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Factors Influencing Health Extension Programme impact on institutional delivery in the rural part of Ethiopia

By Biniyam Geremew Jebesa



58th Master of Public Health/International Course in Health Development

**KIT (Royal Tropical Institute)
Vrije Universiteit Amsterdam (VU)**

Factors influencing health extension programme impact on institutional delivery in the rural part of Ethiopia

A thesis submitted in partial fulfilment of the requirement for the degree of
Master of Science in Public Health

by
Biniyam Geremew Jebesa

Declaration:

Where other people's work has been used (from either a printed or virtual source, or any other source), this has been carefully acknowledged and referenced in accordance with academic requirements.

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58th Master of Public Health/International Course in Health Development (MPH/ICHD)
13 September 2021 – 2 September 2022
KIT (Royal Tropical Institute)/Vrije Universiteit Amsterdam
Amsterdam, The Netherlands

September 2022

Organised by:
KIT (Royal Tropical Institute)
Amsterdam, The Netherlands

In cooperation with:

Vrije Universiteit Amsterdam (VU)
Amsterdam, The Netherlands

Abstract

Introduction - The Ethiopian health extension programme (HEP) provides primary health care services for the community through health extension workers (HEWs) based in health posts (HPs) at the community level. HEWs have extensive roles in providing maternal health care, including uncomplicated delivery services and facilitation of referrals. Despite this, the prevalence of home delivery is high and consequently, the maternal mortality rate is also high. This review analysed factors that hinder and facilitate HEP's contribution to promoting institutional delivery.

Method - Peer-reviewed and grey literatures were searched in various online libraries (Cochrane, VU, PubMed/Medline, Google scholar, Ethiopian university research repository, and Hinari). Articles in the English language since the initiation of the HEP (2003) to date which focused on the study topic were incorporated. Data were classified, analysed, and discussed using the community health worker performance measurement framework.

Results – Facilitating factors were an adequate provision of basic medical equipment and supplies and on-the-job training for HEWs. In addition, HEWs get assistance from the community in their maternal health tasks and the community is generally satisfied with the HEP. Barriers were related to inadequate skills and knowledge of HEWs to raise awareness about and provide delivery services, lack of infrastructure of HPs, cultural practices and beliefs, and long distances to health facilities. Gaps in preservice training and supportive supervision contribute to low HEW motivation and job satisfaction.

Discussion – The contribution of the HEP in increasing institutional delivery is affected by multiple interlinked health systems, community, and contextual factors. The government of Ethiopia must increase the budget for the program to improve the capacity of the HEWs and HPs and expand the program coverage.

Key terms – health extension program, antenatal care, institutional delivery, service utilization, Ethiopia.

Word count – 11,210

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Abbreviations

ANC – Antenatal care

BEmONC – Basic emergency obstetric and new-born care

CBHI – Community based health insurance

CHW – Community health worker

CMR – Child mortality rate

DHO – District health office

EDHS – Ethiopian demographic health survey

EMDHS – Ethiopian mini demographic health survey

FMoH – Federal Ministry of Health

GDP – Gross domestic product

GPA – Grade point average

HEP – Health extension program

HEW - Health extension worker

HMIS – Health management information system

HP – Health post

LMIC – Low- and middle-income countries

MDG – Millennium development goal

MMR – Maternal mortality rate

MWH – Maternity waiting house

PHC – Primary health care

PHCU – Primary health care unit

PNC – Postnatal care

PPH – Postpartum haemorrhage

PWF – Pregnant women forum

RHB – Regional health bureau

SDG – Sustainable development goal

TBA – Traditional birth attendant

THE – Total health expenditure

UN – United nation's

UNICEF – United nations international children's fund

VU – Vrije University

WHO – World Health Organization

Key Terms

Maternal death – Any death of a female caused by pregnancy management or aggravated by the pregnancy or during delivery, (except accident or incident during pregnancy) or within 42 days of termination of pregnancy irrespective of the site or duration (1).

Maternal health service – A women’s health service during pregnancy, giving birth, and during the postnatal period (WHO).

Completion of Continuum of care (CoC): It is defined by the completion of all recommended ANC visits (at least 4 ANC), institutional delivery, and PNC services (2).

Institutional delivery – A birth that takes place in a health facility where skilled providers are available, and the delivery is assisted by these providers (3).

Acknowledgment

First and foremost, my deepest gratitude to my Almighty God for blessing me with this beautiful life and opportunities. Secondly my family for supporting me in every bit of my journey.

I am extremely grateful to the Netherlands government for giving me the opportunity to attend this program through the orange knowledge program scholarship.

I would like to extend my deepest appreciation to my thesis advisor for supporting and guiding me in completing this work.

Finally, I am very thankful to my academic advisor, course coordinators, and all KIT (Royal Tropical Institute) staff for giving me the knowledge and skills throughout the year to accomplish this paper.

Introduction

According to the World Health Organization (WHO), community health workers (CHWs) are community members who are selected by the community, to receive short-term training to deliver basic primary health care (PHC) services, not necessarily part of the health system but supported by the system (4,5). In many low- and middle-income countries (LMICs) the introduction of CHWs fundamentally aimed to improve maternal and child health and prevent and respond to common infectious diseases in a setting of scarce resources, mainly for marginalized communities. Following the Alma-Ata declaration of health for all in 1978 (6), large-scale CHW programs were started by multiple developing countries such as Brazil, Indonesia, and Iran (4).

The existence of the community health work in Ethiopia goes back to the 1980s following the civil war. Three thousand CHWs were deployed by the government in the Tigray region after receiving training on maternal and child health, environmental health, and malaria diagnosis and treatment. The program got suspended in 1991 up until the end of the war, though various informal CHW programs with voluntary CHWs had been functioning since then. In 1998, the Ministry of Health developed the national health sector development program, which focused on engaging the health system more in preventive than curative services and giving more emphasis to the rural population, where 85% of the population resides (7). After five years, the program implementation review showed that there were still challenges in achieving equitable PHC coverage for most of the population and particularly the rural communities. PHC is defined according to WHO and UNICEF as “an approach to all communities to provide the highest possible level of health and wellbeing, equitably per the peoples need, starting from health promotion and disease prevention to treatment, rehabilitation and palliative care, as close and feasible as possible to community’s daily environment”(8). In response to the review and to also address the Alma-Ata declaration “Health for all”, through the PHC approach in a limited resource context, the HEP was launched as a formal part of the health system in 2003 in four agrarian regions of the country (5) and later to extend to the whole of Ethiopia.

In the past two decades in Ethiopia, maternal health service use has increased significantly. The antenatal care (ANC) coverage from 28% in 2005 to 74% in 2019, institutional delivery from 5% in 2005 to 33% in 2021. Maternal mortality reduced from 673 in 2005 to 412 per 100,000 live births in 2016 (9–13). For these health achievements, the introduction of HEP played an important role.

Even though maternal death is reduced in Ethiopia, it is unacceptably high which accounts for one-fourth of all reproductive-age women’s death (14) and it is a major public health problem. The country didn’t meet the millennium development goals (MDG) in this concern and it is far from achieving the sustainable development goal (SDG) which is a maternal mortality rate (MMR) of 70/100,000 live births. The high level of maternal death in Ethiopia is caused by preventable obstetric complications which are mainly attributed to the high prevalence of home delivery. Maternal deaths have direct (obstetric complications) and indirect (existing diseases) cause. The common causes of maternal death in Ethiopia are postpartum haemorrhage (PPH), obstructed labour, pregnancy-induced hypertension, and unsafe abortion (14). These causes of death can be averted entirely with appropriate medical services, particularly institutional delivery.

The usage of the maternal health service continuum of care especially institutional delivery is found to be critical in averting MMR up to 71% in Ethiopia but if at least one service is missing the reduction rate will be 37% (2). In the rural part of Ethiopia, the ANC coverage which is found to be the most important determinant for using institutional delivery is 27% including mothers who took at least one follow-up for the last pregnancy (10). It indicates that the maternal health service coverage in the rural community is low, which aggravates the causes of maternal mortality. This review analyses factors that hinder and facilitate HEP's contribution to institutional delivery in Ethiopia, from grey and published literature between 2003 and 2022.

Background

Demographic data of Ethiopia

Ethiopia is the second most populous country in Africa and 12th in the world with a 115 million population in 2020 with 386,102 sq. miles of land area and an average of 115 per Km² of population density as shown in figure 1(15,16). Approximately half of the population is below the age of 15 (51.6%) as shown in figure 2 (17). Most of the population (78%) resides in the rural part in 2021 (18). Ethiopia has more than 80 ethnic groups with their language, culture, and heritage. There are multiple religions in the country predominantly two, the Ethiopian Orthodox Church and Muslims, accounting for 44% and 34% respectively (16).

