

BMJ Open Behavioural and social drivers of immunisation among zero dose children in pastoralist communities of Ethiopia: a qualitative study

Menen Tsegaw Biadigln ^{1,2}, Nardos Gelana,² Eshetu Girma,³ Finina Abebe ⁴, Hnin Su Mon,⁵ Yordanos Tadesse ⁶, Melkamu Ayalew Kokebie,⁷ Tseganesh Gedlu,⁷ Hanna Alemayehu,⁷ Tesfaye Bikes,⁷ Yeshiwork Eshetu,⁷ Mesfin Kasaye,⁷ Adugna Endale,⁵ Rachana Sharma,⁵ Hiwot Getachew⁵

To cite: Biadigln MT, Gelana N, Girma E, *et al.* Behavioural and social drivers of immunisation among zero dose children in pastoralist communities of Ethiopia: a qualitative study. *BMJ Open* 2025;**15**:e105253. doi:10.1136/bmjopen-2025-105253

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<https://doi.org/10.1136/bmjopen-2025-105253>).

Received 17 May 2025

Accepted 06 November 2025

ABSTRACT

Background Immunisation is one of the most valuable, impactful and cost-effective public health interventions which delivers positive health, social and economic benefits. Globally, 4 million deaths worldwide are prevented by childhood vaccination every year. In Ethiopia, despite huge progress being made, the routine immunisation coverage has never reached the targeted figures and planned goals. Pastoralist communities are often disproportionately under-vaccinated, and there is often a confluence of interrelated factors that drive this outcome. This study enables us to identify factors affecting immunisation service utilisation in the pastoralist communities of Ethiopia, which helps to design effective and context-specific interventions.

Objective This study aims to explore the behavioural and social drivers (BeSDs) of routine immunisation among the communities with high numbers of zero-dose and under-immunised children in Afar, Somali and Gambella regions of Ethiopia.

Methods A qualitative exploratory study was conducted in three selected regions of Ethiopia (Gambella, Somali and Afar) from 9 November 2023 to 30 December 2023. Purposive sampling was used. A total of 33 interviews were conducted in the three regions. Sample size was determined based on idea saturation. Data was collected using interview guides. The interview guide was developed after reviewing relevant literature, desk review and using the journey to health and immunisation framework. A separate interview guide was developed for the journey mapping exercise, in-depth interview, healthcare workers discussion guide, focus group discussion and observation. Data was analysed thematically.

Results Behavioural (lack of awareness, lack of reminder/forgetting, misperception about vaccines, negative previous experience, lost card and fear of post-vaccination adverse events).

Structural (language barrier, long distance from home to facility, high cost of transportation, long waiting time, limited training of healthcare professionals and incentives, inconvenient service hours, shortage of health professionals, disrespect by the healthcare provider), Socio-cultural (competing priorities, low community

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study explored an important public health issue in underserved populations.
- ⇒ The study used native speakers for data collection to better understand local discourses.
- ⇒ Explored the perspectives of fathers or male caregivers during the focus group discussion activity.
- ⇒ The journey mapping activity involved mothers only.
- ⇒ Not generalisable to all pastoralist communities in Ethiopia.

engagement, lack of decision-making autonomy, limited husband involvement, workload, rural residence and larger family size were the commonly mentioned barriers to routine immunisation uptake. On the other hand, structural (house to house visit by health extension workers, counselling about adverse events, presence of outreach service, affordability (free of charge)), behavioural and socio-cultural (knowledge of adverse event management, and respect from community) were enablers to routine immunisation service uptake in pastoralist communities.

Conclusions The study found several individual and contextual factors affecting routine immunisation uptake in pastoralist communities. Context-specific and tailored interventions which address zero dose drivers should be designed so as to enhance vaccine uptake. The findings suggested the need to design context-specific interventions to address the aforementioned barriers to immunisation.

INTRODUCTION

Immunisation is one of the most valuable, impactful and cost-effective public health interventions which delivers positive health, social and economic benefits.¹ Globally, 4 million deaths worldwide are prevented by childhood vaccination every year, and it's estimated that over 50 million deaths can be prevented by immunisation from 2021 to 2030.² In Ethiopia, despite huge progress



© Author(s) (or their employer(s)) 2025. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ Group.

For numbered affiliations see end of article.

Correspondence to

Menen Tsegaw Biadigln;
menentsegaw@gmail.com

made so far, the routine immunisation coverage has never reached its goals and intended outcomes. According to the Ethiopian mini demographic and health survey 2019, only 44 per cent of children aged 12–23 months have received all basic vaccination (fully vaccinated) and about 19 per cent of children have not received vaccinations at all.³ The prevalence of zero-dose children in the underserved settings of Ethiopia was 33.7%.⁴ Caregivers' socioeconomic situation and behavioural factors such as knowledge about vaccines, self-efficacy, beliefs and social norms influence routine immunisation service utilisation.^{5 6}

Marginalised populations, including internally displaced persons, refugees, migrants, urban slum area dwellers, those of rural remote inhabitants and pastoralists, often remain disproportionately under-vaccinated, and there is often a confluence of interrelated factors that drive this outcome. For example, evidence suggests that under-vaccination can be linked to geography-related barriers, transient movement due to nomadic lifestyles, inadequate or lack of inclusive vaccination systems, and insecurities due to wars and conflicts, among others. These communities must not be deprived of vaccines because 'none of us is truly safe until we are all safe'.⁷ In response, the Ethiopian Ministry of Health (MOH), in collaboration with its partners, including UNICEF, has been actively working to overcome barriers to immunisation access, demand and uptake among the underserved communities. The evidence and insights generated from this study will be used for informing and influencing immunisation policies and practices in reducing zero dose immunisation among most marginalised community members. Therefore, this study aimed to explore the behavioural and social drivers of routine immunisation service uptake in pastoralist communities of Ethiopia.

