with vaccine uptake, children from urban areas have demonstrated a strong influence in finishing their immunizations. However, since the MCV2 vaccination was a part of the standard EPI program, regarding MCV2 coverage in Ethiopia's rural and urban areas, not much is known. Study in North Shewa Zone, Amhara region has some zonal reports of MCV2 coverage from urban areas.(41) Therefore, the study was conducted to assess the uptake of MCV2 and to identify the reasons for not taking the vaccine in the rural area of Assosa Zone, BG, Ethiopia. Children in urban regions are more likely than those in rural areas to obtain all recommended vaccines (62% versus 36%), according to Mini-EDHs-2019.(42)

Mothers/ Care givers' Level of education

Mothers with higher levels of education are more likely to finish the immunization schedule than those with lower or no formal education. Mothers' education levels have a significant impact on immunization uptake. (43) Study in India: a strong correlation between the mother's educational attainment and the children's immunization status. (44) According to the 2019 Ethiopian Mini Demographic Health Survey, children whose mothers have completed more than secondary education (65%) are more likely to have received all recommended

immunizations than children whose mothers have not completed any education. (42)The same as Jabitehnan District, Northwest Ethiopia. (41)

Income status of Caregivers/mothers

Children from families in the wealthiest quintile are more likely than children from households in the lowest quintile to obtain all basic vaccines (67% versus 26%), according to study analysis from the 2019 Ethiopia Mini demographic and health survey. (42) According to a study conducted in the Dabat demographic, mothers or caregivers from wealthy homes were 2.4 times more likely to finish their child's vaccinations than mothers or caregivers from the poorest households. (45)

Mother Occupation

Maternal occupation plays a crucial role in child health immunization. Providing health education to mothers, informing them about vaccine types, strengthening home visits, and ensuring health worker availability are key strategies to improve immunization coverage. A study in Ebonyi State revealed that mothers who do private business were 2 times more likely to have good uptake of the MCV-2 vaccine compared to farmers/housewives. This study also revealed that there was a significant association between the maternal occupation (Private business) of the mothers and uptake of the vaccine. (46) Study in India, religion, father's education, and household head's occupation remained a problem to get the second dose of measles. (47)

2.2.2. Health care system factors

Distance to health facility

Various studies indicate that one factor contributing to the distance between health facilities is the availability of the measles vaccine. Research in the Northwest Ethiopian District of Jabitehnan In addition, mothers and caregivers who live less than 30 minutes away from the vaccination site. (41) Additionally, problems with the route to the medical facilities, like inadequate roads, motion sickness, and travel anxiety, may contribute to the absence of MCV2. (48) Study in Ebonyi state, the Southeastern part of Nigeria, where respondents were given for incomplete immunization mothers, mothers agreed that immunization centers are far from home. (46) Study in Northwest Ethiopia, far from the vaccination center and Home.(49)

Mothers waiting Time

It is thought that the fact that mothers who come for vaccination services stay in the health organization may be a problem, so a Study was conducted in West Gojam Yuliana Dinsa District, Amhara. Maternal waiting time (>45 min) for child vaccination risk factors to default to the child for completion of vaccination. (49) Study in North Showa Zone, Central Ethiopia, 2022, average time mothers had been waiting for vaccination at the health facility was identified as a factor associated with MCV2 vaccination. (41) another study in the Southeast Bale Zone, Oromia Region, people waited more than an hour for measles vaccination at health facilities. (50)

Health Education/Counseling

When moms visit the immunization clinic, it's possible that they won't be told when their next appointment is or what type of vaccine, they received to prevent the illness. Direct word-of-mouth advertising by an honest and well-known person can help agree that vaccinations are viewed positively. (22) Jabitehnan District research providing MCV2 information. Not only that, but mothers and caregivers who were informed about the second dose of the measles vaccination were more likely to enroll their kids in the immunization than those who were unaware of it.

Furthermore, 72.2% of those who did not receive the second dose of the measles immunization did not know the timetable. (41) The other study in the North Showa Zone, Central Ethiopia, found that factors related to MCV2 vaccination included awareness of required measles doses. (41)Another study in the Southeast Bale Zone, Oromia Region did not receive counseling(50)

2.2.3 Parental/individual factors

Antenatal and postnatal Care Visit

According to studies, ANC significantly influences incomplete vaccination. A study carried out in Sub-Saharan Africa found that MCV2 consumption was positively linked with four or more ANC visits, PNC visits, and health facility deliveries. (48) The Yilma Densa District, West Gojam study found that women who had not attended ANC follow-up were associated with a lower coverage of children receiving all recommended vaccinations.(49)

Fear of vaccine side effects

Any adverse medical event that occurs after vaccination but does not always have a direct link to the use of the vaccine is referred to as a side effect. In actuality, though, no

vaccination is risk-free, and side effects can sometimes occur following a vaccination. (40) While the measles vaccination's adverse effects have not been investigated, other vaccine types have been linked to side effects in certain studies. It was found that respondents who were afraid of vaccine side effects were three times more likely to default on their child's vaccination than respondents who were not. (51) Study in Ebonyi State, South-Eastern Nigeria, identified that children got sick after the first dose, had no chance to go to the facility, and frequent cancellations of immunization sessions. The other study in India found that parents' anxiety about vaccine side effects after immunization and their child's unavailability during vaccination were the main causes of missing doses.(47)

Availability of immunization card

Vaccination cards are essential tools for making sure kids get all the shots they should, on time. In Ethiopia, it was observed that 31% of children aged 24-35 months and 45% of children aged had ever possessed a vaccination card. Interviewers were able to observe a home-based record, vaccination card, or booklet for 26% of children aged 24-35 months (52).

The presence of an immunization card was found to be connected with vaccine dropout, according to research on the rate of immunization dropouts conducted in Ghana. (51) And having an immunization card (as opposed to not having one: those without a card) (53).

Place of Delivery

Whether a child is born in a healthcare facility vs. at home can greatly impact their likelihood of receiving complete vaccinations, with studies consistently showing that children born in health facilities are more likely to be fully immunized compared to those born at home. Study on Home delivery was risk factors for defaulting on Measles of vaccination **(54)** other study on Sub-Saharan Africa, health facility delivery was positively associated with MCV2 utilization.(50)

3. Conceptual Framework

The dependent variable is Second Dose Measles vaccine uptake, among children aged 24-35 months, Assosa Zone, BG, Ethiopia. The independent variables that affect uptake of Measles second dose include: -Health care system factors like Distance to health facility, Health education / counseling and Waiting Time; Sociodemographic factors like Place of residence, Parental level of education, and income status of parents/care giver and Parental /individual factors like Vaccine side effects, availability of immunization card and Antenatal care visit.

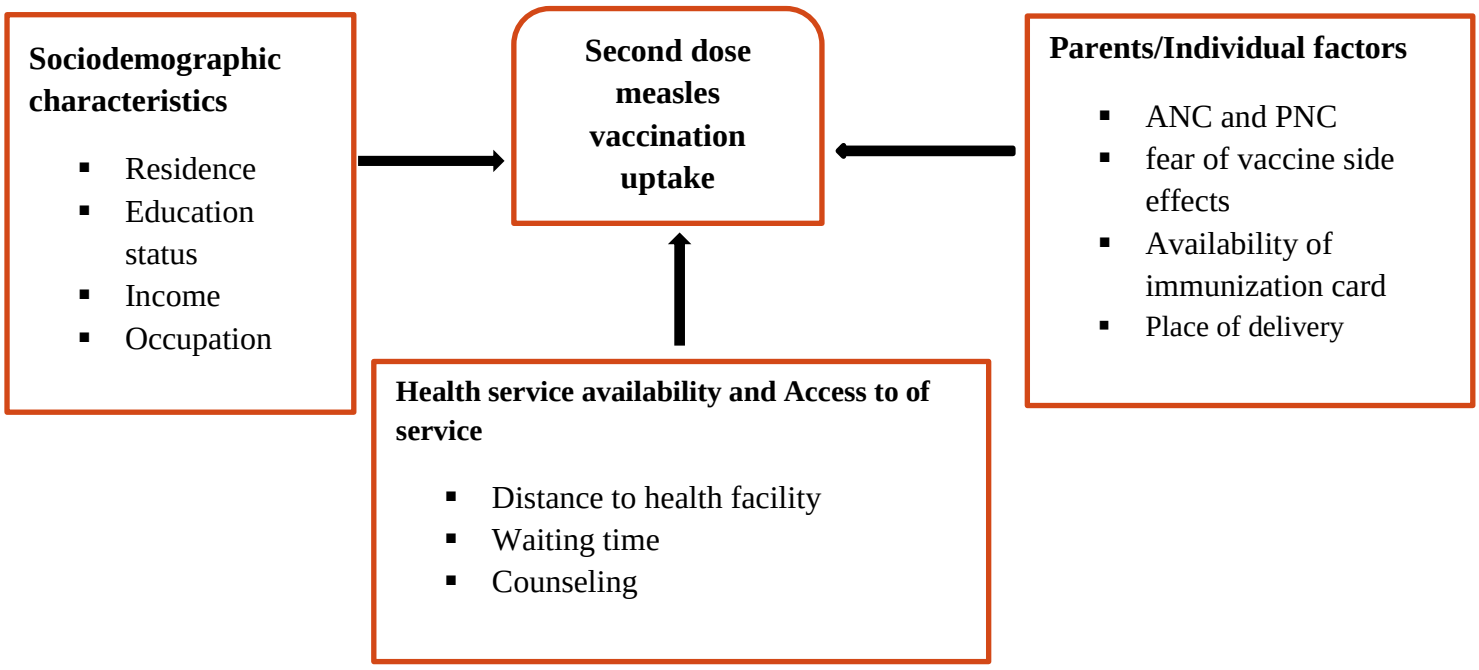

Figure 1 conceptual Frame of MCV2 utilization and related parameters shown schematically

4. Objective

4.1. General Objective

To assess measles vaccine second dose uptake and its associated factors among children between 24 and 35 months of age in Assosa zone, BG, Western Ethiopia, 2024

4.2. Specific objectives

- To determine prevalence of second dose measles vaccine uptake among children between age of 24 to 35 months in Assosa zone, BG, Western Ethiopia.
- To identify associated factors with second dose measles vaccine uptake among children between 24 and 35 months of age in Assosa zone, BG, Western Ethiopia.