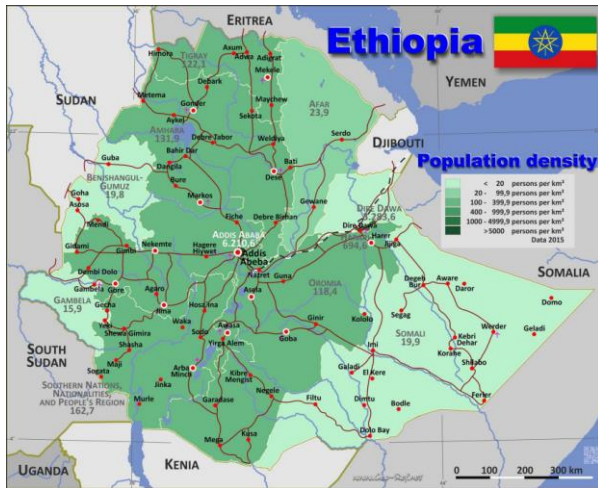


Figure 1: Ethiopian Map - Population density of Ethiopia

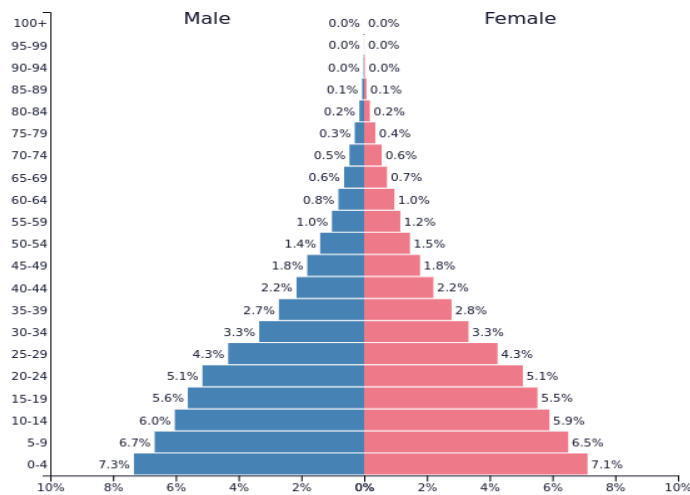


Figure 2: The 2021 Population pyramid of Ethiopia

Socio-economic situations

Ethiopia had one of the fastest growing economies for the past 15 years with a rate of 9.5% yearly growth. However, Ethiopia is the poorest with a gross national per capita income of \$890 compared to other countries with a fast-growing economies. In the past two years, Covid 19 and internal conflict have reduced the real gross domestic product (GDP). However, 70 % of the population (almost all rural) are employed in the agriculture industry which is not affected by Covid 19 and the contribution of agriculture to GDP in 2020/21 has slightly increased compared to previous years (15).

Climate change and severe weather are affecting the livelihood of pastoralists and food security by affecting the agriculture sector. The recent drought has affected approximately 7 million people from the southern and eastern parts, and it was the worst drought in the past 40 years (15). Concerning population wealth, while 62% of the wealthiest populations are concentrated in the urban, only 5% are living in rural areas as shown in figure 3 (10).

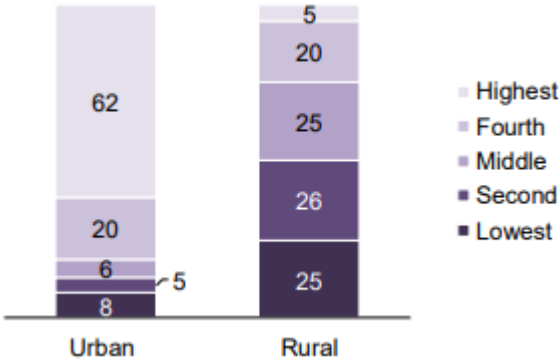


Figure 3: Household wealth by residency and percent distribution of the population by wealth quintile

According to the Ethiopian mini demographic health survey (EMDHS), in 2019 the national level of access to improved drinking water is 69%, 87% in urban, and 67% in rural areas. Electricity coverage is 35% nationally, 83% in urban, and 14% in rural areas. Urban resident females are more likely to attend school than rural residents. Forty-three percent of females aged 6 and older have never attended any education nationally, 30% in urban and 48% in rural areas. Two third of the reproductive age group women (15-49) are married or are living with their spouse. The average time between delivery is 35.5 months and shorter in women living in rural compared to urban areas. The median age of first child delivery is 18.7 years among women aged 25-49 (10).

Health care system

Ethiopia’s healthcare system has three tiers which are primary, secondary (general hospital which serves 1-1.5 million population), and tertiary (specialized hospital which serves 3.5-5 million population). The primary level consists of a district hospital, health centre, and health post serving 150,000, 25,000, and 5000 populations respectively, all linked by a referral network and also called the primary health care units (PHCUs) (19). The HEP is implemented primarily in health posts (HPs) staffed by one or two HEWs with weekly supervision of health centre staff. HEP operates at the village level ‘kebele’, which is the lowest level of government administrative structure in the country. Currently, the country has 17,587 HPs run by 40,000 HEWs (20).

The program started with 4,211 HPs and 2,737 health extension workers (HEWs who are CHWs) (20) and then expanded to other pastoralist regions in 2006, after which it expanded to urban areas in 2009 (21,22). The HEP provides major PHC-level preventive and curative health services for free to the community under four major health programs: hygiene and environmental sanitation, disease prevention and control, family health service, and health education and communication (23). HEWs are recruited within a vacancy announcement, all are women who completed grade tenth, and who are willing to go back to their village to work. They receive one year of basic training in technical and vocational training colleges (24).

Ethiopia have launched a community-based health insurance (CBHI) scheme in 2011 intending to reach a large proportion of the rural population and informal sector of the urban population. The scheme managed to cover 28% of the population nationally, 32% in the rural, and 19% of the urban area according to EMDHS 2019(10).

Problem statement, Justification, and Objectives

Problem Statement

The HEP is delivered for free at the HP in the community. The program started with 16 preventive and curative health packages, divided into four major health programs: -

- Hygiene and environmental sanitation (personal hygiene, healthy home environment, water supply, and safety measures, control of insects and rodents, food hygiene and safety measures, solid and liquid waste disposal, and excreta disposal).
- Disease prevention and control (malaria prevention and control, HIV/AIDS and Tuberculosis, first aid emergency services).
- Family health deals with maternal and child health such as (family planning, ANC, delivery, PNC, newborn care, deworming, nutrition, adolescent reproductive health, immunization); and
- Health education and communication (22,25)

Since 2010, the program has been adding curative services to the existing packages because of the general lack of human resources for health. Tasks have been shifted from higher-level cadres, such as nurses, to HEWs. This concerned under-five pneumonia, dysentery, intestinal parasites, and malnutrition treatment (26,27). The HEP has significantly contributed to the increasing the number of latrines, use of family planning, vaccination services, antenatal care (ANC), solid and liquid waste management, and malaria prevention and control, but had a limited contribution concerning increasing institutional delivery and postnatal care (PNC)(15,16).

Concerning maternal health HEWs are expected to provide antenatal care (ANC), intrapartum (uncomplicated delivery care), postnatal care (PNC), counselling at the HP or in the community, and referral to the health centre (30). In 2011, according to the Ethiopian demographic health survey (EDHS), ANC coverage (having two antenatal visits out of the four recommended by WHO standards) was 34% and institutional delivery care was 10%, and in 2016, ANC coverage was 62% and institutional delivery care was 26% (11,12), in 2019, 74% and 48% respectively (10). This improvement was a result of a combination of different factors such as the introduction of the HEP, increased community engagement and awareness, and improved socio-economic status of the population.

Community engagement is a key determinant of maternal health service utilization. HEWs have been forming a health development army (HDA) from the community and have also introduced the pregnant women forum (PWF). HDAs are voluntary members of the community who are model families that received training on HEP packages by HEWs and who adopted the practices and assist HEWs. The voluntary HDA leader is supposed to identify pregnant women in her village and refer them to the HPs. The PWF aims to give pregnancy-related health education and increase institutional delivery, it is facilitated by HEWs and a midwife from the catchment area (31).

For people living in rural and remote areas distance and poor transportation severely restrict access to delivery services provided at health facilities. To prevent pregnant mothers' delay in accessing the service, maternity waiting for houses (MWHs) have been introduced in the health centres mainly for the rural community. Mothers are expected to stay in the MWH for approximately 15 days before delivery. All services including shelter, food, water, and other basic needs are provided for free by the local government agency and through the contribution of the communities throughout their stay in the MWH. Despite this effort, most women are not using this service and they are giving birth at home. The utilization of various aspects of maternal health services is still low (32–34).

Studies suggest that there have been significant improvements in health outcomes in the era of the millennium development goals (MDGs) in Ethiopia. As maternal and child health is one of the HEP packages, the HEP has significantly contributed to the reduction of maternal and child mortality. The maternal mortality rate (MMR) went from 871, 673, 676 to 412/100,000 live births in 2000, 2005, 2011,

and 2021 respectively. The child mortality rate (CMR) went from 95, 91, 71, to 67/1000 live births in 2000, 2005, 2011, and 2021 respectively (32–34). This is due to improvements in the health system, expansion of primary health care units, the introduction of HEP, and the overall socio-economic growth of the country (35).

The maternal health service uptake from HPs is unbalanced (34). The reasons for this are beside the demand, also related to the supply side. Reasons for not providing maternal health services at the health post level include absence, delay, or deficiency in the provision of basic medical supplies to HPs lack HEW's skills, time, workload, and administrative or supervisory support. The majority of HEWs felt that the workload was too much and that they required more skill. In the 2020 national assessment of the HEP, about 75% of HEWs believed they were overloaded with assigned tasks. Moreover, 78.6% of HEWs claimed that the type of duties and responsibilities assigned to them requires more training than the training they had received (8,25)

The HEP by its nature should be an efficient intervention to address basic maternal health needs as it is rooted in communities and uses HEWs which are lower-cost cadres than other health workers to provide services. However, there is wide variation in HEWs' experiences, and more than half of HEWs feel that between 21 and 50% of their professional inputs were not utilized because of various constraints such as limited skills, high workload, the lack of infrastructure, supervision, and motivation (8,25)

HEWs are supposed to spend 75% of their time in the field conducting household visits as household visits have proven to increase a household's health service utilization (31,37). During this field visit, HEWs conduct awareness creation and give health education, identify pregnant mothers, refer them to the health centre for their first ANC visit and provide ANC from the 2nd visit at home or in the HP, and provide immunization information for families with unimmunized children, etc. However, only 51% of households had ever received a visit from HEW, out of this only 31% of households got a visit in 2018 (7,8,25)

Justification

Even though the country has reduced the maternal mortality rate, Ethiopia is among the sub-Saharan countries with the highest MMR. To address this, institutional delivery is crucial for reducing intrapartum and postpartum complications which lead to maternal and new-born death (38). More than 51% of mothers in 2019 (10) gave birth at home with a high prevalence (adjusted odds ratio of 6.48) in rural communities (39). This home delivery rate increased to 67% in 2021 (9). PNC prevents 30 -60% of neonatal mortality (40) though a high number of mothers do not receive a postpartum check-up (32). The main factors identified for this low uptake of the service are low socio-economic status and distance (34). However, free maternal health services are available at the health facilities starting from the health post in the village to hospitals which implies that other factors influence service utilization and require more investigation.