METHODS AND MATERIALS

Study approach and context

A qualitative exploratory study was conducted in three selected regions of Ethiopia: Gambella, Somali and Afar from 9 November 2023 to 30 December 2023. Those three regions were selected based on their number of zero dose under-five children and are pastoralist communities. Pastoralist communities are people whose livelihood

relies on herding domestic animals like cattle, goats and sheep and moving to different places to find water and food for their animals. The study conducted in pastoralist communities of Gambella, Somali and Afar regions of Ethiopia, which has a high number of zero-dose and under-immunised children. Districts or woredas in each region were selected based on their zero dose level. The selection was done in consultation with UNICEF and MOH, Ethiopia.

Inclusion criteria

Caregivers with children under 5 years eligible for vaccination were included.

Participant selection

Purposive sampling was used to get rich information about the experiences of caregivers (fathers and mothers) in relation to routine childhood immunisation service utilisation. Health extension workers (HEWs) working on immunisation and those caregivers having under-immunised under-five children were involved in the journey mapping activity. A total of 33 interviews were conducted in the three regions (table 1). Caregivers were selected by field facilitators together with the local HEW support. Healthcare Workers (HCWs) were selected based on their experience in providing routine childhood immunisation service. Sample size was determined based on idea saturation.

Data collection tools

Data was collected using interview guides (attached as an online supplemental file 1). The interview guide was developed after reviewing relevant literature, desk review and using the human-centred design (HCD), particularly the journey mapping framework. The guides were developed in a way to answer the research questions and study aims. We conducted a journey mapping exercise as part of the HCD approach. A journey mapping framework was selected to understand the barriers and enablers of routine childhood immunisation at different steps of their journey. Identification of stage-based determinants will help to design and inform stepwise interventions to address the challenges faced by caregivers. In addition, the use of journey mapping activity together with the classical

Table 1 Total number of interviews conducted in each region for each type of participant and data collection methods

Region	FGD with caregivers (mothers and fathers)	IDI (with mothers)	Observation (with mothers)	Journey mapping	
				Caregivers (mothers)	HEWs
Afar	2	6	2	1	1
Gambella	2	3	1	1	1
Somali	2	7	2	1	1
Total number of interviews	6	16	5	3	3
FGD, Focus Group Discussion; HEWs, Health Extension Workers; IDI, In-depth Interview.					

qualitative interview helps to get a deeper understanding of the problem. The mapping activity is also important to empower the participants by giving them the chance to post their barriers and enablers on the sticky note. The interview guides were validated with the stakeholders working on immunisation and with data collectors. Before starting the actual data collection, the interview guides were role played with the data collectors so as to ensure clarity, cultural sensitivity, gender inclusivity and acceptability of questions. After this validation, the interview guides were modified. Data collectors were experienced in qualitative data collection and transcription. The data collectors were recruited purposively by using snowball sampling. To ensure they are experienced in qualitative interviewing, they were requested to provide their sample transcription that they had done for their previous employer and a 2 days training was also provided for them. Two data collectors and one field supervisor were assigned to each region. Data from the in-depth interview (IDI), journey mapping, observation and Focus Group Discussions (FGDs) were thematised and triangulated.

A separate interview guide or tool was developed for the journey mapping exercise, IDI, HCW discussion guide, focus group discussion (FGD guide attached as an online supplemental file 2) and observation. The observation was conducted to observe the daily routines, preparatory issues, decision-making process, service experience and follow-up related issues (observation checklist attached as an online supplemental file 3). IDI and FGDs were conducted to explore individual and group insights about the barriers and facilitators to routine childhood immunisation. A journey mapping exercise was conducted among HEWs and caregivers separately. We conducted two journey mappings (one with caregivers and one with HEWs) in each region. The study tools were translated into Nuer and Amharic languages. Due to financial constraints, we were unable to translate the tools to the other two languages (Afar and Somali). All consent forms were translated into Somali, Afar and Nuer languages. A validation workshop on the study tools was conducted with stakeholders and the national immunisation Communication and Community Engagement technical working group (C-TWG) at Addis Ababa. After the validation workshop, the study tools were modified with the focus of reviewing the content, understandability, coherence, cultural acceptability and relevance before the actual data collection.

Data processing and analysis

The audio recordings from the IDI, FGD and observation were thoroughly transcribed. Additionally, the findings from the journey mapping activity were documented using both sticky notes and audio recordings. Audio records from the FGD, HCWs discussion guide, journey mapping and IDI were translated into English. Field notes were taken during the interview and observation.

All the interview transcripts have been read and reread to have a thorough understanding of the data set. Translated data was coded using OPEN CODE software V.4.03. After the data was finalised and translated, thematic analysis was conducted. The data was collected using the local languages Afar, Somali and Nuer. Native speakers of each local language were hired as data collectors. Transcription was also made by those local data collectors. To ensure the quality of the transcribed data, the project team evaluated the transcriptions on a daily basis and provided feedback to transcribers. Based on the research questions and interview guides, a codebook was initially developed by MTB, NG and FA and it was validated by all authors in this manuscript. Emerging codes were also added during the coding process. Coding was done by MTB, NG and FA. The coding process used both deductive and inductive approaches. Preliminary codes and themes were defined deductively based on the research questions, and additional codes that emerged during the analysis were added inductively. The investigators generated codes and categorised them into broader themes. The preliminary results were then reviewed by the research team, and agreements were reached to ensure alignment with the research objectives and scientific plausibility. Finally, the findings were presented in narrative form, incorporating relevant quotes to support the themes. The results were presented and analysed regionally.