5. Methods and Materials

5.1. Study area, period, and Design

A community-based cross-sectional study design was conducted in Assosa zone (Bambasi, Bildiglu, and Kurmuk District) BG, Ethiopia between October 1 and November 30, 2024. The zone is located 665 kilometers west of Addis Ababa. The zone has a surface size of 12,206 square kilometers and an elevation of 580–1510 meters above sea level, and the district was 46km, 72km, and 96 km respectively, from the capital city of Benishangul Gumuz Region. The zone is structured into 9 woredas and 240 Kebeles. With a population of 452,165, according to the 2007 Census. Assosa zone 189 health posts, 24 health centers, one general hospital, one primary hospital, 6 private clinics, 3 NGO Health centers, and 4 drug stores to provide community health services.14,228 children in the zone are eligible for MCV2 vaccination according to the Census prediction, which uses conversion factors of 3.07% of BG.

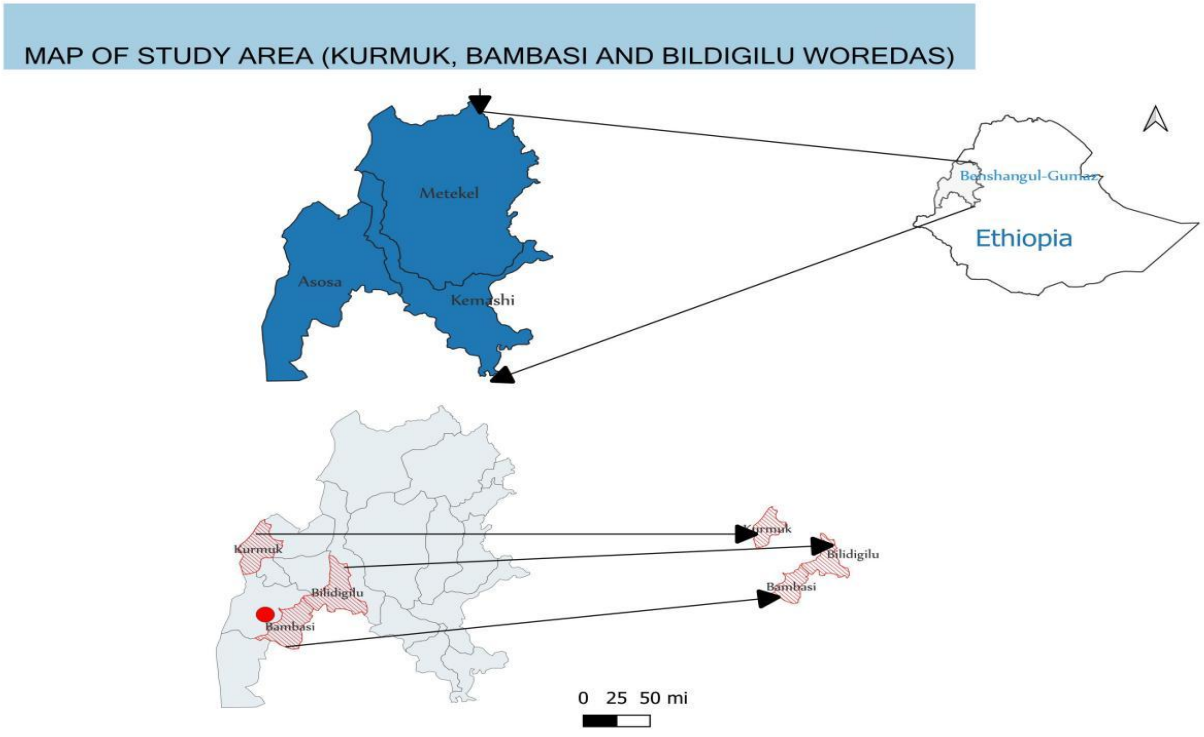

Fig. 2. Map of the Assosa zone and the three woredas of Benishangul Gumuz Region, Ethiopia, 2024

Source, study population and study unit

Source of population was all households with children under five years whose who have been residing in Assosa zone, for at least six months in selected woreda (Bambas, Bulidiglu and Kurmuk). Mothers or caregiver with children aged 24-35 month who lived in selected kebeles

of three districts and received their first dose Measles vaccine was population study and house hold with 24-35 month of age of child received their first dose of measles vaccination was randomly selected from selected district and selected kebeles was our study unit.

5.2. Sample size determination Procedure and Sampling technique

Sample Size determination

Based on a single population proportion formula with a 95% confidence level, a 5% margin of error, and percentage, the sample size was calculated as follows and Proportion = 48.1% according to study conducted in Jabitehnan District, Northwest Ethiopia was taken (34). (Since the study area of attention has not been studied before),

$$n = \frac{Z\frac{\alpha^2}{2}P(1-P)}{d^2} = \qquad n = \frac{(1.96)^2\ 0.481(1-0.481)}{(0.05)^2} * 2 = \quad 382.6*2\ *10\% = \mathbf{842}$$

Were, n= Sample size,

Z= 1.96, critical value with confidence interval (CI), 95%

d= margin of error, 5%, = 0.05

With Design effect =2

P-average proportion of 48.1% (Study in Jabitehnan District, Northwest, Ethiopia)

Based on the specification of the formula, we got 765.2. After addition of 10% non-response rate to the calculated sample size, the final sample size is 842.

To determine the samples size of factors, three variables selected from studied in Gondor and North west, Ethiopia. Then, the sample size was calculated using Epi-info and all three variables size become lower than the prevalence sample size. Therefore, the final sample size become 842 which was calculation obtained from prevalence one.

Table 1 Sample size determination for factors

Variables and reference	AOR	Sample Size	Remark
ANC follower (45)	5.18	101	
Attitude of mother (45)	1.97	50	
postnatal care visits of the mother	2.4	336	

Sampling Techniques

The zone has nine administrative districts, first identified thirty percent (30%) of the districts was chosen at random according to WHO's 2005 Immunization Coverage Survey guidelines. (46) We used multistage sampling. In three districts, there are ninety-three kebeles in all.

Thirty (30) of the totals were chosen using a lottery method. The sample size was distributed proportionately across the chosen kebeles. The samples were proportionally allocated to each kebele based on the number of households, The health post created a sampling frame, which was a list of women, sourced from the community health information system's family folder. The necessary participants were then selected using a list of children between the ages of 24 and 35 months and a straightforward random sampling approach. (Fig.3)