HEW's salary payment accounts for 21% of government recurrent total health expenditure (THE) and 32% of district recurrent THE (41). Ethiopia invests half a billion-dollar yearly in the HEP which accounts for 7% of the THE budget (20). Even though the country is spending this amount no study assessed the factors that limited the contributions of the program toward improving institutional delivery. Systematically assessing factors influencing the program's contribution to improving institutional delivery will enable us to identify and promote good practice and address the challenges the program is facing. This will in turn enable the country to efficiently use the limited resources the country has.

Reduction of maternal mortality ratio to 70/100,000 live birth, with no country above 140/100,000 live births is one of the SDGs, which needs to be achieved by 2030. Ethiopia with a MMR of 421/100,000 live birth in 2021 has a long way to go to achieve the goal (31). To reduce this rate rapidly, increasing institutional delivery is crucial. Understanding and addressing factors influencing the utilization of

freely available delivery services in every health facility including HPs is crucial in helping the country on the progress it is making in achieving the SDG. So far various studies have identified the above-mentioned general factors for the high prevalence of home delivery in the country, which should have been tackled with the HEP, but this did not take place. Therefore, an in-depth analysis of factors concerning the HEP is needed, because such an in-depth analysis would provide directions on how the HEP could be improved to address the problem of limited institutional delivery. Furthermore, there is no comprehensive study providing an overall overview of the problem in terms of HEP. Therefore, this study will help on reducing the gap by providing a comprehensive overview of the problem in terms of the HEP.

Objectives

General objective

Assess factors influencing health extension program contribution to the utilization of institutional delivery services in the rural part of Ethiopia to provide a recommendation to stakeholders and concerned bodies in order to strengthen the best practices and address constraining factors.

Specific Objectives

1. Explore what is known about HEWs competency and wellbeing in improving access and providing community-centred maternal health services (antenatal, counselling, referral, and delivery) at the health post and community level.
2. Explore factors related to health systems support that influence HEP performance in providing maternal health services (antenatal, counselling, referral, and delivery) at the health post and community level.
3. Explore factors related to community support that influence HEP performance in providing maternal health services (antenatal, counselling, referral, and delivery) at the health post and community level.
4. Investigate contextual factors that influence HEP performance in providing an antenatal, delivery, postnatal, referral, and counselling services.
5. Provide recommendations to policymakers, program implementers, and supporting organizations to strengthen the best practices and address constraining factors.

Methods

Search strategy, selection, and eligibility criteria of the studies

This study is done using the literature review method. Peer-reviewed and grey articles were searched in various online libraries such as Cochrane, VU, PubMed/Medline, Google scholar, Ethiopian university research repository, and Hinari using search terms (e.g., “health extension worker AND supervision AND antenatal care AND Ethiopia”). Extensive combinations used are presented in table 1. Government and non-government offices (federal ministry of health (FMoH), united nations (UN), WHO) policy and strategy publications were searched concerning HEWs and maternal health. Snowballing was also used from already selected articles up on reading. Articles were searched and identified by title then exclusion of non-relevant articles for this study was done by reading the abstract followed by reading the whole document. Articles from before the official launch of the HEP and articles not focussing on the study topic were excluded, all articles in the English language since the initiation of HEP (2003) to date which focused on the study topic as per the 1-4 specific objectives above were incorporated.

Table 1: Search terms with possible combination matrix for objectives 1-4.

Boolean operator	AND			
	Objective 1&2			
OR	Health extension worker, community health worker, health post, health extension program	Supervision, performance, appraisal, incentives, training, recruitment, data use, community support/engagement, HDA, health centre, district health office,	ANC, delivery, referral, counselling, health education,	Ethiopia, Africa, Sub-Saharan Africa, developing countries, rural
Objective 3				
OR	Health extension workers, community health workers, health post	motivation, job satisfaction, workload, attrition/retention, skills/knowledge, Perceived quality, use of service, knowledge of service availability, empowerment, experience of care, credibility/trust of HEW	ANC, delivery, referral, counselling, health education,	Ethiopia, Africa, Sub-Saharan Africa, developing countries, rural
Objective 4.				
OR	Rural community, pregnant mothers, reproductive age group, Health extension worker, community health worker, health post	Workload, pandemic, Gender, culture, norm, belief	ANC, delivery, referral, counselling, health education,	Ethiopia, Africa, Sub-Saharan Africa, developing country, rural

Process of study classification and analysis

Articles were classified, analysed, and discussed using the “community health worker performance measurement framework” (Figure 1). This framework is chosen because the programme's contribution towards increasing institutional delivery is directly related to the performance and factors influencing the performance of the HEWs. This framework was developed based on literature (42–52) and other

existing conceptual frameworks with the same objective, and expert consultations. It was developed to guide the governments and other agencies involved in CHW programs. The framework considers most domains starting from the system level such as governance and policy to community-level factors that influence the performance of CHWs. Furthermore, it is a recent framework that includes most of the domains the study is intended to investigate (53).

The CHW system is complex and interlinked to various areas. The framework is structured using four common categories – input, programmatic processes, community health system performance outputs, and outcomes; and recognizes contextual elements as well (bottom green). Sub-domains are listed under each main category. This study mainly focuses on two categories: community health system performance outputs (specific objective 1) and programmatic processes (specific objectives 2 and 3). Under the community health systems performance outputs, the existing status of HEWs’ competency and well-being, and community access and care concerning maternal health are discussed. Under the programmatic process, the thesis discusses community and health system support for the HEP. Health systems inputs are discussed under specific objective 2, as they are closely related to health system support towards HEWs. Also, other relevant findings are discussed under contextual factors (specific objective 4), such as socio-economic, cultural, belief, norm, and gender-related factors.

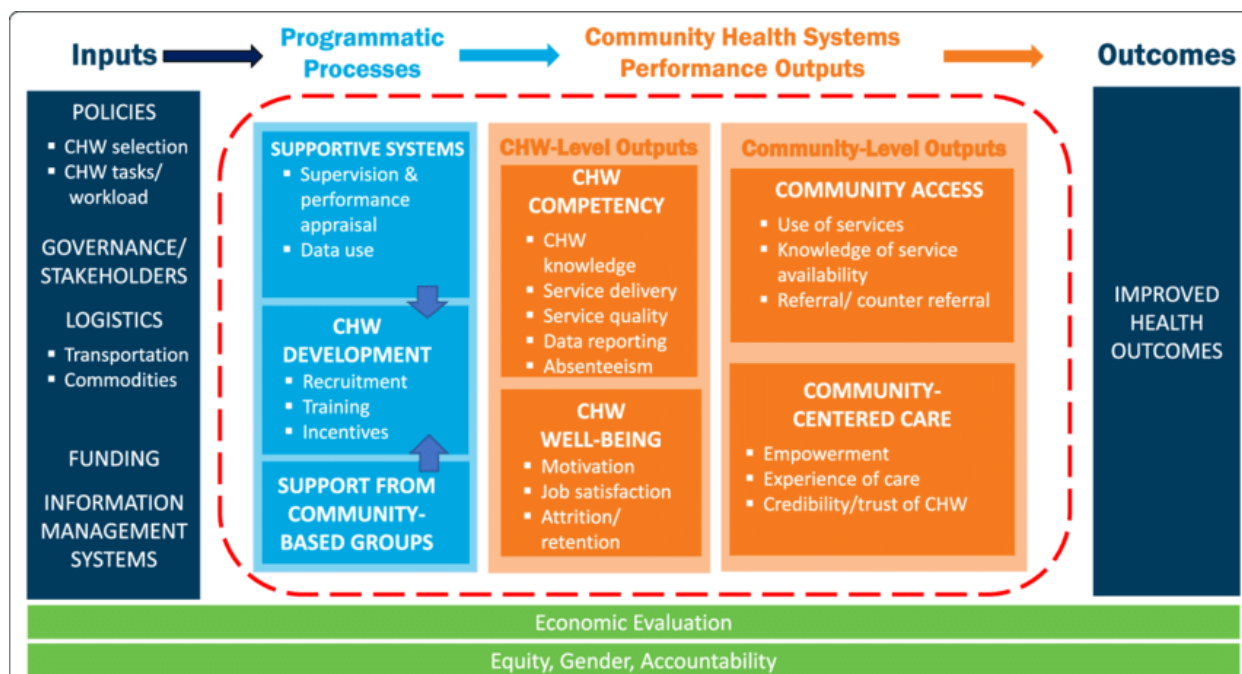


Figure 4: Agarwal 2019; community health worker performance measurement framework (53).

Limitations of the study

This literature review may be biased as it is conducted by one person and information about a different component of the framework might be more or less available in the existing literature. The studies included are of different types and methodologies with different study areas ranging from national to the district level. This could affect the generalizability of some of the findings. To make the used studies' findings clear to the reader study type and area are included in the text.