Data quality assurance

To ensure the quality of the data, various quality assurance techniques were employed before, during and after the data collection process. Before data collection, the research tool was validated with stakeholders, and modifications were made accordingly. Training was provided to the data collectors, field facilitators and supervisors to ensure a common understanding and clarify any ambiguities. During data collection, the research team provided supportive supervision, conducted daily debriefings, documented challenges and successes, and maintained frequent contact with the data collectors to effectively monitor the process. During the analysis phase, the research team evaluated the accurate representation of the study's findings and ideas by reviewing the transcribed files. To increase the credibility of the findings, the team triangulated the collected data. Additionally, the analysed data and final textual findings were discussed with experienced public health researchers in qualitative data analysis and reporting to check consistency.

Patient and public involvement

None.

RESULTS

Sociodemographic characteristics

Participants with various sociodemographic characteristics were involved in IDIs, FGDs and observations. The majority of the participants were Muslim religion followers, married and mothers (table 2).

Table 2 Sociodemographic characteristics of participants who were involved in in-depth interviews, focus group discussions and observation in Gambella, Afar and Somali region, Ethiopia, 2023

Region	FGD		IDI (with mothers) female	Observation (with mothers)	Journey mapping	
	Female	Male			Caregivers (female caregivers)	HCWs
Afar	1 FGD comprising of 8 mothers	1 FGD with 8 fathers	8 – 6 –	2	1 journey mapping activity with 7 mothers	1 journey mapping activity with 2 male and 3 female HCWs
Somali	1 FGD comprising 8 mothers	1 FGD with 6 fathers	7	2	8	1 journey mapping activity with 4 male and 2 female HCWs
Gambella	1 FGD comprising 8 mothers	1 FGD with 6 fathers	3	1	8	1 journey mapping activity with 2 male and 4 female HCWs
Total number of interviews=	6 FGDs		16 IDIs	5 observations	6 journey mappings	

FGD, focus group discussion; HCWs, healthcare workers; IDI, in-depth interview.

Theme 1: caregivers' knowledge, decision-making and preparation for routine vaccination

This theme included decision making, knowledge, self-efficacy and preparation for routine vaccination. This theme summarises daily activities performed by the mothers and means of communication and family size they are using during the day of observation. This theme explores caregivers' knowledge about vaccination, their decision-making process and their self-efficacy in preparing for vaccination day.

The mothers who participated in the IDI in the Afar region stated that the children are said to be fully vaccinated when they take the whole vaccine until the age of 9 months. They received a card which showed their completion of routine immunisation or fully vaccinated their child. After taking the completion card, they did not come for taking nutritional supplements like Vitamin A and deworming. The mothers perceived those vaccines as important in preventing diseases like polio and measles.

...Children who complete vaccination will have the ability to protect themselves from various diseases, which is of great benefit to their health. (IDI 1, mother, Afar)

...Vaccination has many benefits. we have been able to prevent measles and other diseases by vaccination. (IDI 3, mother, Afar)

The IDIs in the Gambella region found that the mothers were aware of the benefits of the vaccines in preventing diseases. They also said that the vaccination schedule continues till 9 months and beyond.

...Child immunisation means taking child to the vaccination place until 9 months of Age and after. It promotes child health and prevents a disease. (IDI1, Gambella)

Generally, the findings in Somali and Gambella showed that being busy was the main barrier to remembering the appointment date to immunisation. The mothers in Gambella also reported having a large number of children as a great challenge to remember the date.

...Has many children and cannot come to the health facility because of the amount of work she has to do at home for her children and it is not convenient to bring them to a health facility. (P3, p1, mothers, FGD2, Afar)

The mothers in Somalia mentioned that lack of knowledge of their husband was their main challenge to immunisation. Most of the participants in Gambella stated that the mother lost the card since she put the child's card on the table and left it at home. They suggested the mother had to go to the health facility and tell the whole scenario to the health professionals, then she could vaccinate her child. The mother FGD participants in the Afar region mentioned that due to having many children, lack of time and being busy with doing household chores, the mother could not vaccinate her children.

...There is no regular transport service in our kebele, but if a Bajaj transport is available, we will have to pay 100 Birr to go to the health facility for one round, many mothers unable to pay for transportation. (P3, mothers, FGD2, Afar)

...Yes, there are many caregivers, who were absent due to the transportation problem. (P5, mothers, FGD1, Gambella)

Most mothers in the Somali region reported that they knew about the benefits of the vaccine. The vaccines could prevent various diseases like measles, influenza and others. They also perceived that vaccines reduce the severity of other diseases. Even common colds affect unvaccinated children more than vaccinated ones. The child was supposed to be fully vaccinated when he/she gets vaccinated until the age of 9 months. They did not consider nutritional supplements as part of the routine immunisation schedule.