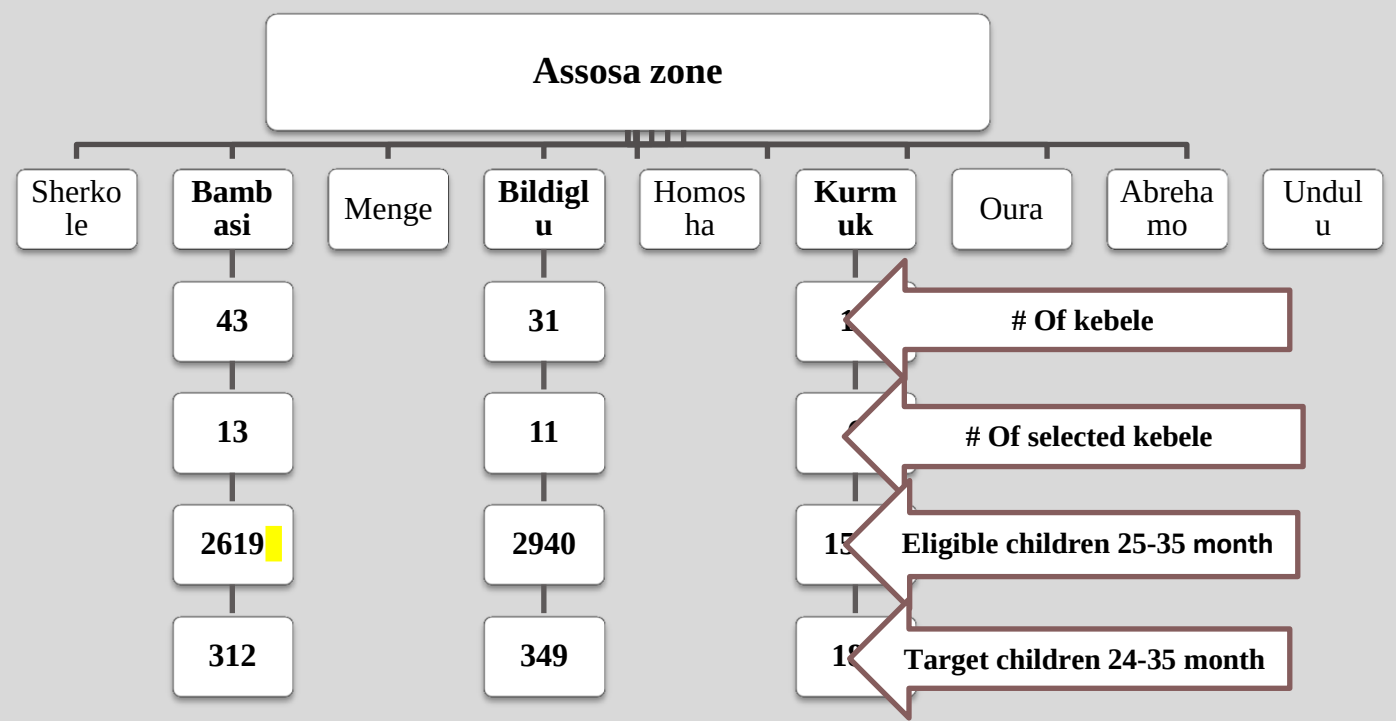

Figure 3 Schematic Presentation of sampling technique.

Operational definition and measurements

Measles second dose vaccine uptake

It is the uptake of second dose of measles vaccine after being first dose of measles vaccinated. (22, 55)

Caregiver: It is nearly always women who are the primary care givers (more responsible person)(56)

Distance to Health facility refers to the distance between the immunization facility and the service user's home. It was classified as walk of≤5km and or ≥5km. (57) And the World Health Organization (WHO) recommends that for optimal access everyone should live within 5 km radius to a health facility.(58)

Waiting time to immunization; Mothers or care giver who wait ≤ 30 min and wait ≥30 min for immunization service after arrival at health facility was considered as acceptable and long waiting time respectively. (3, 59)

5.3. Data collection tool and procedure

A face-to-face interview using structured questionnaires were conducted and observation of immunization card. The questionnaires were adapted from different reviews of the literature. (3, 60, 61) and Ethiopian Mini Demographic Health survey 2019(EDHIs) (42) was used to collect socio-demographic, socioeconomic, maternal and health facility related variables. Eleven (11) Well-trained health worker was involved and recently graduated health students and experienced to data collected. The data collected process started immediately after preparing the list 24-35 month of age at Health facility from selected kebele. If a house is locked during data collection, the next house will be interviewed; otherwise, the house was visited three times. The method of systematic sampling technique was employed for household selection. Information of the children vaccination was obtained by requesting mother or care giver to show the vaccination card to data collector and verbal reports if immunization card is not available.

Inclusion criteria

- Children with their/caregivers living in selected three woreda, and those who had a chilled age between 24 and 35 months.
- The age mother or care giver age greater than 18 year and above was included in this study
- If the household had more than one eligible child, the youngest child was selected using the lottery method.

Exclusion Criteria

- Mothers or caregivers who lived less than 6 months in the study area
- Those who have not received the first measles vaccine

5.4 Study Variables

Dependent Variable: -

Measles vaccine second dose uptake

Independent variables*: -*

Socio- Demographic Factors

- Place of residence
- Mother/care giver level of educational
- Income status of care givers

- Marital status
- Religious
- Occupation

Health Care System Factors

- Distance of health facility
- Health education / counseling
- Distance to health facility
- Waiting time
- ANC service
- Place of delivery
- PNC service
- Vaccine availability

Parental Individual Factors

- fear of vaccine side effects
- Availability of immunization card
- About measles and vaccination
- Immunization schedules
- Source of information

5.5. Analysis Procedure and Data Collection

Data were coded, entered in to Epi-data v4.7.0 and exported to SPSS version 27 software for further analysis and data were cleaned by manual. The Descriptive statistics of respondents' baseline characteristics were compiled into tables, graphs, and charts. Additionally mean, median, proportion and frequency were used to describe the study population concerning relevant variables. Before the analysis was done the assumption of the binary logistic regression model were checked. Then, bivariable analysis was agreed out to find candidate variables for multivariate analysis. Those variable with a P-value <0.05 in bivariate analysis were included in the multivariate analysis to adjust for confounders. An adjusted odd ratio with 95% CI was estimated to identify factors associated with second dose of measles vaccine uptake, and they were declared statistically significant at P-value less than 0.05.

5.6. Management of Data quality

Supervisors and data collectors have received three-day data collection training. The training mainly focused on data quality, privacy and confidentiality. The procedure of gathering data

were constantly monitored by the lead investigator and supervisors. Pretest was conducted 5% of mother or caregiver from other kebele that has similar characteristics, which is not participated in study area, and adjustment were made based on the result of the pretest. The data were checked daily completeness and accuracy by supervisor and investigators. Before analysis was running, the cross tabulation of each variable with outcome was done. The questionnaire was prepared by English, and translated in to Amharic, and returned to English to consistency and for analysis and arrangement.

5.7. Ethical consideration

Ethical clearance was gotten from Bahir Dar University, College of Medicine and health Science ethical review board and Permission letter was obtained from Benishangul Gumuz. Then, an official letter of cooperation was given to Assosa zone Health department and all selected district offices. Before starting data collection, the interviewers explained about the objective, benefit and risks of the study to get informed verbal consent of participants. The right of the respondent to withdraw from the interview or not to participate was respected. To maintain the privacy of participants.

6. Result

Socio-demographic characteristics of mothers and children 24-35 months of age

A total of 842 children 24 – 35 months of age were included in the study with response rate of 98.4% Of the total participants, around half of the participant of mother or care taker 418(50.4%) were age between 25 and 35 old, with mean age was 32.41 (SD 5.941) years. Of the study participants 597 (72%), were married. Around 597 (72%) of the participants were from rural areas, and 379 (45.6%) of the respondents identified as Muslims, followed by Orthodox (275 (33.2%). 464(56%) of the interviewees had completed primary school. In terms of occupation, 387 (46.6) were farmers. 453(54.6%) of the respondents have a family size of four to five.

Table 1. Socio-demographic characteristics of mothers/caregivers of children aged 24–35 in Assosa zone BG, Ethiopia, 2024. (N=829)

Characteristics	*Frequency*	*Percent*
Resident		
Urban	*232*	*28*
Rural	*597*	*72*
Maternal age		
≤24	*71*	*8.6*
25-34	*418*	*50.4*
≥35	*340*	*41.0*
Mother's education		
No formal education	*238*	*28.7*
Primary	*464*	*56.0*
Secondary	*101*	*12.2*
College and above	*26*	*3.1*
Occupation		
Housewife	*128*	*15.4*
Farmer	*387*	*46.7*
Dailly Laborer	*154*	*18.6*
Merchant	*126*	*15.2*
Governmental employed	*34*	*4.1*
Parent's marital status		
Single	*31*	*3.7*
Married	*597*	*72.0*
Separated	*67*	*8.1*
Divorced	*115*	*13.9*
Widowed	*19*	*2.3*
Monthly income		
≤3500	*292*	*35.2*
From 3501-7500birrs	*433*	*52.2*

	≥7501 birrs	*104*	*12.5*
Family size			
	1-3	*232*	*28.0*
	4-5	*453*	*54.6*
	≥6	*144*	*17.4*
Number of children < 5			
	One	*628*	*75.8*
	Two	*192*	*23.2*
	Three and above	*9*	*1.0*
Sex of children			
	Female	*364*	*43.9*
	Male	*466*	*56.1*
Religion			
	Muslim	*379*	*45.6*
	Orthodox	*276*	*33.3*
	Protestant	*175*	*21.1*

Other Utilization

The majority of the study's participants, 545(65.7%) children, were between the ages of 24 and 29 months. Among these children, 443 (53.3%) have an immunization card Only 279 (33.7%) received the second dose of the measles-containing vaccine (MCV2), And 443(53.4%) of children were have immunization card.

Table 2. Children's utilization of other vaccinated in Assosa zone, BG, 2024.

Variables	***Characteristics***	***Frequency***	***Percent (N=842)***
Age of child (completed month)	24–29month	545	65.7
	30–35	284	34.3
Availability of vaccination cards	Yes	443	53.4
	No	386	46.6
MCV2	Yes	279	33.7
	No	550	66.3
	No	477	57.5

Respondent access to health care service-related characteristic

At the health facilities, approximately 706 (85.2%) of participants received antenatal care, while 253 (30.5%) received postnatal care. Similarly, the majority of respondents (78.8%) reported traveling less than 5 kilometers to reach the vaccination center. However, more than 70.9% of them waited over 30 minutes to access vaccination services, as shown in Table 3.