Results

Health extension workers' knowledge, skills, and competency

The maternal health services continuum of care mainly depends on the quality of the service (54). The FMoH recommends HEWs refer identified pregnant mothers for the first and last ANC follow-up to health centres and provide the in-between follow-up at HP or home of the women. However, despite this recommendation HEWs provide 1st ANC follow-up without having the capacity to provide the service. Even though most rural mothers use ANC services from HPs (55), HEWs provide ANC to one-third of mothers who ever got at least one ANC (mostly in the rural community (annex 3)) in HPs and at home (2,56). Among these, they only follow the standardized recommendation of ANC provision in terms of frequency and service components only for 18% of mothers according to the 2019 mini-DHS multilevel analysis (57,58). However, a study done on rural mothers to analyse the effect of 1st ANC follow-up place on the continuum of care revealed that the place of the 1st ANC follow-up either at HP or at other higher HF did not influence the women's adherence to the continuum of care (2).

The commonly influencing factor for using institutional delivery is the usage of ANC services either in a health facility or at home via HEW home visits (73,86,87). Discussion between pregnant mothers and HEWs on the benefit of using maternal health services facilitate maternal health service use in general (62) and discussion on birth plan and preparedness during ANC visits facilitate the usage of institutional delivery in particular (87). However, the HEWs knowledge of ANC counselling contents was found to be low in a survey done in the Amhara region. More than 50% of the HEWs did not know more than half of the ANC counselling content. Among the 25 ANC counselling contents, only three were known by above 80% of HEWs namely the importance of institutional delivery, taking iron folate, and taking an extra meal during pregnancy. The knowledge of danger signs and symptoms and complications during pregnancy was found to be poor. While vaginal discharge was the commonly known (>80%) danger sign and symptom, severe headache, and visual disturbance were not known by more than 50% of HEWs as danger signs and symptoms during pregnancy (59,60).

The HEP promotes institutional deliveries in health facilities including HPs, However, the number of deliveries conducted in HPs by HEWs is very minimal because of a lack of skills, experience, and confidence (61). According to EMDHS 2019 HEWs conducted only 4% of all births were attended by skilled attendants as shown in figure 5 and details are shown in annex 2 (10). Most (>50%) HEWs believe their skill in providing delivery service is limited because of a lack of practical training during their preservice one-year training, lack of on-the-job training, lack of supervision, and because they forgot their training by lack of practicing the skill for a long time (62). HEWs capacity to detect complications early during labour is found to be minimal (30). Except for HEWs self-perception of limited skills and knowledge of providing institutional delivery, there is no study done to assess this.

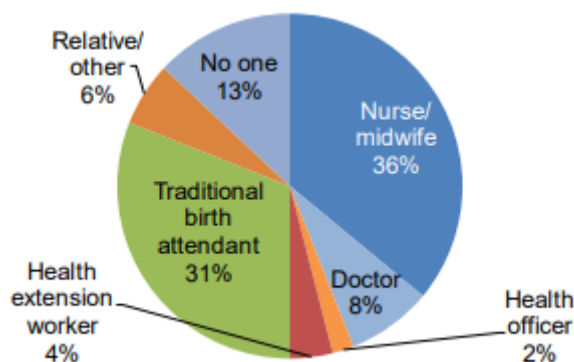


Figure 5: Percentage of births attended by different providers between 2014 to 2019 (10).

Different studies have revealed that HEWs are not providing delivery services because of a lack of skills, experience, confidence, and lack of trust by the community in their capability which leads the

community to bypass the level or use traditional birth attendants (TBAs) at home (61,63,64). Most HEWs admit that they are not providing delivery services because they consider the lack of water and electricity in the HPs as a great challenge to provide clean and safe delivery service (64).

The HEWs have low data management knowledge compared to the practice and these two skills are influenced by the availability of reporting formats, reference and registration books, and frequency of supervision (65). Even though the health management information system (HMIS) is reformed at all levels of the health care unit, HEWs still use a paper-based reporting system which is a challenge to provide a complete timely report to the health centre and district health office (25). However, the expansion of network coverage has brought a great opportunity to use 'mhealth' (66) even though many HEWs require training to use a mobile to provide a complete timely report (67).

Health extension workers are absent from work mainly because of either leave or training and if the HP has only one HEW it is closed until she returns (62). The availability of HEWs when pregnant mothers arrive at the HPs is a major determinant of the community's perception of quality of care (68).

HEWs well-being: motivation, job satisfaction, attrition, and retention

Job satisfaction depends on overall motivation. Motivation and satisfaction levels vary within different regions in Ethiopia, with the highest in the Amhara region and the lowest in the Benishangul Gumuz region (69,70).

Different studies done in different parts of the country show that most rural HEWs are not satisfied with their job (29,60,70). The proportion of satisfied HEWs decreased with time because of additional assignments added to their list of responsibilities (29). Most HEWs feel that they are not appreciated and recognized by the management team and supervisors for the work and contribution they made to the community (29). The common motivating factor for HEWs is having the opportunity to improve community health (69).

In a study conducted in 2016 on HEP performance, the HEWs retention rate was 98% with low HEWs satisfaction (60). In another study, more than half (52%) of the HEWs have an intention to leave their job and this was related to high years of service, high education level, and being single (71).

Community Access

In a study in southern Ethiopia, the commonly known available maternal health service in the HPs was ANC follow-up, for 51.5% of the mothers (72). Women and husbands' awareness of the availability of other maternal health services, including institutional delivery at the HP level is low (2,72). The PWF and HDA community structures have increased communities' awareness of the necessity of using maternal health services, danger signs and symptoms, and service availability. However, most mothers are still unaware of services available in the HP and have low knowledge about pregnancy danger signs, and the benefit of using maternal health services (73).

The most commonly used maternal health service from HP is the ANC service. Even though ANC service use facilitates institutional delivery, in a study conducted in the south part of the country with high ANC coverage (86%), most mothers gave birth at home by TBAs (72). As the number of children increases the use of maternal health services decreases (74).

Concerning referral, HDAs and TBAs identify pregnant mothers in the community and refer them to HPs or notify the HEWs in the village. HEWs refer pregnant mothers for their first ANC and delivery service to health centres. During or before labour, HEWs call an ambulance and refer the labouring mother to the nearby health facility for delivery services or a term mother to MWH. Even though community acceptance of the referral is high in most of the country, most referral requests are made when the labouring mother experiences complications. Furthermore, few mothers do not accept the referral to avoid being sent to the MWH in a health centre before labour starts, because of the perception of service costs or actual transportation costs, lack of someone at home who looks after their children,

the experience of mistreatment, husbands' disagreement, and fear of lack of transport when returning (54,63,75). The relationship between the community and HEWs gets compromised when the referred mother and their family encounter a problem in the referral health facility as they blame the HEWs for the bad experiences they face (38).

Although government financing of the referral system is high, there is a shortage of ambulance services in various rural catchment areas. Due to various reasons, such as being occupied, in the garage, involved in an accident, or lack of petrol, ambulances may not come to the HP or the pregnant mother in time, which leads to home delivery or late arrival to the health facility with advanced complications, and even death (63,75).

Community centred care

All HEWs are female and the selection of females from the community for the program is considered as empowering women. The utilization of maternal health services is directly linked to women's status in the community and the HEP intends to empower women which will enable them to make healthy decisions for themselves and their families (25,76). The formation of the HDA helped to empower women in particular and the community in general as it is used as a forum for the community to exchange health problems, priorities, and decisions making which enabled community partnership in their health issues (25). Even though HDA training is a promising strategy for improving maternal health service utilization and awareness, only 14.9% of agrarian and 8% of pastoralist women are aware of the availability of the training (77,78).

Despite low utilization of maternal health services from HPs or limited provision of maternal health services in the community by HEWs, community satisfaction with HEWs' performance and the HEP, in general, is high (60). However, during referral, multiple studies revealed that mothers experience disrespectful care from unprofessional health workers (guards, ambulance drivers, or health care providers (54,62,63,79).

HEWs recruited from the community they serve have good relationships and are trusted by the community. However, when HEWs cannot provide delivery service because of a lack of skills, the community can lose trust in the HEWs and is prone to use TBAs (62). A study in Southern Ethiopia found that most HEWs did not provide delivery services which caused a community perception of TBAs being more capable than HEWs (61). In multiple studies, the HEWs' motivation decreased because of a lack of community trust and support, poor relationships with the community, and higher community expectations (29,61,69–71,80).

Community perception of quality of care is facilitated by factors such as culture-sensitive service provision, facility cleanliness, procedure explanation and taking consent/permission before performing a procedure, showing respect and dignity, emotional support, and equity of care (68,81,82). In 2018, an institution-linked community-based cross-sectional study was conducted in North-West Ethiopia to assess clients' perception of quality: only 13% of mothers who gave birth in a health facility within that year were satisfied (82).

Most rural communities have a positive attitude toward maternal health service utilization (79). However, HPs are considered unfit to provide maternal health services, especially delivery services, because of a lack of medical equipment and supplies (62,68).

Experience of intrapartum complications facilitates the use of institutional delivery as the mother fears the occurrence of the complications again (83). HEWs' use of stories about other mothers' experiences of obstetric complications facilitates the use of institutional delivery (63,75).

Health Systems Support

Selection and recruitment of HEWs

The core criteria for recruitment of HEWs are being female, above the age of 18, at least finished grade/class 10th, mentally and physically active, who can speak the local language, from communities of future assignment kebele, and chosen by the community (76). However, an assessment done on the trainees revealed that only age, education level, and ability to speak the local language are fully adhered criteria. Concerning age, it does not have an upper limit, and concerning education, except for grade level no limit was put on the school year they finished which led to selecting above the age of 30 participants with children and family responsibilities. In terms of selecting mentally and physically active participants, there was no medical check-up to follow this criterion which led to the selection of pregnant and handicapped trainees who got challenged to follow the training and implementation of the program as the program lacks a strategy to incorporate the disabled and disadvantaged community. The minimum grade point average (GPA) required was 1.2, this criterion limited the attraction of better students. These factors have impacted the training process of HEWs and also affected future working, living, and acquiring new skills processes (77). Even though participants of higher age had difficulty following the training, regarding maternal service provision they have more trust from the community than the young HEWs (29).