...When vaccinating your child, they will be healthy. Vaccines have a lot of benefits. For instance, those who are unvaccinated will sick, but those who are vaccinated are not, they will not be severely sick. (IDI 6, mother, Somali)

...It is good for the health and it prevents the polio and many diseases. The vaccinated child has more immunity than the unvaccinated. (IDI 1, mother, Somali)

In the Afar region, the decision was made by the husband. In the Afar region, women have no role in deciding the vaccination fate of the child. However, in most of the cases, the husbands were not resistant. If a husband refused, then he would be advised by the elders and leaders. In the case of the Somali region, only one participant mentioned that the decision was made by her; otherwise, the decision was made by the husband. The findings in Somali and Afar regions showed that long waiting times and noise due to the children crying were the main things that happened after they arrived at the health facilities.

...It is my husband who makes the decision to vaccinate the children. (IDI2, mother, Afar)

The observation finding from the Afar and Somali region showed that most of the family members start their day by the Morning Prayer. The majority of the observation findings in the Afar region showed that before going to the health facility, the mothers' main activities were finding/securing someone who would take care of the children who would stay at home during the vaccination day of her little child, and informing their husbands about their journey to the health facility and the reason for their visit which was vaccinating children. Past negative experience was a barrier for mothers in the Somali region. This finding was supported by the IDI findings.

...On the day of the vaccination service, I wake up early in the morning, prepare food for my family, have breakfast and finish other household chores and finally take my child to the health centre. (IDI 1, mothers, Afar)

The Dagu system was the main source of information in the Afar region, indicating that traditional network or communication system was the most effective and commonly used means of communication. In the same way, in the Somali region, the mothers get information

about vaccination from their neighbours, friends and other women who came to the health facility to vaccinate their children. Somali and Afar regions used interpersonal communication. Regarding preparation, all the activities taken before going to vaccination were similar across regions. That is, all mothers wash their children, change clothes and find someone who will take care of children who stayed at home during the day of vaccination. However, the mothers in Gambella gave due emphasis on finding the vaccination card. In both Somali and Afar regions, the observation findings showed that lack of infrastructure and transportation was a major challenge for the mothers to vaccinate their children.

Theme 2: routine immunisation service experience

This theme included the codes good memorable events and bad memorable events about routine childhood immunisation. This theme included the evolution of attitudes and vaccination status of the children.

One participant in the Somali region mentioned that the injection site scar was the worst memorable event associated with vaccination. Unlike vaccines that are administered orally, injectable vaccines were more painful and sometimes resulted in body changes like swelling and scarring. The mothers thought that the scar or swelling was due to the freezing of the vaccine inside the child's body.

...That would be, there are times when the vaccine freezes (inside the body) and when it does, it causes swelling and the place of the injection becomes depressed. It becomes a scar. (IDI 1, mother, Somali)

Theme 3: influencers on vaccination practice

Explore the most important or significant person or influencer within the community. This includes trusted individuals in the community and reasons why they are trusted within the community.

Generally speaking, almost all FGD participants in Afar, Gambella and Somali region mentioned that the elders, religious leaders and government/kebele leaders were the most significant part of the community in their woreda. In addition, youths were mentioned as influencers in the Afar region. HEWs were the most important personnel in the Gambella region. Neighbours were the most significant part of the community in the Somali region.

Almost all father FGD participants in the Afar region mentioned that the elders, religious leaders and government/kebele leaders were the most respected and significant part of the community in their woreda. Their main reason was due to the fact that elders have more life experience and they are wiser in solving community problems. The elders are also used as a traditional legal system to solve conflict and reconcile people before things get worse, and the people always accept their decision as well as advice without any hesitation. Some also mentioned that the youths are great influencers in addition to elders and leaders. They perceived that youths

are knowledgeable and productive in influencing other community members.

...The Afar people are mainly governed under three bodies: elders, religious leaders and government leaders. (P7, fathers, FGD 1, Afar)

Most mother FGD participants in the Afar region stated that religious leaders, tribal/clan leaders and health professionals were the most influential part of the community in their area. The tribal leaders, especially women representatives, were highly accepted by the community due to their great work in promoting maternal and child health. No one could refuse the decision of the elders, clan and religious leaders.

Regarding the health issue in our area, health professionals are responsible for ensuring that the community receives various health services properly... (P5, mothers, FGD 2, Afar)

...In addition, the tribal leader performs various tasks on social issues, and there is a women's representative who works on women and children's issues. (P7, mothers, FGD 2, Afar)

The mothers participated in the FGD in the Gambella region, which showed that HEWs and healthcare providers in general were the most important people within their community. The health professionals get the credibility because of their continued counselling and teaching the mothers about important health issues. The HEWs were used as important cues to the mother about the vaccination appointment date. They were highly engaged with the mothers and counselled them about vaccination. The HEWs were the most proximal enablers to enhance immunisation service utilisation. Some participants stated that seasonal variation influenced their acceptance of the advice given by the health professionals, especially during the summer season when they were busy doing other routine activities rather than going to a health facility. Father participants also mentioned elders, kebele and religious leaders were influencers within the community. They believe those are important persons and are experienced enough in solving various social problems.

He is an important person in our kebele and he is a health professional, he always advises and counsels us about vaccination, nutritional and early treatment seeking behavior for the child... (P3, mothers, FGD 1, Gambella)

...A HEW is an important person in our kebele and because when every child missed the vaccine, she even come/goes home and tells you that why, your child missed the vaccine and remind you about vaccine date and the importance. (P5, mothers, FGD 1, Gambella)

The findings in the FGD of the Somali region showed that neighbours, religious leaders and government security bodies were the most important personnel within their community. They ask for help from their neighbours when they face a problem. Religious leaders taught

them about the right path and spiritual philosophies. Government bodies or leaders helped to maintain peace and security of the community.