Maternal or Caregiver-Related Characteristics

Around 659 (79.5%) of respondents were unaware of the MCV2 vaccination schedule, and 74.4% had no knowledge of the second dose of the measles vaccine. Regarding sources of information about MCV2, 40.2% of participants reported hearing about it primarily from neighbors. Other sources included health workers (32.2%), the Women's Health Development Army (WHDA) (20.4%), radio (0.8%), and other sources (4.1%).

Among the respondents, 214 (25.8%) reported returning home without vaccinating their child after visiting the vaccination center, mainly due to the unavailability of vaccinators during the vaccination session, as presented in table 3.

Table 3. Obstetric history, access information, maternal awareness, of mothers/caregivers with having children aged 24–35 months in three districts, 2024

Variables	*Characteristics*	*Frequency*	*Percent (N=842)*
ANC Visit	Yes	706	85.2
	No	123	14.8
Place of delivery	Health institution	624	75.3
	Home	205	24.7
PNC Visit	Yes	253	30.5
	No	576	69.5
Distance of vaccination site	≤5km	653	78.8
	≥5km	176	21.2
Mother waiting time at vaccination site	≤30minut	241	29.1
	≥30minut	588	70.9
Knowledge about immunization	Good	212	25.6
	Poor	617	74.4
Source of information	Neighbor	333	40.1
	HW	267	32.2
	WHDA	169	20.4
	Television	20	2.4
	Radio	7	0.8
	Other	33	4
Awareness of MCV2 schedules	Yes	170	20.5
	No	659	79.5
MCV2 vaccination uptake by district	Bambasi	91	32.6
	Kurmuk	61	21.8
	Buldigulu	127	45.5

Magnitude of the second dose of the MCV2 vaccination

Over all uptake of second dose of measles vaccine among children 24-35 month of age in Assosa zone, was 33.7 % (95% CI: 30.4, 37.0). Among 32.6% (91) vaccinate MCV2 children were from Bambasi, 21.8% (61) from Kurmuk and 45.5% (127) were from Buldiglu District.

Factors associated with Measle second dose of vaccine uptake

In the bivariate logistic regression analysis, twelve variables were significantly associated with the uptake of the second dose of the measles vaccine (MCV2) at a p-value < 0.05, by checking of the model fitness of Hosmer and Lemeshow test and fits with P-value 0.083. These included: distance to the health facility, place of delivery, knowledge of the number of measles vaccine doses, lack of knowledge on recommendation of measles vaccination schedule, belief that all children should be vaccinated against measles, availability of an immunization card, vaccine unavailability, maternal workload, fear of adverse events following immunization (AEFI), perception that there are too many vaccines, long waiting times, and lack of trust in immunization. These variables were considered for further analysis.

In the multivariate logistic regression analysis, Place of Delivery, Availability of Immunization Card, Maternal Workload, Fear of Side Effects, Vaccine Quantity Perception and Waiting Time were significantly associated with MCV2 uptake.

The result of this study reviled that, Children who born at health institution were 1.8 times more likely to receive the second dose of the measles vaccine compared when to compare those children who born at home [AOR = 1.75, 95% CI: (1.216, 2.517)]. Mothers or caregivers who retained the child's immunization card were 1.4 times more likely to ensure MCV2 uptake than mothers/care givers without immunization card [AOR = 1.430, 95% CI: (1.034, 1.977)].

The result of the study shows that, Mothers with a lower workload were 73% more likely vaccinate their children MCV2 vaccine than mothers with a heavier workload [AOR = 0.27, 95% CI: 0.169,0.44]. Mothers who did not fear adverse effects from the measles vaccine were 7.8 times more likely to vaccinate their children than those who did [AOR = 7.76, 95% CI: 4.01,14.08]. Mothers who believed their children were no receiving too many vaccines were 8.2 times more likely to seek MCV2 vaccination when to compared to those who felt the number of vaccines was excessive [AOR = 8.197, 95% CI:(4.868, 13.801)].

Shorter waiting times were also significantly associated with MCV2 uptake. Mothers or caregivers who did not experience long waits were 4.4 times more likely to have their children vaccinated than those who did [AOR = 4.438, 95% CI: (2.986, 6.597)]. Table 4.

Variable		MCV2 Received		OR with 95% CI		P-value
		Yes	No	COR	AOR	
Distance to reach health facility	<5km	205(73.5%)	448(81.5%)	0.63(0.448,0.888)	1.242(0.841, 1.834)	0.276
	>5km	74(26.5%)	102(18.5%)	1		
Place of delivery (1)	Home	193(69%)	431(78%)	1		
	HF	86(31%)	119(12%)	1.614(1.166,2.234)	1.75(1.216, 2.517)	0.003*
knowing number of measles vaccine dose	Yes	38(13.6%)	122(22.2%)	0.553(0.372,0.828)	1.380(0.721, 2.644)	0.331
	No	241(85.4%)	428(77.8)	1		
MCV2 schedule knowledge	Yes	43 (15.4%)	127(23%)	0.606(0.415,0.888)	0.974(0.518, 1.831)	0.934
	No	236(84.6%)	423(77%)	1		
MCV2 vaccine mandatory for all children	Agree	88(31.5%)	136(24.7%	1.4(1.02 ,1.92)	1.109(0.778,1.581)	0.57
	Disagree	191(68.5%)	414(75.3%)	1		
Availability of immunization card? (1)	Yes	164 (58.8%)	279(50.7%)	1.385(1.035,1.853)	1.430(1.034,1.977)	0.031*
	No	115(41.2%)	271(49.3%)	1		
Availability of vaccine (1)	Yes	7(2.5%)	1(0.2%)	14.129(1.730,115.415)	6.49(0.75,55.54)	0.088
	No	272(97.5%)	549(99.8%)	1		
Mothers becomes busy (1)	Yes	31(11%)	93(17%)	0.614(0.398,0.949)	0.27(0.169,0.44)	<.001*
	No	248(89%)	457(83%)	1		
Fear of side effect (1)	Yes	12(4%)	77(14%))	1		
	No	267(96%)	473(86%)	3.62(1.93,6.78)	7.76(4.01, 14.08)	<.001*
Vaccine to be many (1)	Yes	23(8%)	118(21.5%)	1		
	No	256(92%)	432(78.5%)	3.04(1.89,4.87)	8.197(4.868, 13.801)	<.001*
long wait times at health facilities (1)	Yes	52(19%)	170(31%)	1		
	No	227(81%)	380(69%)	1.95(1.37,2.775)	4.438(2.986, 6.597)	<.001*
Trust in immunization (1)	Yes	273(98%)	549(99.8%)	12.06(0.54, 40.267)	4.707(0.028,2.038)	0.158
	No	6(2%)	1(0.2%)	1		

Table 4. Multivariable logistic analysis of factors associated with MCV2 uptake among children age 24-35 month in Assosa zone BG, Ethiopia. 2024/2025

7. Discussion

In this study, the uptake of the second dose of the measles-containing vaccine (MCV2) among children aged 24–35 months was found to be 33.7% (95% CI: 30.4, 37.0). This finding is comparable to studies conducted in Nigeria and the Oromia Region of Ethiopia. (13, 62) , and aligns with research from South-Eastern Nigeria, where the majority of caregiver were also aged between 25 and 34 years(46).

However, this coverage was lowered than that studied in the North Shao Zone (42.5%) and Northwest Ethiopia(48.1%) (41, 63), though it exceeded the studied figure from the Somali Region (21.4%) (1). Compared to global standards, the uptake remains low. According to the 2022 *Morbidity and Mortality Weekly Report* (MMWR), global MCV2 coverage was 74% with regional variation: Africa (45%), Americas (76%), Eastern Mediterranean (78%), Europe (91%), Southeast Asia (85%), and the Western Pacific (91%).(18) Similarly, WHO-UNICEF Estimates of National Immunization Coverage (WUENIC, September 2024) reported comparable national coverage in Angola (35%), Chad (35%), and the Republic of Congo (34%) (11, 19). In contrast, the 2019 Ethiopian Mini Demographic and Health Survey (Mini-EDHS) reported national MCV2 coverage of just 9%.(64)

Some countries are performing better, even though they are below the standards, like China (44.7%), (65), Trans Nzoia County in Kenya (56.2%). (66), Alego-Usonga Sub-County in Kenya (58.0%). In Southeast Asia, the MCV2 coverage reached 78.2% in 2021 (38) and Northwest Ethiopia, (44%) (49)The global target, however, remains ≥95%, emphasizing a significant gap in the current study population(67). This discrepancy may result from different data collection techniques, variations in how the measles second dose vaccine was introduced as part of a routine immunization program, and environmental factors that vary across the studies.