Living far from family after marriage because of the bureaucratic transfer process, having a new-born at home, and lack of transportation access in the rural community which causes a long tiring foot walk is among the main HEWs demotivating factors(80). Most married HEWs feel they do not have enough time for their family because of the high workload and time-consuming nature of the job (29).

Deployment, Preservice, and On-the-Job Training

The FMOH collaborated with the ministry of education on the training and production of human resources for the HEP. Among ten regions in the country, seven facilitated providing training facilities that were already existing technical and vocational education training (TVET) institutes. Forty TVET institutes were providing the training which then started to decrease upon achieving the maximum coverage of HEWs in 2010 (76,84). The FMOH deployment of HEWs reached all rural communities in 2009 with HEWs to people ratio of 1:2,437 from 1:23,775 in 2003 (76).

The FMOH and regional health bureau (RHB) are responsible for providing training of trainers for selected experts from TVETs to train HEW trainees and forming HEW recruiting teams at the district level. Following up on the quality of the training is also FMOH's and RHB's mandate, however, most trainers of HEWs flagged that the FMOH and RHB do not contact them to either check the quality of the training or invite them for updated/refresher training (25,61,84).

The TVET institutes lack demonstration rooms for the preservice training. Because of this, the one-year pre-service training focuses on a theory-based approach which limited the confidence, skills, and knowledge of HEWs in providing delivery services. Less emphasis was given to health education even though the program is designed to mainly focus on health promotion and preventive approaches. The lack of focus on health education limited HEWs ability to tackle cultural barriers, provide maternal health awareness, and also limited the development of their personal and social skills. (25,77,84). Providing maternal health services mainly requires demonstration-based training which made the FMOH provide on-the-job training. On-the-job training on basic emergency obstetric and new-born care (BEmONC) is occasionally given to HEWs. This training is an intensive one-month training that provides HEWs with the skills and knowledge on providing ANC, delivery, and PNC services. In a survey conducted in the North, more than 80% of HEWs had received on-the-job training to provide ANC, delivery, and PNC services (59).

The lack of appropriate training affects HEW performance in providing quality maternal health services (63,74,85). Preservice, and on-the-job training quality is the main determinant of HEWs skills and knowledge in providing maternal health services (59,74,85).

HEWs take competitive exams to be selected for academic-level advancement training. However, advancement of the education level will not bring career advancement and they will be expected to go to the same HP to provide the same services (29,86). Even though WHO recommends the provision of career opportunities to CHWs (80), the lack of career development or professional advancement after training is among the main reasons for HEW demotivation and intention of attrition (29,61,70). Selection of HEWs for training or promotion without clear parameters also causes demotivation and mistrust towards the management team (62).

In a national assessment conducted to assess health extension students' competency for their academic level, only 31% passed the test. English language understandings were the major factor that was significantly associated with the passing of the national competency assessment (87).

Provision of necessary resources and incentives

The FMOH developed a list of basic equipment and medical supplies depending on the HEP service packages and is responsible for providing and equipping HPs. For maternal service delivery a delivery couch, thermometer, fetoscope, weighing scales for new-borns and adults, examination bed, stethoscope, delivery kit, sphygmomanometer/BP apparatus, rapid test kits (for malaria), tetracycline eye ointment tubes, iron tablets, vaccines (TT, BcG), delivery care registration books, cold chain, refrigerator, HIV test kits, antibiotics, and contraception's are needed for providing ANC, delivery, and PNC (59,76). In various studies, on average above 80% of HPs have all basic medical equipment and supplies with the range of 65% in Gambela to 96% in Tigray (25,59,60,88). Even though the basic medical supplies and equipment are provided by the FMOH, the government budget to finance it is low (60) and it is donor-dependent which compromises its sustainability (64).

Various studies mention a lack of adequate basic medical equipment and supplies which are necessary for the provision of maternal health services as the main factor for HEWs not providing institutional delivery (74,85). The provision of adequate necessary equipment, medicines, and assistance of transportation by motor bicycle by the health centre and district health office (DHO) would enable HEWs to improve maternal health service delivery. This would also improve their motivation by sustaining the confidence the community has in them (80).

Regional and district health offices are responsible for the salary and incentives of HEWs (25). The salary of HEWs is the lowest compared to other health workers. Most HEWs consider their salary is not proportionate to the number of activities assigned to them and it does not cover monthly living expenses. Most HEWs supervisors agree that the salary is low, and it does not consider the difficult nature of their job (80). The salary budget is influenced by domestic resources for health expenditure and HEWs salary is funded by the government and Ethiopia's total health expenditure is low. Furthermore, even though the budget for the program is increasing in nominal terms the share of the HEP regarding the total expenditure of PHCU has been declining since 2010. The 25% share with 2.4 billion ETB (Ethiopian Birr) in the 2010/11 budget year declined to 22% with 5.1 billion ETB in the 2016/17 budget year (36).

The low salary of HEWs is causing demotivation and attrition. Even though the civil servant policy states any civil servant who worked more than 8 hrs per day gets extra incentives, HEWs are not getting paid for the overwork (29,80).

Supervision and data reporting and use

The DHO is responsible for technical support, supervision, and political leadership of the HEP. The DHO is staffed with supervisory health professionals and a management team. The supervisory

professionals are trained in the provision of supportive supervision and allocation of necessary resources to HPs (25). Health centres are logistic hubs and referral centres for the HPs under their catchment area and provide technical and professional support on a weekly basis (76). Even though the schedule for supervision from the DHO team and health centre professionals is in place, supervision is not given regularly (59). In 2019, only 20 % of HEWs received professional assistance with obstetric care from midwives (36). The frequency of supportive supervision and relationship with the supervisor is the main influencing factors of HEWs skills and knowledge (59).

Lack, shortage, or inappropriate supervision affects HEWs relationships with their supervisors and the community. The fault-finding nature of supervision and lack of feedback from the supervisor compromises the communication and trust between the HEW and supervisor (61), which leads to an absence of appreciation by the supervisor. Not being appreciated, supported, and acknowledged by the supervisor (and sometimes the community) are the main demotivating factors that lead HEWs to leave their job (29,80,89). HEWs who receive adequate quality supervision have a better competency in providing quality maternal health services (74,85) and this increases the community trust in HEWs (62).

Most high-performing district health offices use data for decision-making purposes (90). The FMOH has reformed the HMIS by establishing databases for all health system-level HMIS units. This will enable the production of quality timely data which helps in the planning, management, and decision-making process. However, the HMIS reform did not reach HPs as most HPs are in remote areas without access to electricity. The HEWs use paper for reporting and this is a challenge in acquiring timely quality data on maternal health service activities (25,90). This is constraining monitoring, response to changes, running a demand-driven resource provision, planning, and evaluation of HEWs performance in providing maternal health services (25).

Infrastructure

Above 90% of rural HPs do not have infrastructures such as electricity, water, and fixed telephone lines (25,59,60). Lack of infrastructures in HPs such as water, electricity, and roads affects HEWs motivation and performance (29,61,69–71,80). Community trust will be good when HPs are built well, needed medicines and equipment are available, and the facility is clean (80).

Distance/lack of roads affects HEWs performance in delivering quality maternal health services (63). In various studies conducted in different parts of the country, the common factor identified that influences maternal service use is long walking hours to the health facility because of lack of roads or transportation or costs (56,62,79,91–94). Inaccessible health facilities because of distance or lack of roads and payment for transportation are the main barriers to using institutional delivery services (91). Most rural pregnant mothers discontinue the ANC follow-up because traveling long distances to the health facility to utilize health services in their last trimester is challenging (83).

The expansion of network coverage is facilitating the communication between the HEWs and supervisors. Furthermore, it is contributing to the utilization of maternal health services. The HDAs notify HEWs about pregnant mothers in the community, and when the community members have the HEWs phone number notify HEWs about labouring mothers for her to facilitate ambulance service and notify about mothers who gave birth at home to use early PNC visits (95).

Community support

One of the principles of the HEP is active community engagement to ensure community empowerment and ownership of the program (25,96,97). The community participation initially focused on contributing to the infrastructure (HP building) and recruitment of HEWs (25,98). The community has participated in the building of HPs by providing construction materials and labour. In 2019, HP to community ratio was 1:3,967. However, only 37% of the HPs meet the standard requirements of the building (24,36). The engagement of the community in recruiting HEW trainee candidates was limited in most parts of

the country (25). When HEWs are not from the community they serve because of the lack of community engagement during the recruitment process, the HEWs will face difficulty to be accepted by the community because it affects the community's trust. Most rural mothers do not trust and are not open to discussing maternal issues with external people and this affects HEW performance and motivation (80).

HEWs are a crucial actor in between the health system and the community (61). HEWs use the assistance of voluntary community members for various HEP package implementations in the community. These voluntary community members are considered role models in the community in different aspects (in early adoption of HEP packages, development works, credibility by the community members, etc) and are selected from the community arrangements in the kebele. Even though kebele (where the HEP is being implemented) is the lowest administrative unit in the country, below it there are other community arrangements namely development group (comprised of 25-30 households) and one-to-five (composed of 6 households) (25,61). From this arrangement, model families are identified and women from that household are selected and receive 96hrs HEP packages training by HEWs over a three to four months period. These women are called the health/women development army (HDA) and assist HEWs in the implementation of the packages when they are selected from the one-to-five network by the members (24,25).