...The most important ones are the security workers and religious leaders. They are important because religious clerks teach the Quran, and leaders maintain peace and security. (P2, mothers, FGD 2, Somali)

The findings in the Somali and Afar regions showed that the mothers trusted healthcare professionals (HCPs). Their previous attitude towards vaccines was negative, but their current attitude changed due to the counselling effect of healthcare providers, especially the home-to-home visit of the HEWs. The finding in the Afar region showed that few mothers fully vaccinate their children due to their high level of awareness about the benefits of the vaccine in preventing diseases. On the other hand, mothers in the Somali region mentioned residing in rural areas as the main barrier to fully vaccinate children. Although urban areas were stated as enablers to easily access immunisation service, the location of the house from the main road was also another issue. Thus, living near to the main road (Asphalt) was mentioned as a barrier due to fear of car accident. That is, the mothers were afraid of car accidents to their children who would stay at home when she was going to the health facility. This was secondary to not having someone who can take care of other children who stayed at home during the vaccination date.

...Because previously residents did not understand the benefits of the vaccine and they refused to bring their children to the health facility, so when the health workers tried to go door to door to provide vaccination services. (IDI 4, mother, Afar)

Theme 4: vaccination service delivery-related factors

This theme included the codes at point of care, waiting time, experience of care and counselling about side effects. This theme included community engagement, transportation/opportunity cost, confirmation bias and social norms.

Lack of transportation and lack of money for transportation were identified as common barriers to Afar, Somali and Gambella.

...There are very few people who have access to transportation services, and most of our kebele community does not have access to transportation services because of this there are many children who missed vaccination. (P6, fathers, FGD1, Afar)

...Yes, there are many caregivers, who were absent due to the transportation problem. (P5, mothers, FGD1, Gambella)

The majority of the fathers' FGD findings in the Afar region showed that the fathers were not involved in community awareness creation campaigns or programmes. Some participants said that they had been involved in certain community education programmes

and they had got a lot of information about the vaccine schedule and benefits.

...Health professionals gather various stakeholders in our kebele, such as kebele leaders, clan leaders, women and other groups, and give us education about vaccination... (p7, FGD1, Afar)

Mothers FGD conducted in the Afar region found that the mothers were engaged in the community education programme. They had obtained a health education programme about vaccine benefits and vaccination in general. Those health education programmes about vaccination were mostly targeted at mothers. Those health education programmes were mainly focused on telling the mothers about the importance of the vaccine in preventing diseases and the participants remembered this key message among a couple of messages.

...Experts have been teaching about hygiene and hygiene at different times regarding vaccination, they teach us that we should prevent our children before they get sick. (p2, mothers, FGD2, Afar)

...Health professionals teach us at different times that we should vaccinate our children to protect them from various diseases. (p7, fathers, FGD1, Afar)

The majority of mothers in the FGD in the Gambella region showed that they had not participated in community engagement activities. However, some participants mentioned that they had heard about the vaccine through religious leaders. Religious leaders played a crucial role in disseminating health information for mothers who attend the spiritual ceremony. Mothers accepted and easily remembered messages transmitted by those spiritual leaders. Religious organisations and their leaders have paramount importance in educating the mothers about vaccination services.

...I did not participate in community engagement activity. (P3, mothers, FGD1, Gambella)

No I did not participate. I simply hear the vaccine announcement during church service... (P6, mothers, FGD1, Gambella)

Fathers FGD participants in the Gambella region mentioned that they have been involved in a community dialogue programme held in their town. The main content of the dialogue was about COVID-19 vaccine uptake among the town's population. During the campaign, they have been told about the importance of COVID-19 vaccine. Unlike the fathers, the mothers remember a health message about childhood vaccination, which implied that mothers are more focused on child vaccination while fathers focus on their health by giving less attention to routine childhood immunisation.

...I participated last year in community dialogue at Kuergeng town. (P2, fathers, FGD2, Gambella)

All fathers FGD in the Afar region reported that the health workers treated their clients in a respectful manner. However, the waiting area was not convenient for the mothers. The fathers also share their idea about how their wives are treated in the health facility; this indicated that the mothers are the ones who always took the children to the vaccination site.

...Health workers treat people in respectful manner when they come to the health facility to vaccinate their children, but the lack of seating to wait in line therefore, mothers are sitting in uncomfortable places. (P1, fathers, FGD1, Afar)

In the Gambella region, some of the findings of the FGD with mothers found that there was no disrespectful or maltreatment practice during their experience and others' experience. Some HCWs were treating the mothers in a good and welcoming manner when the mother went both for immunisation and other medical services. However, most mothers reported that they had faced disrespect or abuse and witnessed while others were treated in the same unethical way.

Overall, community engagement was low in all regions, especially with regard to routine childhood immunisation. Unlike the mothers who participated in FGD in the Afar region, the majority of the fathers in the Afar region were not involved in community awareness creation campaigns or programmes. Unlike mothers in Afar, the majority of mothers in the Gambella region had not participated in community engagement activities. However, some mother participants in the Gambella region mentioned that they have heard about the vaccine through religious leaders. As compared with fathers in the Afar region, fathers in the Gambella region had been involved in the community dialogue programme held in their town. The findings reported in Gambella, Somali and Afar showed that lack of transportation, lack of money for transportation and longer distance from home to a health facility was their main barrier in accessing immunisation services. In addition, conflict or war was the other hindering factor in the Afar region. In the Afar region, the HCWs were caring, respectful and compassionate, thus the mothers had not faced any abuse or mistreatment. Except for the uncomfortableness of the waiting area, the mothers had no complaints. However, in the Gambella region, most of the mothers reported the experience of mistreatment and abuse by healthcare providers. There was a gap in Compassionate and Respectful Care (CRC) skill of health professionals in the Gambella region.