According to our study, Children born in health facilities were 1.75 times more likely to receive MCV2 when compared to those who were born at home [AOR = 1.75; 95% CI: (1.216, 2.517)]. This may be closer to the health service provided after delivery includes child health such as counseling on immunization program, well baby clinic visits growth monitoring, maternal related health problems, this may increase maternal knowledge toward vaccination related issues, hence health-seeking behaviors of mother improve and increase adherence and better access to postnatal counseling. This finding is consistent with studies conducted in Merhabete Woreda (Ethiopia), Senegal, Nairobi (Kenya), Sub-Saharan Africa, and China (31, 48, 68, 69).

Retention of immunization cards was positively associated with MCV2 uptake. Children whose caregivers retained these cards were 1.4 times more likely to be vaccinated [AOR = 1.430; 95% CI: (1.034, 1.977)]. Home-based records help caregivers track appointments and reinforce the importance of completing vaccination schedules and Mothers who carefully keep their children's vaccination cards may have a better understanding. This is in line with findings from the 2019 Ethiopian Mini-EDHS (which reported card retention at 26%) and studies from Merhabete District (70, 71).

Mothers with less workloads were 73% more likely to ensure their children received MCV2 [AOR = 0.27; 95% CI :(0.169, 0.44)]. This may be due to increased availability and flexibility to attend immunization appointments. A study from South-Eastern Nigeria similarly that busy schedules contributed to missed doses, with caregivers often assuming the first dose was sufficient.(46) Additionally, limited male involvement in child healthcare may increase the burden on mothers. Mothers who did not fear of vaccine side effects were significantly 7.8 times more likely to complete the MCV2 schedule [AOR = 7.8; 95% CI: (4.01,14.08)]. This fear often results from misinformation, previous negative experiences, or inadequate counseling. Similar concerns have been reported in studies from Nigeria and Japan (46, 47).

Caregivers who did not believe that their children were receiving too many vaccines were 8.2 more likely to complete MCV2 [AOR = 8.2; 95% CI: :(4.868, 13.801)]. This reflects the importance of vaccine literacy; mothers

with a good understanding of immunization schedules are more likely to follow through with full vaccination.

Mothers who did not experience long wait times at health facilities were significantly 4.4 more likely to vaccinate their children [AOR = 4.438; 95% CI: (2.986, 6.597)]. This is consistent with findings from East Bale Zone and Addis Ababa, Oromia Region and Nigeria (46, 50, 72, 73). Inefficiencies such as poor scheduling and communication, as well as limited staffing, may discourage caregivers from returning for follow-up doses. These findings highlight the urgent need for targeted interventions to improve MCV2 coverage. So, Promoting facility-based deliveries to ensure early engagement with immunization services, Ensuring the availability and use of immunization cards and educating caregivers on their importance, Addressing caregiver workload by offering flexible immunization schedules and expanding outreach services, Improving vaccine literacy and building public trust by addressing misinformation and providing accurate information about vaccine safety, and Reducing waiting times through improved service delivery, staffing, and scheduling at health facilities.

8. Limitation

However, this study has certain limitation, there might be social desirability bias related to self-reported data and some of the children had no vaccination card, and information about vaccination status had to be limited to the mother's verbal responses which might be liable recall bias. This study includes reports on receiving from registration books, vaccination cards, and verbal reports from mothers or caregivers. But the three reports showed significantly different uptake of the second dose of MCV, which could introduce recall bias. Moreover, the mother's and the children's names on the register do not match the ones that are provided to the community. And this study has not qualitative research.

9. Conclusions

The current study shows that measles second dose vaccine uptake in the current study area was too low compared to WHO target. The study also found significant variables that affect measle second dose vaccine uptake of children 24-35 months, such as Place of delivery, Availabilities of immunization card, Workload of mother, Fear of Adverse Event following immunization, Vaccine to be many and long waiting time at HF. Therefore, interventions that strengthen the health-seeking behavior of mothers/caregiver and all pregnant mothers encourage to give birth at a health facility and advise their children to complete all vaccinations. All health organizations should consult with the relevant authorities to ensure that the card is provided and that mothers keep the card they are given carefully. Due to the workload of mothers and the low participation of fathers, raising awareness among the community and encouraging children to receive the second round of measles vaccination. Experts provide good counseling to mothers about vaccine side effects and to get their children vaccinated, since mothers are afraid of the many numbers of vaccines, it is appropriate to advise mothers to take them in a safe manner. In addition, since mothers think that when they come to health organizations for services, they will be kept at health organizations, it is appropriate for health professionals to work with trained professionals as much as possible and to explain to mothers. Finally, emphasize MCV2 mass vaccination and regular strengthened supportive supervision for health extension workers,

10. Recommendation

To improve second dose of measles vaccinations, from the policy maker of government to the community the following points are recommended.

Ministry of Health/Policy maker

- In order to reduce the quantities of vaccines, a combination vaccine should be developed.
- To reduce the long waits and heavy workload of mother's, Government agencies should establish guidelines for routine vaccinations in private healthcare.

The Regional Health Bureau

- To give mothers birth in health facilities health professionals and traditional birth attendance should be trained
- It should be prepared and distribute cards to health institution

District Heath office

- At woreda level kebele leaders should engage in advocacy and awareness activities that encourage women deliver at health institution.
- I recommended timely requesting and delivering immunization cards to healthcare institutions.
- To increase awareness of community about measle vaccine, I recommend social mobilization.

At Health Facility level

- It recommends that staff members explain its benefits of vaccine and provide good counseling during ANC services.
- I advise health care provider to counsels' mothers properly document the cards they receive at service, and temporarily utilize alternative documents and family folders.
- In order to prevent mothers from having to long waiting time, when they arrive for vaccination services, the number of experts in the vaccination room should be increase
- I recommend for health care providers to continuing increase public awareness about vaccine side effects and it benefits
- Health institutions should be encouraging to provide home to home immunization services to minimize workload of mothers
- Health professionals should review records every month, track children who have not been vaccinated, and provide a list of children's names to the Woman Health Development Army (WHDA) so that they can be vaccinate

At Community level

- In order to encourage women to give birth at healthcare facilities, kebele leaders should support community engagement and mobilization activities.
- Although reducing mothers' workload requires men's participation, it is recommended that professionals give fathers as much counsel as possible.
- I advise mothers to properly documented the cards they receive from service

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Annexes I

Participant Information sheet

Title of the research project: - Assessment of second dose of the measles vaccination and associated factors among children age 24-59 Months in the Assosa zone of West Ethiopia, 2024

Name of principal investigator: Eskedar Yosef (BSC, EFELTP Resident, Bahir Dar University, Ethiopia)

Name of organization: Bahir Dar University, Ethiopia

Introduction: This information sheet is prepared with the aim of explaining the research project that I would like to inform you this short information concerning on this study. Just before going to our interview, you are requested to read very carefully to what I am going to interview you about the purpose and general condition of the study and may you tell me whether you agree or disagree to participate in this study.

Propose, Benefits, Risk, and Confidentiality of the research project: If you agree to take part this study, you are selected to be one of the participants in the study. The study will be conducted through interviews. It is hoped that the information you give us could help to improve MCV 2 uptake among children's and to design appropriate intervention to improve Measles vaccine utilization in Assosa zone. I will ask you, about fifteen to thirty minutes to help us in this study. The interview involves intimate for sleek of your secret and I would like to assure that the privacy should strictly be maintained throughout. Your responses given will be confidential and hence you do not need to tell us your identity and will not reveal your identity to anyone not part of this study. If a report of results is published, only information about the total group will be appeared and reflected.

Right to refusal: You have full right refusal to respond to the questions, will have no effect now or in the future on you and your family.

Personal contact: The research project reviewed and approved by Bashir Dar University ethical review commutes.

If you need details information you can contact by this address

Name: Eskedar Yosef (Email: eskedaryosef6@gmail.com, Cell Phone: 0934984227)

Informed Consents

Hello, good morning /Good Afternoon Sir /Ma/dam. My name is _____. I am Member of the research team of Bahir Dar University College of Medicine and Health sciences institute of public health department of biostatistics and epidemiology. The research is done on ---------- in your area. The study will be conducted through interviewer administered structured questionnaire.it has been designed to collect data from care givers/mothers who had children age between 24 months to 35 months in your area.

You are selected to be one of the participants in the study. Your selection to participate in this study is by chance alone and your responses given will be confidential. The responses you give will not reveal your identity to anyone not part of this study. The information you give us will help us to know, factors associated with low uptake of MCV2 vaccine among children to improve quality of Measles vaccine uptake for the improvement chilled health. Any publication of such information will conceal your identity. The interview is voluntarily, you are free to withdraw/interrupt your participation at any time of the study without any penalty. This will take about 15 to 30 minutes of your time. Are you Agree to participate in this study?