The HDA project is a women-centred program to improve maternal health outcomes which were launched in 2011/12 (61,99). The training includes encouragement, negotiation, persuasion, motivation, demonstration, basic health action, awareness of health services, and changing households into clean and safe home environments to maintain a healthy lifestyle. The HDA members are the leaders of the one-to-five community networks and by using the skills they acquired from the training they disseminate health messages to influence other households to develop a healthy lifestyle and improve their health-seeking behaviour (25). This design focuses on empowering women in particular and the family in general in health decision-making. The deployment of the initiative progressed rapidly and by 2016 approximately 3 million women were trained, who will in turn lead 3 million one-to-five networks which will cover 18 million households (99,100). The HEWs and HDAs have biweekly and monthly meetings by which they plan the implementation of program activities (100). Furthermore, they exchange feedback and reports which enable the HEWs to adjust their maternal health service provision to the needs of the community (61).

Concerning maternal health, HDAs identify, refer, and follow up pregnant mothers, encourage mothers to attend PWFs, and one-to-five network meetings, and disseminate maternal health information in the community such as danger signs and symptoms of pregnancy, benefits of ANC follow-up, institutional delivery, PNC, immunization, and family planning (61). A micro-level survey done in various parts of the country has revealed the increased maternal health service utilization following the HDA initiative launch (99,101–103). However, the challenges to the effective implementation of the initiative are the illiteracy of most HDAs which caused a lack of confidence and assertiveness. The quality of the training they receive depends on the strength of the HEW. Furthermore, they are not supported with enough practical resources such as leaflets, posters, stationery, reporting format, incentives, and adequate supervision. The HEW receives a verbal report from the HDA which makes the tracking down of the activities' results difficult (73). As almost all HDAs have families to look after they lack time to implement the required activities in the community (73,100,102).

Model families' participation in the HDA training is facilitated by factors such as a clear explanation of the purpose of the training, benefit of the participation, good HEWs reputation (community trust in HEW), peer pressure, witnessing the positive impact on other model families, and when the training is conducted close to their residency area (78). Lack of awareness of the importance of using maternal health services influenced by the low level of participation in one-to-five networks is a barrier identified in multiple studies (38,56,92). Lack of awareness is also attributed to mothers' and their spouse's literacy

levels (56). As illustrated in Table 3 community structures are beneficial in reducing MMR in the community by reducing delay and enhancing birth preparedness.

Table 2: Evidence summary of the effect of participation in the one-to-five network on reproductive age mothers' maternal health service utilization.

Target population	Study design	Outcome	Result
Mothers in the reproductive age group	Case-control	Maternal mortality	Mothers who are not members of HDA are twice more likely to die compared to those who are members (OR 2.07, 95%CI 1.04 to 4.11) (107)
Pregnant mothers	Cross-sectional	Birth and complication readiness	Preparation for birth and its complication is higher among those who are members and attendants of the one-to-five network (OR 2.52, 95%CI 1.17 to 5.39) (108)
Pregnant mothers	Qualitative	Delays in maternal health service use	"Initiatives to reduce delays can improve access to maternal health services, especially when HEWs are supported by HDAs" (81)

Distance of HDA, one-to-five, and PWF meeting areas from health facilities (as least as 2Km) significantly influences the ANC, delivery, and PNC service use as illustrated in table-2 (103). The HDA members who conduct their one-to-five or development group meetings within a 2Km radius of health facilities are 8 times more likely to use ANC services (104) and 6 times more likely to deliver in health facilities (101). This could be explained by the high probability of supervision and support of HEWs and health workers from the nearby health facility when the meeting is conducted within 2Kms to the health facility (103). According to 2016 EDHS, the national ANC service use was 62% with a 9.95Km average distance to a health facility. This average distance will vary in terms of regions and residency area, for instance, it increases when it comes to the rural population which in turn decreases the ANC used to 27%, within regions Somalia region have the lowest ANC use of 11.8% because of the highest average distance to the health facilities 26.43Km (11,56).

Table 3: Evidence summary of the effect of reproductive age mothers on the participation of HDA structure meetings (one-to-five network, PWF) and distance from health facility on maternal health service usage.

Target population	Study design	Outcome	Result
Reproductive-age women who gave birth in 1year preceding the study	Cross-sectional	Institutional delivery utilization	The distance to HDA structure meeting within a 2km radius from the nearest health facility was significantly associated with skilled delivery service use (AOR (95%CI) 6.03 (1.92, 18.93)) (101)
Reproductive-age women who gave birth in 1year preceding the study	Cross-sectional	ANC service Utilization	Distance to HDA structure meeting within a 2km radius from the nearest health facility was a significant predictor of skilled ANC service utilization (AOR=8.28; 95%CI 1.08 to 62.20) (105)

A well-functioning HDA program facilitates the relationship of the community with the HEWs and with the health system (103). A one-to-five network led by HDAs has positive effects on HEWs performance by referring pregnant mothers to health facilities, providing, and acquiring pregnant mothers' information in the community, and increasing the community's trust in HEWs and the health system (61,75,81,106). This in turn has resulted in an increased rate of institutional delivery in different parts of the country (75). However, the PWF is a more frequently conducted and attended get-together than

the one-to-five meeting as HDA leaders occasionally feel demotivated as they do not get any incentive (73). The HDA structures exist in more than 95% of the rural communities however only 26% of the kebeles have 30 HDAs for 1000 households (which is the indicator for functionality). This indicates the low functionality of the structure (36).

The kebele leaders are supposed to support HEWs in facilitating the invitation of the community to gatherings in the villages for PWF in the kebele compartment, where HDA leaders and HEWs give health education on maternal health services (ANC, institutional delivery, and PNC) benefits and pregnant mothers exchange information and support each other (61,73). Sometimes midwives of that catchment area attend the forum to assist the HEWs (73). However, support from the kebele leaders is poor in some parts because of poor communication and dialogue or expectation of per diem for the activities they carry out (61). Some kebele leaders and other political actors give HEWs other tasks than health responsibilities on top of the already existing high workload which demotivates HEWs (69,71,80).

Contextual factors

The traditional practice of pregnancy hiding in the community makes early identification of pregnant mothers and early initiation of ANC follow-up challenging (62). Late identification of pregnant mothers affects the initiation of the ANC in 1st trimester per recommendation (57). Most rural mothers had their first ANC in their second trimester (4-5 months) of pregnancy as shown in appendix 3.

Furthermore, delivery at home in Ethiopia, particularly in the rural community, is a deeply rooted culturally accepted norm that results in a home delivery attended by a traditional birth attendant (TBA) (61,91,92,106,109). Women are expected to follow their older generations (mother, mother-in-law, grandmother) culture and trend of not seeking health services concerning pregnancy. In some communities, women who give birth alone at home or somewhere else are considered brave (38,92). The other cultural factor is the different types of community cultural ceremony activities that are done during birthing. In various regions of the country placenta burial in the living home or the compound/yard (62) giving birth in a sitting position in the Afar region (92) and application of coal heat during labour in the Tigray region (30) are among the cultural reasons that the community deters from going to a health facility for delivery services (92,106). In Tigray region religious rituals such as using holy water and praying to St Mary using her picture are a trend, mothers and relatives prefer to give birth at home to do these practices. On top of this, the rural community in Tigray believes that a pregnant mother during labour will be targeted by the evil spirit if she gets out of the house which may cause complications and even maternal or child death (30).

Using female health providers facilitates women's maternal health service utilization as in the community it is culturally acceptable to discuss maternal health issues with women (25,76). Also, community members recognize the importance of HEWs being female as it enables them to discuss their maternal issues freely (61).

In a few parts of the country, studies revealed that the rural community perceives that all mothers who go to a health facility for delivery service get a cutting on the genitalia (Episiotomy) or undergo surgery (Caesarean section). This fear in turn prevents mothers from using institutional delivery when referred by HEWs (74,81).

The perceived absence of disease during pregnancy prevents the mother from using maternal health services and also husbands use this reason for not supporting their wives in using these services (92). In some parts of the country, rural communities perceive delivery as a natural phenomenon that can be assisted by TBAs or their relatives (30).

Discussion

The findings revealed that the HEP's limited contribution towards improving institutional delivery is influenced by a variety of interrelated factors that affect the performance of HEWs. The potential of the HEPs' contribution to the improvement of institutional delivery is negatively impacted by the limited quality of preservice and on-the-job training and poor supervision. This causes HEWs to have inadequate knowledge, skills, and confidence to provide delivery service. The majority of the HEPs are not built per the standard and lack water and electricity, which makes it difficult to provide quality delivery service. Inadequate incentives as compared to the workload negatively affect HEWs' overall motivation and satisfaction and lead to attrition. Although retention of HEWs is relatively high, their satisfaction on the job is low, which affects their motivation which in turn affects their performance in providing maternal health services. The satisfaction of HEWs is influenced by the provision of necessary resources for maternal health service delivery, incentives, their relationship with the community and supervisors, community trust in them, and acknowledgment or appreciation by the community and supervisors. Many of the factors concerning health system support also affect the community's perception of quality of care, and ultimately service utilization. At the same time, the availability of necessary medical equipment and supplies, provision of on-the-job training, and appropriate supervision and communication are among the main HEW performance-enhancing factors in maternal service provision from the health system perspective.

From the side of the community, maternal service use is influenced by contextual factors, mainly distance (lack of physical accessibility of the health facility), culture and beliefs, community perception of quality of care and their trust in HEWs, and previous experience of mistreatment. The HDA structure has significantly contributed to the increasing awareness of the benefit of maternal health services in the rural community. The magnitude of community and kebele leaders' assistance is found to be crucial in delivering maternal health services. As such, community support has improved the performance of the HEP, but there is still room for improvement.