...I have not been involved in discussions or awareness creation session about vaccination. (p1, FGD1, Afar)

...No I did not participate in any community education program. I simply hear the vaccine announcement during church service. (P6, mothers, FGD1, Gambella)

Theme 5: after vaccination event, rumours and misinformation about vaccines

This theme included forgotten vaccination appointment/vaccination appointment reminder, lost card, and experience and management of adverse events and rumours and misinformation about the vaccine.

The finding in Somali and Afar showed that fever and crying were the most common events that happened after vaccination. The mothers in the Afar region tied clothes on the injection site to relieve pain; however, the mothers in the Somali region used paracetamol suppository. On the other hand, counselling about the next appointment and post-vaccination precaution measures was the most common post-vaccination event in Gambella region. The healthcare providers told the mothers not to wash the child soon after vaccination.

Overall, the findings from Somali, Gambella and Afar showed that fever, minor swelling and crying were the most common side effects that occurred after vaccination and they considered those symptoms as normal parts of vaccination. Unlike participants in the Gambella region (who said no sex differentiation in terms of side effect severity), most of the participants in the Afar region said that the severity of side effects was worse among the girls than the boys.

...I think it is due to the vaccine because every child after vaccination, he/she always cries during whole day and also might develop fever. Vaccine had no sex differentiation; it is the same in both sexes. (P3, mothers, FGD1, Gambella)

...Fever and crying after vaccination are normal, so mothers know that children will be fine after 2 or 3 days. (P8, fathers, FGD1, Afar)

From the mothers and fathers FGD in Gambella, it was reported that older people and those with no formal education were more resistant to vaccinate their children. Because they believed that the vaccine would make the child sick and cry the whole day. Some members of the community believed that the vaccines are killers and they could result in child death. Due to this reason, most of the people refused to vaccinate their children.

...There is negative rumor of vaccine and they said it cause illness to the children. I hear these messages in the community circulate it. (P2, mothers, FGD1, Gambella)

...I hear these messages from old age and uneducated people spread to the communities because after vaccination child may have extensively cry and sometime child might develop fever. (P5, fathers, FGD2, Gambella)

Almost all of the IDI mother participants in the Afar region said that excessive crying and fever were the events that happened soon after the vaccination. The children cried a lot and they spent the whole day taking care of the child. It was the mothers' responsibility to be with the child and use different mechanisms to stop crying. The mothers used a cloth which was tied on the injection site

to relieve the pain of the child. Cloth tying was typically used for injectable vaccines.

...To stop them from crying, when I return home, I tie a piece of cloth to a piece of wood and swing it to make them forget the pain and fall asleep right away. (IDI2, mothers, Afar)

The IDI in Gambella reported that the HCWs wrote the next appointment date and counselled about post-vaccination precautions. They were told about not to wash the child soon after the vaccination.

... I was given next appointment which was written in the card and HCWs told me not to bath the child following vaccination. (IDI1, mother, Gambella)

Most study findings in the Somali region showed that fever was the most common post-vaccine adverse effect. The mothers used paracetamol suppositories to relieve fever. Fever, injection site pain and swelling were considered as a sign of vaccine functionality or onset of action in the blood stream. They recommended other mothers not to be afraid of those symptoms as they existed for a short period of time; they should vaccinate their children.

...After the vaccine is given, if they develop fever, you administer suppository and you will be taking care of them patiently as you are the only one who will until he/she gets better. (IDI 1, mother, Somali)

A journey mapping exercise was conducted with HEWs and caregivers. Various barriers and enablers were identified at the six steps of the journey to routine immunisation. The barriers and enablers found at each step were behavioural, social and structural determinants affecting immunisation service utilisation. The findings obtained through the journey mapping framework were also found through IDI, FGDs and observation. There was also a high similarity of the findings across the three regions, showing that pastoralist communities had many common structural and behavioural barriers. This highlighted the consistency of the findings across different data collection methods and regions (table 3).

DISCUSSIONS

This study explored the barriers and enablers to immunisation among caregivers in pastoralist communities of Afar, Somali and Gambella region, Ethiopia. This study also explored the perspective of HCWs regarding immunisation to address the major health facility or healthcare level factors which can either hinder or enable immunisation service provision by the health system and utilisation by caregivers. The identified barriers and enablers encompassed the various types of behavioural, socio-cultural and structural determinants to routine childhood immunisation. Hence, lack of awareness, lack of training of HCPs, lack of incentives, competing priority, inconvenient service hour, language barrier, community mobility, low community engagement, lack of decision-making autonomy, lack of transportation, longer distance

Table 3 Summary of journey mapping findings (Afar, Somali and Gambella)