1. Yes ( ) 2. No ( )

Data collector Name---------- Sign-------

Supervisor Name---------- Sign--------

የአሳታፊ መረጃ ወረቀት ;

የምርምር ፕሮጀክቱ ርዕስ፡ - በአሶሳ ዞን ከ24-59 ወራት ዕድሜ ክልል ውስጥ የሚገኙ ህጻናት ሁለተኛ መጠን የኩፍኝ ክትባት እና ተያያዥ ምክንያቶች ለማጥናት፣2024

የዋና መርማሪ ስም፡ እስከዳር ዮሴፍ **(BSC, EFELTP Resident, Bahir Dar University, Ethiopia**)

የዩኒቨርሲቲዉ ስም ፡ ባህር ዳር ዩኒቨርሲቲ፣ ኢትዮጵያ

መግቢያ፡ ይህ የመረጃ ወረቀት የተዘጋጀው በዚህ ጥናት ላይ ይህን አጭር መረጃ ለማሳወቅ የምፈልገውን የምርምር ፕሮጀክት ለማስረዳት ነው። ወደ ቃለ ምልልሳችን ከመሄዳችሁ በፊት ስለ ጥናቱ አላማ እና አጠቃላይ ሁኔታ ቃለ መጠይቅ ላደርግላችሁ በጥሞና እንድትከታተሉኝ ተጠይቃችኋል እና በዚህ ጥናት ለመሳተፍ መስማማታችሁን ወይም አለመስማማትዎን ንገሩኝ።

የጥናት ፕሮጀክቱን ሃሳብ፣ ጥቅሞች፣ ስጋት እና ምስጢራዊነት፡ በዚህ ጥናት ላይ ለመሳተፍ ከተስማሙ በጥናቱ ውስጥ ካሉት አንዱ እንዲሆኑ ተመርጠዋል። ጥናቱ በቃለ መጠይቅ ይካሄዳል. እርስዎ የሚሰጡን መረጃ MCV 2 በልጆች መካከል ያለውን ቅበላ ለማሻሻል እና በአሶሳ ዞን የኩፍኝ ክትባት አጠቃቀምን ለማሻሻል ተገቢውን ጣልቃገብነት ለመንደፍ ይረዳል ተብሎ ይጠበቃል። በዚህ ጥናት ውስጥ እንድትረዱን ከአስራ አምስት እስከ ሰላሳ ደቂቃ ያህል እጠይቃችኋለሁ። ቃለ-መጠይቁ ለሚስጥርዎ ቅልጥፍና መቅረብን ያካትታል እና ሚስጥሩ በጥብቅ መጠበቅ እንዳለበት ላረጋግጥ እወዳለሁ። የተሰጡት ምላሾች ሚስጥራዊ ይሆናሉ እና ስለዚህ ማንነትዎን ለእኛ መንገር አያስፈልገዎትም እና ማንነትዎን በዚህ ጥናት ውስጥ ላልሆነ ለማንም አይገልጹም። የውጤቶች ሪፖርት ከታተመ ስለ አጠቃላይ ቡድኑ መረጃ ብቻ ይታያል እና ይንጸባረቃል።

ፍቃደኛ አለመሆን መብት፡ ለጥያቄዎቹ ሙሉ በሙሉ ምላሽ የመስጠት መብት አለህ፣ አሁንም ሆነ ወደፊት በአንተ እና በቤተሰብህ ላይ ምንም ተጽእኖ አይኖረውም።

ግላዊ ግንኙነት፡- በባሕ ዳር ዩኒቨርሲቲ የተገመገመው እና የጸደቀው የምርምር ፕሮጀክት ይጓዛል።

በመረጃ የተደገፈ ስምምነት፡

ጤና ይስጥልኝ ፣ ደህና ከሰአት / ደህና ከሰአት Sir /Ma/dam። የኔ ስም _____። የባህር ዳር ዩኒቨርሲቲ የህክምና እና ጤና ሳይንስ ኮሌጅ የህዝብ ጤና የባዮስታስቲክስና ኤፒዲሚዮሎጂ ክፍል የምርምር ቡድን አባል ነኝ። ጥናቱ የተካሄደው ---------- በአካባቢዎ። ጥናቱ የሚካሄደው በቃለ መጠይቅ አድራጊ የሚተዳደር የተዋቀረ መጠይቅ ነው።በአካባቢያችሁ ከ24 ወር እስከ 35 ወር እድሜ ያላቸው ልጆች ካሏቸው እንክብካቤ ሰጪዎች/እናቶች መረጃን ለመሰብሰብ የተነደፈ ነው።

በጥናቱ ውስጥ ከተሳታፊዎች አንዱ ለመሆን ተመርጠዋል። በዚህ ጥናት ውስጥ ለመሳተፍ የመረጡት ምርጫ በአጋጣሚ ብቻ ነው እና የተሰጡት ምላሾች ሚስጥራዊ ይሆናሉ። የምትሰጧቸው ምላሾች የዚህ ጥናት አካል ላልሆነ ለማንም ማንነትህን አይገልጡም። እርስዎ የሰጡን መረጃ የ MCV2 ክትባት በልጆች ላይ መወሰድ ዝቅተኛ ከሆነ ጋር ተያይዘው የሚመጡ ሁኔታዎችን እንድናውቅ ይረዳናል የኩፍኝ ክትባትን ጥራት ለማሻሻል የቀዘቀዘ ጤና። ማንኛውም የዚህ አይነት መረጃ መታተም ማንነትዎን ይደብቃል። ቃለ መጠይቁ በፈቃደኝነት ነው፣ በማንኛውም ጊዜ በጥናቱ ወቅት ያለ ምንም ቅጣት ተሳትፎዎን ለማቋረጥ/ለማቋረጥ ነፃ ነዎት። ይህ ጊዜዎን ከ15 እስከ 30 ደቂቃዎች ይወስዳል። በዚህ ጥናት ለመሳተፍ ተስማምተሃል?

1. አዎ 2. አይ

መረጃ ሰብሳቢው ስም ---------- ፊርማ ---

የሱፐርቫይዘር ስም ---------- ፊርማ ----

Annex;1

Questionnaire Identification number _____Name of interviewer _____Signature of interviewer_____ Date of completion _____ Time started _____ Time completed_____ Checked by supervisor: Name _____Signature_____ date_____

Table 2 MCV2 questionnaires, English version

Section A: Study of sociodemographic characteristics and the use of the second dose of the measles vaccination among children in the Assosa zone of West Ethiopia: Questions relevant to this study			
Section I. Socio-demographic related questions			
SN	**Questions**	**Response**	**Remark**
1	Mother's age (in year)	_____year	
2	Child's age (in month)	_____month	
3	Sex of the child	Female 2. Male	
4	Place of Residence	Urban 2. Rural	
5	Mother's marital status	Single 4. Divorced Married 5. Widowed Separated	
6	Mother's educational status	No formal Education Primary (1-8) Secondary (9-12) College and above	
7	Religion	Muslim Orthodox Christian Protestant Others (specify…….)	
8	Mother's occupation /Father	Housewife Farmer Dailly Laborer Merchant Government employed Others (Specify:_____)	
9	Parents monthly Income	1 less than 3500 birr 2. From 3501 -7500birr	

10	Family size	1-3 Chilled 4-5 chilled Greater than 6 children	
11	Number of children alive under the age of 5 years	One Two Three and above	
12	Ethnicity	1.Berta 2. Amahara 3. Oromo 4, Shinasha 5, Gumuz 6. Other specify	
Section II: Questions about health **services accessibility** and availability for the research of the second dose of the measles vaccination and related factors among children in the Assosa zone of West			
13	Is immunization service available in the area?	1.Yes 2. No	
14	Type of immunization strategy?	Fixed 2. Outreach 3. Mobile	
15	Average distance from home to Immunization service site by km	1. Less than 5Km 2. Greater than 5Km	
16	Waiting time to get service after arriving at health facility	1. Less than 15' 2. 15-30' 3. 30-45' 4. 45-60'	
17	Have Antenatal care visits at health facility during last pregnancy (ANC)	1. Yes 2. No	
18	Where was your place of delivery?	1. Home 2. Health facility	
19	Do you have post-natal care service?	1.Yes 2. No	
Section III: Knowledge, attitudes, and practice (Parents/Individual factors) questions from mothers regarding the use of the second dose of the measles vaccine and related factors among children in the Assosa zone of West Ethiopia			
Knowledge questions (Maternal knowledge, attitude, and Practice			
20	Have you know ever heard about measles second dose vaccination	1.Yes 2. No	
21	Do You Know the importance of measles	1.Yes 2. No	
22	Do you know Measles vaccination schedules?	1.Yes 2. No	
23	Do you know number of Measles dose a	1.Yes 2. No	
24	Do you know at what month recommended for 1st measles vaccination of child?	1.yes 2.No	
25	Do you know at what time recommended for 2nd dose measles vaccination of chilled	1.Yes 2.No	

26	If yes, in qu. 27 at what time recommended for 2nd dose	1 at 9 months 2.from 15-24 month 3.above the age of 24 month 4.Don't know	
27	Do you know about the side-effects of	1.Yes 2. No	
28	Do You Know about measles disease?	1.Yes 2. No	
Attitude questions			
29	Do you think measles to be highly dangerous	1. Agree 2. Disagree	
30	Do you think measles vaccine can prevent your children's from getting measles disease?	1. Agree 2. Disagree	
31	Do you think it is important to follow the	1. Agree 2. Disagree	
32	Do you think vaccination makes infants sick	1. Agree 2. Disagree	
33	How do you think the importance of	Agree 2. Disagree	
34	Do you think Infants took usually too many	Agree 2. Disagree	
35	Do you think all children should be vaccinated for measles and others antigens	1. Agree 2. Disagree	
36	Have you encouraged others to get vaccines?	1. Disagree 2. Agree	
Practice questions			
37	Did your child received MCV2?	Yes 2. No	
38	If yes at what age a child received MCV2	1.at 15 -18 month 2. 18-24 month, 3at	