The recruitment of HEWs criteria was not adhered to in recruiting HEW trainees. The adhered criteria have gaps, and this challenged the process of preservice training, which could also challenge HEWs working and acquiring new skills up on deployment. The limited engagement of the community in recruiting HEWs from their community could have compromised the trust of the community in HEWs. Because of the lack of age upper limit, married women with families were recruited, and these trainees were having challenges following the training session: - Married HEWs were more dissatisfied as most live far from their families, and most of them believe they do not have enough time for their family because of the high workload. Despite this, these married and older HEWs are more trusted in discussing and providing maternal health services. The gaps in the recruiting criteria could be due to new initiation with poor contextual pre-assessment of the program back then, therefore, revision of the criteria's and adhering to the proposed criteria's is essential to increase community trust.

The TVETs providing the preservice training do not have demonstration rooms. This explains the HEWs impression of a lack of adequate skills and knowledge in providing delivery services. The training focus on health education and promotion was low and this, in turn, prevented the HEWs from acquiring the necessary communication skills to persuade mothers, families, husbands, and communities to use maternal health services and in providing awareness of maternal health services in general and institutional delivery in particular. This explains the high provision of ANC and low provision of delivery services to some extent. The trainers did not receive any refresher training after the training of trainers, and the FMoH or RHB did not follow the quality of the training after the initiation. This could be because of a lack of monitoring and evaluation plans for the preservice training. Re-evaluating, following, and assisting TVET institutions is necessary to increase the capacity of the institutions to provide the necessary skills and knowledge to HEWs to provide quality maternal health services.

The deployment of HEWs and the building of HPs progressed rapidly and showed a significant change within six years (2003 – 2009). The assessments done at that time showed the accessibility of HPs to all communities was satisfactory which led to lowering the trainers and discontinuation of HP buildings. However, this review revealed that long walking distance is the commonest limiting factor to utilizing institutional delivery from the HPs and other health facilities. Home visits of HEWs increases the awareness of the benefits of utilizing maternal health services and birth preparedness. However, only half of all households in Ethiopia receive home visits which are less in the rural part because of distance and lack of roads in the villages, lack of time, and motivation. Therefore, the HEP shows limited coverage. More HPs and training of additional HEWs are needed.

Approximately 90% of HPs lack basic infrastructure (water, electricity, and telecommunication). This is a big challenge for HEWs to provide delivery services even if they have the skills as delivery services require hygienic practices for both the provider and client. Most labours occur at night and providing delivery services at night without light is difficult. On top of this HEWs are not paid extra money for the service they provide outside of working hours as the policy states so they may not be encouraged to deal with the challenge. More than 60% of the HPs are built without fulfilling the required criteria and need renovation and reconstruction per standard. Priority should be given to HPs during infrastructure development projects including roads, electricity, and water. The lack of telephones in HPs is a challenge to contact the health centre or DHO for consultation or to request an ambulance. However, the expansion of the network and usage of mobile phones have facilitated communication between HEWs and the community, the health centre, and DHO.

The skills and knowledge of HEWs in providing quality ANC are found to be low. The cultural practice of pregnancy hiding also affects the early initiation of ANC. The HEWs provide ANC follow-up for most rural mothers, though most ANC follow-ups are not provided per standard (>80%). Furthermore, those who came for ANC do not come back for delivery or seek delivery care from a higher facility. This could be because of the lack of focus on health education in the preservice training. Many HEWs have received on-the-job BEmONC training though the provision of delivery services in HPs is minimal. HEWs also believe that they have low skill levels to provide institutional delivery although it is not supported by a study. However, the low level of confidence is reflected in the fact that only 4% of all deliveries are conducted by HEWs. The lack of skills and knowledge also affects community trust, which in turn affects the HEW motivation and satisfaction. Even though the review revealed a low level of HEW satisfaction, the program has high retention rates. Assessment of HEWs skills and knowledge needs to be done to provide the necessary skills and knowledge based on the assessment.

The HEWs motivation is affected by the lack of opportunity for career development either through academic advancement after increasing their academic level through training or years of experience. To improve HEWs motivation and satisfaction and also to increase the human resource for health the FMoH in collaboration with the ministry of civil service and social affairs need to provide career opportunities for HEWs. The national dialogue on the introduction of the degree of the family health department for HEWs needs to be launched (80).

The HDA initiative has improved maternal health service delivery and utilization significantly by creating awareness and empowering women with a health-promoting role in the community and conducting various health education forums for women such as HDA meetings, one-to-five, and PWF. In the 2005 EDHS ANC coverage was 28% and institutional delivery was 5%, in 2011 the ANC coverage reached 34% and institutional delivery reached 10%, the improvements are because of the introduction of HEP and broader health system strengthening. After the introduction of the community HDA initiative in 2011/12, in the 2016 and 2019 EDHS, the ANC coverage doubled and reached 62% and 74%, and institutional delivery almost quadrupled and reached 26% and 48% respectively. Even though the initiative contributed to the improvement of maternal service utilization and delivery the functionality of the initiative has reduced over time because of a lack of support and the socio-economic problems of HDA members. In 2021, institutional delivery significantly decreased and reached 33% (a

15% reduction) (9). The reduction could be a result of the Covid 19 pandemic, internal conflict, political instability, or decreased functionality of HDA structures. The husband's decision is crucial in utilizing maternal health services through the involvement of males in the HDA structures is minimal or absent. Therefore, implementers should consider the involvement of males in future program development. Also, rebranding or redesigning, and relaunching the HDA initiative is required with a clear guideline about the responsibilities, incentives, and support.

Furthermore, women who are close to health facilities are more likely to use maternal health services than those far. The effect of HDA structures is mainly influenced by the location of the meeting: - meetings close to the health facility are often supported by HEWs or midwives from the health facility. Community participation in the meeting is also affected by the distance of the meeting area from them. The level of participation affects community awareness of the benefit of maternal health service utilization, birth preparedness, service availability, sign and symptoms of danger in pregnancy, and birth preparedness and complications. The involvement of HEWs and midwives must be facilitated by the health centre in the catchment area and also the meeting area should move from village to village rather than in one fixed place to increase community participation in the meeting.

The most used maternal health service from health post is ANC, this is due to the low level of community awareness on the availability of other maternal health services. The HDA structure has improved service use by increasing community awareness of danger signs of pregnancy, service availability, the benefit of birth preparedness, and institutional delivery. However, most rural mothers' awareness of the HDA training availability is found to be low. This could be due to decreased functionality of the structure because of a lack of appropriate support.

The review found that multipara mothers are less likely to use institutional delivery compared to a primipara (a mother who had her first child). The avoidance of institutional delivery for the subsequent pregnancy could be the prior experience of mistreatment, unexpected service or other costs, poor quality, lack of awareness of the benefit of institutional delivery, birth preparedness, and pregnancy-related complications. The review found that the magnitude of the experience of mistreatment is substantial. These mistreated or dissatisfied mothers may not only avoid the service for themselves, but they may also become a barrier by sharing their experience with other mothers and advising them not to use institutional delivery. To address this trained professional and responsive health care teams for mothers that offer compassionate, caring, respectful, and equitable care are a priority.

The community expectation of women to follow their older generation's footsteps in doing what their ancestors did, and the lack of cultural practices during giving birth in health facilities are found to be influencing the use of institutional delivery services. Therefore, enhancing HEWs awareness creation and health education skills, community engagement, and communication to understand the community's needs is critical to addressing their need and increasing demand.

The HP's provision of the first ANC service is contrary to the recommendation. However, the place of the first ANC visit lacks influence on the continuum of care. This needs more assessment because higher health facilities are supposed to be better in providing the ANC services and enhancing the mother's adherence to the continuum of care as they are more equipped and staffed than HPs.

The government expenditure on the HEP is declining and the supply of basic medical equipment and supplies to provide maternal health services is mostly donor based. This needs an assessment of the feasible and effective sources of alternative government financing to increase government expenditure on the programme and substitute donor-based support and ensure the sustainability of the supplies to the programme. This review found that the provision of necessary medical equipment and supplies and performance in providing maternal health services through the HEP varies across regions. This needs a systematic assessment to understand and address the cause of variability. For this, the DHO needs

capacitation to provide the necessary supplies, supervision, incentives, and training and facilitate the coordination between the health centre and HP to increase professional support equitably.

The community health worker performance measurement framework has enabled us to discuss most of the factors that influence HEW performance in contributing to promoting institutional delivery. Some contextual factors are not explicitly included in the framework, such as cultural practices, norms, and beliefs. This could be because the framework is developed for countries to see how they measure performance. As some of the contextual factors are very difficult to measure, they are not explicitly mentioned. To use this framework for specific interventions, it needs to be adapted to the country's context.

The limitations of this review are that some of the included studies are national level studies, multi-regional level, and some district level studies. Non-health factors such as governance and political issues were not covered in the literature we discussed. This could be because of a lack of studies on these topics or because the influence of these factors on HEP performance in maternal health was limited. The review was structured using a non-contextualized framework, which may have led to excluding other contextual factors that might influence the HEW performance in maternal health in Ethiopia.

Conclusion and Recommendations

Conclusion

The provision of on-the-job BEmONC training to HEWs and medical equipment and supplies necessary for maternal service delivery to HPs have been reasonable investments aiming to increase institutional delivery in Ethiopia. However, so far, it did not reach this aim. Most HEWs consider themselves incapable of providing the service. Even if they would, HP's lack of basic infrastructure necessary for delivery service, inadequately built HPs, and long walking distance inhibits HEWs from providing institutional delivery. Ethiopia is the only country where CHWs are tasked with institutional delivery. If the government wants to keep this strategy, it should increase the investment towards recurrent BEmONC training, improve HP's infrastructure, and renovate and build new HPs to improve the HEP coverage. In addition, supervision should be strengthened, incentives need to be re-assessed (e.g., higher salary, overtime compensation), and career development opportunities for HEWs should be seriously considered.