Steps of journey mapping	Barriers	Enablers
Knowledge, attitude and belief Caregivers	▶ Lack of awareness ▶ Giving priority to traditional medicine	▶ Receiving health education and counselling ▶ Dagu system (Afar)
HCWs	▶ Lack of vaccine-related training ▶ Lack of trained staff	▶ Close follow-up from regional health bureau ▶ Experienced staff and good IPC ▶ Community trust in vaccine
Intent Caregivers	▶ Realising that it is not against the culture and religion ▶ Outreach service in hard-to-reach area	▶ Not knowing the date of vaccination ▶ Lack of money for transportation and workload ▶ Lack of vaccine service in the area ▶ Low women's decision-making power
HEWs	▶ Lack of incentives ▶ Less linkage between health centre and health post ▶ Workload and service interruption	▶ Access and availability of vaccine supply ▶ Adequacy of vaccine supply ▶ Partner support
Preparation Caregivers	▶ Lack of transportation ▶ Forgetting appointment date ▶ Competing priority	▶ Health workers' good approach ▶ Having residents near to health facility ▶ Vaccination service given freely ▶ Provision of outreach service
HEWs	▶ Unconducive environment ▶ Lack of transportation for outreach	▶ Doing outreach jointly with others ▶ Having prepared session plan every month ▶ Having enough Expanded Program on Immunization (EPI) register
At point of care Caregivers	▶ Not convenient time ▶ Long queue ▶ Interruption of vaccination service	▶ Availability of outreach service ▶ Living near to health facility ▶ Having vaccination card
HEWs	▶ Staff turnover ▶ Lack of waiting room ▶ Lack of vaccinators ▶ Community mobility	▶ Availability of static vaccine at health centre ▶ Having solar refrigerator ▶ Availability of EPI card ▶ Availability of static EPI schedule
At experience of care Caregivers	▶ Language barrier ▶ Side effect ▶ Absence of interpreter	▶ Health workers' respect for client ▶ Community satisfied by the service ▶ Trust in vaccinators ▶ Experienced health workers in the area ▶ Vaccination service is free from any payment ▶ Presence of vaccinators who speak local language ▶ Clan leaders and kebele administration support
HEWs	▶ Missing vaccination card ▶ Inadequate number of vaccination days (once a week) ▶ Vaccination room is narrow	▶ Client satisfied with the service ▶ Community trust and respect for health workers ▶ Vaccination service provided by female health workers
After service Caregivers	▶ Side effects and rumours ▶ Mothers reluctant to next vaccination	▶ Good attitude ▶ Cultural acceptance
HEWs	▶ Skill gap ▶ Language barrier ▶ Residence in hard-to-reach areas	▶ Good attitude for EPI ▶ Acceptance by community influencers

HCWs, healthcare workers; HEWs, health extension workers.

from home to facility, lack of money for transportation, lack of husband involvement, long waiting time, workload, rural residence, shortage of health professionals,

poor Interpersonal Communication (IPC)/disrespect, lost card, larger family size, lack of reminder/forgetting. Misperception about vaccines, negative previous

experience and fear of post-vaccination adverse events were the commonly mentioned barriers to routine immunisation uptake. This finding is consistent with the study finding conducted in Ethiopia among underserved populations, by which the study identified those factors as the major barriers hindering marginalised communities from using immunisation services.⁸ This finding was also supported by the findings from Bangladesh, by which health workforce shortages and lack of access to transportation were the main barriers to immunisation.⁹ Another supportive evidence was also reported in Nigeria, in which proximity of facilities with vaccines and vaccinators and awareness about immunisation including safety, importance and schedules was the main barrier to vaccine uptake.¹⁰ A qualitative study conducted in Cameroon also reported similar findings in which long distance, infrastructural problems, low community engagement, fear of post-vaccination fever and rumours were the main challenges for vaccination uptake.¹¹ This implies the consistency of those hindering factors across time and populations, signalling the need for designing context-specific interventions to address those deep-rooted barriers so as to increase routine childhood immunisation service utilisation among pastoralist communities.

On the other hand, house-to-house visits by HEWs, counselling about adverse events, knowledge of adverse event management, presence of outreach service, affordability (free of charge) and respect/support from community to health workers were enablers to routine immunisation service uptake in pastoralist communities. Supporting the HCWs is an important enabling factor to enhance routine immunisation service provision, and this is supported by the finding in India.¹² Although free accessibility of immunisation services is mentioned as an enabler, inability to get the services at any time and pace was a big challenge. This was supported by a finding reported in Nairobi, Kenya.¹³ This implies the need to ensure the availability and accessibility of health facilities to caregivers at their own pace, and the service should be affordable as well. Integration of the public health facilities to private health facilities may also help to reduce such inconveniences.

CONCLUSION

The study found several social and behavioural barriers and enablers to routine immunisation uptake among pastoralist communities of Afar, Somali and Gambella region. Lack of awareness, lack of training of HCPs, lack of incentives, competing priority, inconvenient service hour, language barrier, community mobility, low community engagement, lack of decision-making autonomy, lack of transportation, longer distance from home to facility, lack of money for transportation, lack of husband involvement, long waiting time, workload, rural residence, shortage of health professionals, poor IPC/disrespect, lost card, larger family size, lack of reminder/forgetting misperception about vaccines, negative previous experience and

fear of post-vaccination adverse events were the commonly mentioned barriers to routine immunisation uptake. On the other hand, house-to-house visits by HEWs, counselling about adverse events, knowledge of adverse event management, presence of outreach service, affordability (free of charge) and respect from the community were enablers to routine immunisation service uptake in pastoralist communities. The findings suggested that proper interpersonal communication, including counselling should be provided for caregivers by addressing the basic immunisation messages and addressing concerns/questions raised by caregivers. Strengthening husband/male engagement in child-caring practices including vaccination. Providing recognition and certification to caregivers who fully vaccinated all of their children. Enhance community outreach, home-to-home vaccination services, while engaging communities' participation in primary healthcare programme including immunisation services. Defaulter tracing needs to be systematised and contextualised including setting up community-based reminders for caregivers. Enhance the capacity of HCWs to improve knowledge and skills in interacting with caregivers on immunisation services. Regular and refreshment IPC training should be provided for HEWs. Strengthen immunisation record/registration flow to address challenges related to card room issues.