39	if your answers are No for question number **37**, what is your reason not being vaccinated for MCV2	Vaccine not available Unaware of need for immunization Unaware of need to return for second dose. Place and/or time of immunization unknown Fear of side effects Wrong ideas about contraindications Place of immunization too far Vaccinator absent Time of immunization inconvenient . Mother too busy . Family problem, including illness of Mother . Child ill . Long waiting time	
40	Have you ever returned without getting Measles vaccination	1.Yes 2. No	
41	What type of information you received about measles Vaccination?	1.Benefit of vaccine 2.Vaccination schedule 3.Vaccine side effect 4.The disease severity 5.Other (Specify:_____)	
42	Who informed you about Measles vaccination?	1.HEW/HW 2.WHDA 3.Radio 4. Television 5. Neighborhood friends	

Section IV: Other Vaccines/antigens utilization questions for uptake of measles vaccine second dose and associated factors study among children in Assosa zone, West Ethiopia

Other Vaccines utilization questions, For the following antigens vaccination status, ask the respondent to bring the child's immunization card.

	Antigens	**Vaccination status**	
43	Have you immunization card	1.Yes 2. No	

44	At what age your child started vaccination?	1.At birth 2.After 2 weeks of delivery 3. At 45 days 4. Other(speci.) _____	
44	OPV0	1.Yes 2. No	
45	BCG	1.Yes 2. No	
46	Have BCG scar (by observe)		
47	Pentavalent1	1.Yes 2. No	
48	Pentavalent3	1.Yes 2. No	
49	Fully vaccination	1.Yes 2. No	
50	Vitamin A	1. Yes 2. No	
51	Has your child had the measles disease	1.Yes 2. No	
52	Are there any other factors that make it difficult to get the second dose	1.Vaccine not available Unaware of need for immunization Unaware of need to return for second dose. Place and/or time of immunization unknown Fear of side effects Wrong ideas about contraindications Place of immunization too far Vaccinator absent Time of immunization inconvenient . Mother too busy . Family problem, including illness of Mother . Child ill . Long waiting time . Postponed until another time . No trust in immunization . Cultural/ religious reasons	

MCV2 questionnaire, Amharic Version

ቃለመጠይቃዊ ስምምነት ቅፅ

ጤና ይስጥልኝ! እንዴት አደሩ/ዋሉ!

የእኔ ስም _____ ነው።

በአሶሳ ዞን ወረዳዎች እና ቀበሌዎች የኩፍኝ ክትባት ሁለተኛው ዶዝ አጠቃቀም እና ተያያዥ ምክንያቶች ጥናት ላይ መረጃ እየሰበሰብኩ ነው። ለጥናቱ መረጃ ለመስጠት ያቀረብኩትን ግብዣ ስለተቀበሉ ላመሰግነዎት እወዳለሁ። የዚህ ጥናት ግኝት በአሶሳ ዞን እና በቤኒሻንጉል ጉሙዝ ክልል ለክትባት አገልግሎት ማሻሻያ ይውላል። ስለኩፍኝ ክትባት ሁለተኛ ዶዝ አጠቃቀም እና ተያያዥ ምክንያቶች መረጃውን እጠይቀዎታለሁ።

ስለዚህ እርሰዎ በዚህ ጥናት ላይ ለመሳተፍ ተመርጠዋል። ለምጠይቀዎት ጥያቄዎች መልሶቹ በኮድ ስለሚያዙ የጥናቱ ሂደት በሚስጥር የሚጠበቅ ይሆናል። በተጨማሪም ከተመራማሪው ውጭ ለሶስተኛ ወገን አይደርስም። ይህ ጥናት በእርሰዎ እና በቤተሰብዎ እንዲሁም በማህበረሰቡ ላይ የሚያደርሰው ጉዳት እንደሌለው ላረጋግጥለዎት እወዳለሁ። ማንኛውም ዓይነት ጥያቄ ካለዎት ምቾት እንዲሰማዎት ያድርጉ። ስሜተዎንም ይግለጹ። በዚህ ጥናት ላለመሳተፍ ከመረጡ ወይም ከቃለ-መጠይቁ ለመውጣት ከፈለጉ በማንኛውም ጊዜ ለማቆም መብት አለዎት።

መረጃውን በትክክል ተረድተዋል? ማንኛውም ዓይነት ጥያቄ ካለዎት በማንኛውም ጊዜ መጠየቅ ይችላሉ። መልሱንም እንሰጠዎታለን። ከላይ ከተገለጹት ጉዳዮች ጋር የተያያዙ ጥያቄዎችን በመመለስ ከእኔ ጋር ለሚያደርጉት ቆይታ አመሰግናለሁ። ቃለ-መጠይቁ በግምት 30 ደቂቃ ይወስዳል።

በዚህ ጥናት ለመሳተፍ ይስማማሉ? እስማማሁ_____ አሌስማማም _____

የመጠይቁ መለያ ቁጥር _____ ቃለ መጠይቁን ያደረገው ስም_____ ፊርማ_____

መጠይቅ ቅፁ የተሞላበት ቀን_____ መጠይቁን ለመሙላት

የተጀመረበት ሰዓት _____ ያበቃበት ሰዓት_____

የተቆጣጣሪው ስም_____ ፊርማ_____

ቃለ መጠይቅ ሀ :- ማህበራዊና ስነ ህዝባዊ ገጽታዎች

(እባክዎ ትክክለኛዉን መልስ በ ባዶ ሳጥኑ ዉስጥ ምልክት ያድርጉ)

Table 3 Questionnaires of Amharic Version

ተ.ቁ	ጥያቄ	አማራጭ መልሶች	ምርመራ
1	የእናት እድሜ	ዓመት _____	
2	የህፃኑ/ኗ እድሜ	ወር _____	
3	የህፃኑ/ኗ ፆታ	1.ሴት 2. ወንድ	
4	የመኖሪያ አካባቢ	1.ከተማ 2. ገጠር	
5	የእናት የጋብቻ ሁኔታ	ያላገባች/ባ 2. ያገባች/ባ 3. የተለያዩ 4. ተለያይተው የሚኖሩ 5. የሞተባት/በት	
6	የእናት የትምህርት ደረጃ	ማንበብና መጻፍ የማትችል 3. አንደኛ ደረጃ ሁለተኛ ደረጃ 4. ኮሌጅና ከዛ በላይ	
7	የእናት የእምነት ሁኔታ	ሙስሊም 2. ኦርቶዶክስ ፕሮስቴንታንት	
8	የእናት/የአባት የስራ ሁኔታ	የቤት እመቤት 2. ገበሬ 3. የቀን ሰራተኛ ነጋዴ 5. የመንግስት ተቀጣሪ ሌላ (ይገለጽ…….)	
9	ብሔረሰብ	1.በርታ 2. አማራ 3. ኦሮሞ 4. ሺናሻ 5. ጉሙዝ	
10	የቤተሰብ የወር ገቢ	_____ ብር	
11	የቤተሰብ ብዛት	1.1-3 2.4-5 3. 6 እና ከዛ በላይ	
12	ከ5 አመት በታች ያሉ ህጻናት ብዛት	_____	

ክፍል 2. በአሶሳ ዞን ስር በሚገኙ ወረዳዎች ለሚደረግ የኩፍኝ ክትባት ሁለተኛ ዶዝ አጠቃቀም ጥናት ላይ የጽንስ፣ ግብዓት አቅርቦት እና ተደራሽነት ጋር ተያያዥነት ያላቸው ጥያቄዎች

ተ. ቁ	ጥያቄ	አማራጭ መልሶች	ምርመራ
13	በአካባቢው የክትባት አገልግሎት አለ?	አዎ 2. የለም	
14	በአካባቢው ያለው የክትባት ጣቢያ ምን አይነት ነዉ?	ቋሚ ውሎ ገብ ውሎ አዳር	
15	የክትባት አገልግሎት መስጫ ቦታው ስንት ኪ.ሜትር ይርቃል?	ከ5 ኪ.ሜ በታች ከ5 ኪ.ሜ በላይ	
16	ወደ ጤና ተቋም ከደረሱ በኋላ አገልግሎት ለማግኘት ምን ያህል ደቂቃ ይቆያሉ	_____	
17	በእርግዝናሽ ጊዜ ቅድመ-ወሊድ አገልግሎት ወስደሽ ነበር?	አዎ 2. አይ	
18	ልጅሽን የት ነበር የወለድሽው?	በቤት ውስጥ 2. በጤና ተቋም	
19	የድህር-ወሊድ አገልግሎት ነበረሽ?	አዎ 2. አይ	