Community support has contributed significantly to the increased utilization of maternal health services. The HDA community structure was successful in increasing community awareness, ANC, and delivery utilization for eight years since its initiation, which then started to decline in its effect. Rebranding the initiative with appropriate evaluation and assessment and increased male involvement will help to enhance the effect of the HDA and enable the HEP to use community potential effectively.

Pregnant women in the rural community face various socio-economic and cultural challenges that hinder them to use maternal health services either from HPs or other health facilities. Even if they decide to use the service before complications arise, the long distance and lack of transportation are a challenge. Not all women agree to stay in a maternal waiting house in the health centre because they have other responsibilities at home. To address this, maternal awareness of the benefit of maternal health services, birth preparedness, and potential complications is critical. However, the HEWs' health education or persuasion skills seem low. Therefore, the HEWs need to be provided with appropriate communication skills to give health education and counselling to the community to provide awareness of the benefit of using maternal health services, birth preparedness, complications, and pregnancy-related danger signs and symptoms.

Many rural mothers report facing mistreatment during delivery services from higher health facilities, which prevents them and others from using institutional delivery (again). Maternal health care providers, especially delivery service providers (other than HEWS) must be compassionate and caring and should treat every mother equally and with dignity. These providers need to be trained in giving proper delivery service.

Recommendations

To - Agriculture and rural development office & FMOH

1. Prioritize rural HPs for infrastructure (roads, water, electricity) development opportunities.

To - Researchers

2. Conduct research on assessing HEWs skills and knowledge on giving safe and clean delivery services.

To - FMOH, Ministry of Education, Labour and Social Affairs

3. Increase the coverage of the HEP. To achieve this, the following actions need to be taken in sequence.
 - A. Technical and vocational education training (TVET) institutes need to be capacitated.
 - A.1. Every HEW training TVET institution needs to have a demonstration room.
 - A.2. The trainers must be provided with updated training of trainers with a following-up refresher training, supportive supervision, and encouragement.
 - A.3. The training process needs a plan of monitoring and evaluation followed by appropriate monitoring and evaluation according to the plan.

- B. Provide HEWs with appropriate training to fill their skill and knowledge gap, most importantly their confidence, health education, and communication skills.
- C. Recruit and train new candidates for HEWs following increasing the capacity of TVET institutes.
- D. Introduce a higher education level for HEWs which enables the health system to provide them with career advancement opportunities.

To – Maternal health care providers

- 4. Treat mothers coming from rural areas for delivery services cautiously as they pass various challenges to arrive at the health facilities. Be compassionate and caring towards them treat them with dignity and respect and provide comprehensive health education.

To – FMoH, Regional health bureau, District Health Office

- 5. Health posts must be renovated and maintained per the standard and new health posts must be built. For this, the government must increase resources from the yearly budget for health, donors, and the community. Community engagement in providing raw materials and labour is also essential.
- 6. Provide proportional incentives from available health care providers' financing options: depending on their outcome (contributions in increasing institutional delivery), pay for service, or consider paying for performance.
- 7. Strengthen HDA structures in the community by providing clear guidelines, about the responsibilities, time investment, incentives, and support. Avoid the expectation of financial incentives by the HDAs and provide the appropriate necessary support for the members such as stationaries, reporting formats, and recognition ceremonies. Rebrand and relaunch the HDA initiative based on the new guidelines.
- 8. Provide HEWs with health education and communication skills to address cultural and social barriers.

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Appendices

- Percent distribution of women age 15-49 who had a live birth in the 5 years preceding the survey by antenatal care (ANC) provider during the pregnancy for the most recent birth and percentage receiving antenatal care from a skilled provider for the most recent birth, according to background characteristics, Ethiopia MiniDHS 2019

Background characteristic	Antenatal care provider						No ANC	Total	Percentage receiving antenatal care from a skilled provider ¹	Number of women
	Doctor	Nurse/midwife	Health officer	Health extension worker	Traditional birth attendant	Other				
Age at birth										
<20	7.3	52.0	3.1	10.5	0.1	0.5	26.6	100.0	72.8	529
20-34	8.4	47.9	5.2	15.0	0.2	0.8	22.5	100.0	76.5	2,840
35-49	5.7	35.6	5.3	12.7	0.2	0.4	40.1	100.0	59.4	557
Birth order										
1	12.6	56.2	5.9	8.7	0.2	0.2	16.3	100.0	83.3	841
2-3	11.0	51.6	4.7	13.2	0.1	0.9	18.6	100.0	80.5	1,268
4-5	5.0	40.4	7.1	18.8	0.3	1.5	26.8	100.0	71.4	853
6+	2.2	37.5	2.5	15.6	0.3	0.1	41.7	100.0	57.8	965
Residence										
Urban	21.2	49.8	5.7	7.9	0.0	0.3	15.1	100.0	84.5	1,026
Rural	3.2	45.6	4.7	16.2	0.3	0.8	29.3	100.0	69.7	2,900
Region										
Tigray	22.0	52.3	10.7	9.0	0.4	0.2	5.3	100.0	94.0	287
Afar	10.3	44.3	5.3	2.7	0.3	0.0	37.1	100.0	62.7	51
Amhara	7.9	58.2	9.4	7.1	0.2	2.1	15.1	100.0	82.6	839
Oromia	5.0	40.7	3.1	22.0	0.0	0.0	29.2	100.0	70.8	1,519
Somali	5.1	21.7	2.2	1.2	0.0	0.2	69.6	100.0	30.2	218
Benishangul-Gumuz	9.5	46.5	2.4	24.8	0.0	0.0	16.7	100.0	83.3	47
SNNPR	3.1	49.6	2.3	14.5	0.6	1.0	29.0	100.0	69.4	787
Gambela	25.8	53.0	5.1	1.8	0.0	0.7	13.7	100.0	85.7	19
Harari	28.7	46.7	3.3	2.1	0.0	0.0	19.3	100.0	80.7	11
Addis Ababa	35.7	55.1	6.0	0.0	0.0	0.0	3.1	100.0	96.9	127
Dire Dawa	27.4	39.2	8.7	8.2	0.3	0.7	15.5	100.0	83.5	21
Education										
No education	2.5	39.3	5.1	15.2	0.4	1.3	36.3	100.0	62.0	2,014
Primary	8.1	54.6	4.6	14.2	0.0	0.1	18.5	100.0	81.4	1,415
Secondary	21.6	58.8	5.5	11.2	0.0	0.0	2.9	100.0	97.1	345
More than secondary	46.8	43.2	5.5	4.4	0.0	0.0	0.2	100.0	99.8	153
Wealth quintile										
Lowest	1.1	29.5	3.1	13.6	0.1	1.0	51.6	100.0	47.3	825
Second	2.1	43.9	5.2	19.8	0.2	0.3	28.6	100.0	71.0	822
Middle	2.9	50.8	5.7	16.2	0.4	1.3	22.7	100.0	75.6	761
Fourth	5.9	54.5	4.0	16.3	0.2	1.0	18.0	100.0	80.7	705
Highest	27.1	56.2	6.8	4.6	0.1	0.0	5.3	100.0	94.6	813
Total	7.9	46.7	5.0	14.0	0.2	0.7	25.6	100.0	73.6	3,927

Note: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation.

¹ Skilled provider includes doctor, nurse, midwife, health officer, and health extension worker.

2. Percentage of births assisted by Health extension workers in the 5 years preceding the Ethiopia Mini-DHS 2019, according to background characteristics.

Background characteristic	%
Mother's age at birth	
<20	3.7
20-34	3.7
35-49	5.4
Birth order	
1	3.1
2-3	3.1
4-5	4.9
6+	4.7
Antenatal care visits²	
None	1.6
1-3	5.6
4+	4.7
Don't know/missing	*
Place of delivery	
Health facility	5.9
Public facility	6.2
Private facility	0.0
NGO	0.0
Elsewhere	2.1
Residence	
Urban	1.2
Rural	4.8
Region	
Tigray	1.8
Afar	0.5
Amhara	2.8
Oromia	5.8
Somali	0.3
Benishangul-Gumuz	9.5
SNNPR	3.7
Gambela	2.4
Harari	0.6
Addis Ababa	0.0
Dire Dawa	2.0
Mother's education	
No education	4.2
Primary	3.9
Secondary	3.2
More than secondary	0.6
Wealth quintile	
Lowest	4.0
Second	4.0
Middle	6.7
Fourth	3.9
Highest	0.8

3. Percent distribution of women age 15-49 who had a live birth in the 5 years preceding the survey by number of antenatal care (ANC) visits for the most recent live birth and by the timing of the first visit, and among women with ANC, median months pregnant at first visit, according to residence, Ethiopia Mini-DHS 2019

Number of ANC visits and timing of first visit	Residence		Total
	Urban	Rural	
Number of ANC visits			
None	15.1	29.3	25.6
1	1.9	3.8	3.3
2-3	23.6	29.4	27.9
4+	58.7	37.4	43.0
Don't know/missing	0.6	0.1	0.3
Total	100.0	100.0	100.0
Number of months pregnant at time of first ANC visit			
No antenatal care	15.1	29.3	25.6
<4	43.4	22.3	27.8
4-5	32.3	32.2	32.2
6-7	6.4	13.5	11.6
8+	2.3	2.0	2.1
Don't know/missing	0.5	0.8	0.7
Total	100.0	100.0	100.0
Number of women	1,026	2,900	3,927
Median months pregnant at first visit (for those with ANC)	4.0	4.7	4.5
Number of women with ANC	871	2,052	2,923