Author affiliations

¹School of Rural Health, Monash University, Warragul, Victoria, Australia

²Department of Public Health, Ambo University, Ambo, Ethiopia

³African Population and Health Research Centre, Nairobi, Kenya

⁴Clinton Health Access Initiative (CHAI), Addis Ababa, Ethiopia

⁵United Nations Children's Fund (UNICEF), Addis Ababa, Ethiopia

⁶School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

⁷Ethiopia Ministry of Health, Addis Ababa, Ethiopia

Acknowledgements We would like to thank UNICEF Ethiopia for its financial support and for providing the opportunity to carry out this project. We are also pleased to thank the Ministry of Health, Ethiopia, Gambella regional health bureau, Somali regional health bureau and Afar regional health bureau for facilitating and providing support letters to conduct the study. Finally, we are glad to thank the study participants, data collectors and field facilitators for their time and contribution to this work.

Contributors EG, HSM, AE, RS, HG, YT and FA contributed to the conception and design of the project. MTB was involved in the acquisition of data, analysis and interpretation of data. MTB, FA and NG were also involved in the supervision of the project. MTB contributed to data analysis, visualisation and wrote the draft manuscript. All authors participated in revising the draft manuscript, agreed to submit to the current journal, gave final approval of the version to be published and agreed to be accountable for all aspects of the work. As a guarantor, MTB accepted full responsibility for the work and/or the conduct of the study, had access to the data and controlled the decision to publish.

Funding This study was part of a UNICEF-funded study project in Ethiopia. The funders had no impact on the design, collection, management, analysis and interpretation of the data; and preparation, review or approval of the manuscript.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Ethical Clearance Committee of the Ethiopian Public Health Association (EPHA) Institutional Review Board (reference number: EPHA/OG/902/23). A support letter

was obtained from the Ministry of Health (MOH) and the respective regional and city administration health offices. After the purpose and objective of the study were informed, written informed consent was obtained from each study participant. Written informed consent was also obtained from the participants to take a picture. All participants were informed that participation was on a voluntary basis and they could withdraw from the study at any time if they were not comfortable with the questions. The data were collected and analysed anonymously by removing personal identifiers from the data in order to maintain confidentiality. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Menen Tsegaw Biadigln <https://orcid.org/0000-0003-2226-1669>

Finina Abebe <https://orcid.org/0000-0003-0465-1831>

Yordanos Tadesse <https://orcid.org/0000-0003-4541-7654>

REFERENCES

- 1 Rémy V, Zöllner Y, Heckmann U. Vaccination: the cornerstone of an efficient healthcare system. *Journal of Market Access & Health Policy* 2015;3:27041.
- 2 Prevention. Prevention, c. for d. c. and. fast facts on global immunization. 2022.
- 3 ICF. Ethiopia Mini Demographic and Health Survey 2019, 2021. Available: <https://www.dhsprogram.com/pubs/pdf/FR363/FR363.pdf>
- 4 Bikis GA, Shiferie F, Tsegaye DA, *et al.* High prevalence of zero-dose children in underserved and special setting populations in Ethiopia using a generalize estimating equation and concentration index analysis. *BMC Public Health* 2024;24:592.
- 5 Ozigbu CE, Olatosi B, Li Z, *et al.* Correlates of Zero-Dose Vaccination Status among Children Aged 12-59 Months in Sub-Saharan Africa: A Multilevel Analysis of Individual and Contextual Factors. *Vaccines (Basel)* 2022;10:1052.
- 6 Galadima AN, Zulkefli NAM, Said SM, *et al.* Factors influencing childhood immunisation uptake in Africa: a systematic review. *BMC Public Health* 2021;21:1475.
- 7 Lucero-Prisco DE III, Adebisi YA, Uzairue LI, *et al.* Ensuring access to COVID-19 vaccines among marginalised populations in Africa. *Public Health (Fairfax)* 2021;197:e14-5.
- 8 Bikis GA, Shiferie F, Tsegaye DA, *et al.* In-depth reasons for the high proportion of zero-dose children in underserved populations of Ethiopia: Results from a qualitative study. *Vaccine: X* 2024;16:100454.
- 9 Jannat Z, Das H, Ali MW, *et al.* Identifying the zero-dose and under-immunized children in Bangladesh: Approaches and experiences. *PLoS One* 2024;19:e0312171.
- 10 Mahachi K, Kessels J, Boateng K, *et al.* Zero- or missed-dose children in Nigeria: Contributing factors and interventions to overcome immunization service delivery challenges. *Vaccine (Auckl)* 2022;40:5433-44.
- 11 Saidu Y, Mattei PD, Sangwe Clovis N, *et al.* In-depth reasons for the high proportion of zero-dose children in a remote rural district in cameroon: a qualitative study. *Public Health and Healthcare* [Preprint] 2023.
- 12 Patel K, Nayak B, Rana S, *et al.* Enablers and barriers towards ensuring routine immunization services during the COVID-19 pandemic: findings from a qualitative study across five different states in India. *Trans R Soc Trop Med Hyg* 2022;116:trac011:814-21.
- 13 Gichuki J, Ngoye B, Wafula F. "I'll take them another day": A qualitative study exploring the socio-behavioral complexities of childhood vaccination in urban poor settlements. *PLoS One* 2024;19:e0303215.