ክፍል 3. በአሶሳ ዞን ስር በሚገኙ ወረዳዎች ለሚደረግ የኩፍኝ ክትባት ሁለተኛ ዶዝ አጠቃቀም ጥናት ላይ የእውቀት፣ አመለካከት እና ትግበራ ጥያቄዎች፡

ተ.ቁ	ጥያቄ	አማራጭ መልስ	ምር መራ
	የዕውቀት ጥያቄዎች		
20	ስለ ኩፍኝ ክትባት ሰምተዉ ያውቃሉ?	አዎ 2. አይ	
21	ስለ ኩፍኝ ክትባት ጥቅም ያዉቃሉ?	አዎ 2. አይ	
22	**ህጻናት የኩፍኝ ክትባትን መቼ መቼ መዉሰድ እንዳለባቸዉ ያዉቃሉ?**	አዎ 2. አይ	
23	**ህጻናት ስንት ግዜ የኩፍኝ ክትባት መዉሰድ እንዳለባቸዉ ያወቃሉ?**	1.አዎ 2. አይ	
24	ጥያቄ ቁጥር 23, አዎ ከሆነ ስንት ግዜ ይወስዳሉ	1.አንድ 2. ሁለት 3. ሶስት 4. አላዉቅም	

25	**ህጻናት የመጀመሪያዉ ዙር የኩፍኝ ክትባት በስንተኛዉ ወር እንደሚከተቡ ያዉቃሉ?**	1.አዎ 2. አይ	
26	ጥያቄ ቁጥር 25 አዎ ከሆነ, በስንተኛዉ ወር ይወስዳሉ?	**1**.በ9 ወር **2.** ከ15 እሰከ 24 ወር **3**. እንደተወለዱ 4. አላዉቅም 5. ሌላ ካለ የጠቀስ	
27	**ህጻናት የሁለተኛ ዙር የኩፍኝ ክትባት በስንተኛዉ ወር እንደሚወሰድ ያዉቃሉ?**	**1**.አዎ **2**. አይ	
28	ጥያቄ ቁ. 27 አዎ ከሆነ በስንተኛዉ ወር ይወስዳሉ?	1.በ9 ወር 2. ከ15 እሰከ 24 ወር 3. እንደተወለዱ 4. አላዉቅም 5. ሌላ ካለ የጠቀስ	
29	ስለ ክትባት የጎንዮሽ ጉዳት ያዉቃሉ?	አዎ 2. አይ	
30	ስለ ኩፍኝ በሽታ ያወቃሉ?	1. አዎ 2. አይ	
	የአመለካከት ጥያቄዎች		
31	የኩፍኝ በሽታ በጣም ከባድና ገዳይ ነዉ ብለዉ ያስባሉ	1.እስማማለሁ 2. አልስማማም	
32	የኩፍኝ ክትባት ህጻናትን ከኩፍኝ በሽታ ይከላከላል ብለህ/ሽ	1. እስማማለሁ 2. አልስማማም	
33	ክትባት የመከተቢያ ክፍለ-ግዜን ማወቅ ተገቢ ነዉ ብለው ያስባሉ	እስማማለሁ 2. አልስማማም	
34	የኩፍኝ ክትባት ህጻናትን ህመም ያመጣባቸዋል ብለዉ ያስባሉ?	እስማማለሁ 2. አልስማማም	
35	የክትባት አስፈላጊነትን እንዴት ታስባለህ/ሽ?	1. እስማማለሁ 2. አልስማማም	
36	ህፃናት የሚወስዷቸው የክትባት ዓይነቶች ይበዛሉ ብለው ያሰባሉን?	እስማማለሁ 2. አልስማማም	
37	ሁሉም ህፃናት ክትባት ማገኘት አለባቸው ብለው ያስባሉ?	እስማማለሁ 2. አልስማማም	
38	ሌሎች ህፃናት ክትባት እንዲያገኙ / እንዲወስዱ መክረው/አበረታተዉ ያዉቃሉ?	እስማማለሁ 2 አልስማማም	
	የተግባር ጥያቄዎች		
39	ልጆዎት ሁለተኛዉን ኩፍኝ ክትባት ወሰዶዋል/ች	1. አዎ 2. አይ	
40	ጥያቄ ቁ.40 አዎ ከሆነ በስንተኛዉ ወር ወስደ?	1.ከ15-18 ወር 2. ከ18-24 ወር	
41	ጥያቄ ቁ.40 አይ ከሆነ፣ ያልተከተበበት/ችበት ምክንያት ምንድነዉ ?	1. የክትባት እጥረት ስለነበር 2. ስለክትባቱ አስፈላጊነት ግንዛቤ አለመኖር 3. ለሁለተኛው የኩፍኝ ክትባት መመለስ እንዳለብኝ ግንዛቤ ባለመኖሩ 4. የክትባት መስጫው ቦታና ሰዓቱ ባለማወቁ 5. የክትባት ጎንዮሽ ገዳቶችን ፍራቻ 6. ስለክትባቱ የተሳሳተ መረጃ ስለነበረኝ 7. የክትባት መስጫ ቦታው በጣም መራቅ 8. ካታቢው/ዋ ስላልነበሩ 9. የክትባት ጊዜ የማይመች ስለሆነ 10. እናት ሥራ ስለበዛባት 11. የቤተሰብ ችግር እንዲሁም የእናት መታመም 12. ህፃኑ/ኗ መታመም 13. በክትባት ጣቢያ ስለሚያቆዩ 14. የክትባት መርሃ-ግብሩ ለሌላ ጊዜ በመዛወር 15. በክትባቱ ላይ ምንም እምነት ስለለ 16. በባህልና የሃይማኖት ተጽኖ	
42	ህጻኑ የኩፍኝ ክትባት ሳያገኝ ተመልሶ ያዉቃል?	አዎ 2. አይ	
43	ስለ ኩፍኝ ክትባት ምን አይነት መረጃ ስምተዋል?	1.ስለ ክትባት ጥቅም 2.ስለ ክትባት መርሃ-ግብ 3.የክትባት የጎንዮሽ ጉዳት 4. ስለበሽታዉ አደገኝነት 5.ሌላ ካለ ይግለጹ----------	
44	ስለኩፍኝ ክትባት መረጃዉን ከየት ሰሙ?	1.ከጤና ባለሙያ/ኤክስቴሽን 2.የጤና ልማት ሰራዊት 3.ሬድዮ 4.ቴሌቪይን 5.ከጎረቤት	

ክፍል 4. በአሶሳ ዞን ስር በሚገኙ ወረዳዎች ለሚደረግ የኩፍኝ ክትባት ሁለተኛ ዶዝ አጠቃቀም ጥናት ላይ ሌሎች መደበኛ ክትባቶች የክትባት ሁኔታ ጥያቄዎች፡

ተ/ቁ	የክትባት አይነቶች	የክትባት ሁኔታ
45	የህጻኑ ክትባት ካርድ አለ	አዎ 2. አይ
46	ልጅዎት በስንተኛዉ ወር/ቀን ነዉ ክትባት የጀመረዉ	1.እንደተወለደ/ች 2. ከተወለደ ከ2 ሳምንት ቦኃላ 3. በ45ኛዉ ቀን 4. ሌላ ካለ ይጠቀስ _____
47	ፖሊዮ 0	1.አዎ 2. አይ
48	ቢሲጂ	1.አዎ 2. አይ
49	የ ቢሲጂ ጠባሳ	1.አዎ 2. አይ
450	ፖሊዮ 3	1.አዎ 2. አይ
551	ፔንታ3	1.አዎ 2. አይ
52	ክትባት ጨርሶዋል	1.አዎ 2. አይ
53	ቫይታሚን A ወስደዋል	1. አዎ 2. አይ
54	ህጻኑ/ኗ የኩፍኝ በሽታ [illegible]	1.አዎ 2. አይ
55	ሁለተኛውን መጠን ለማግኘት አስቸጋሪ የሚያደርጉ ሌሎች ምክንያቶች አሉ	1. የክትባት ጊዜ አይማይመች 2. እናት ሥራ ስለበዛባት 3. የእናት መታመም ባለመኖሩ 4. ህፃኑ/ኗ መታመም 5. በክትባት ጣቢያ ያቆያሉ 6. የክትባት መርሃ-ግብሩ ለሌላ ጊዜ በመዛወር 7. በክትባቱ ላይ ምንም እምነት የለኝም 8. በባህልና የሃይማኖት ተጽኖ አለ 9. የክትባት እጥረት ስለነበር 10. ስለክትባቱ አስፈላጊነት ግንዛቤ አለመኖር 11. ለሁለተኛው የኩፍኝ ክትባት መመለስ እንዳለብኝ ግንዛቤ 12. የክትባት መስጫው ቦታና ሰዓቱ ባለማወቄ 13. የክትባት ጎንዮሽ ገዳቶችን ፍራቻ 14. ስለክትባቱ የተሳሳተ መረጃ ነበረኝ 15. የክትባት መስጫ ቦታው በጣም መራቅ 1 6. ካታቢው/ዋ ብዙን ግዜ አይኖሩም