



Understanding the Drivers of Reduction in Maternal and Neonatal Mortality in Ethiopia — An in-depth Case Study of the Global Health Exemplars

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Countdown to 2030
Women's, Children's & Adolescents' Health

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This report presents findings of the Ethiopia MNH Exemplar study which was implemented by the Ethiopian Public Health Institute in collaboration with the Ethiopian Ministry of Health and Countdown to 2030 for Reproductive, Maternal, Newborn, Child and Adolescent's Health. The study was funded by Countdown to 2030 through African Population Health and Research Center.

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LIST OF ABBREVIATIONS AND ACRONYMS

AARR	Average Annual Rate of Reduction
ANC	Antenatal Care
ASFR	Age-specific Fertility Rate
BEmONC	Basic Emergency Obstetric and Newborn Care
CBHI	Community-based Health Insurance
CBNC	Community-based Newborn Care
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CHE	Catastrophic Health Expenditure
CHEW	Community Health Extension Worker
CHW	Community Health Worker
CS	Caesarean Section
DHIS2	District Health Information Software 2
DHS	Demographic Health Survey
EDHS	Ethiopia Demographic Health Survey
EmONC	Emergency Obstetric and Newborn Care
ENMR	Early Neonatal Mortality Rate
ESPA	Ethiopia Service Provision Assessment
FMOH	Federal Ministry of Health
FP	Family Planning
GBD	Global Burden of Diseases
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
HDA	Health Development Army
HDI	Human Development Index
HDT	Health Development Team
HEP	Health Extension Program
HH	Household
HMIS	Health Management Information System
HSDP	Health Sector Development Program
HSEP	Health Services Extension Program
HSTP	Health Sector Transformation Program
ICCM	Integrated Community Case Management
IESO	Integrated Emergency Surgical Officers
IMNCI	Integrated Management of Neonatal and Childhood Illnesses
KMC	Kangaroo Mother Care
LBW	Low Birth Weight
LMIC	Low- and Middle-income Country
LNMR	Late Neonatal Mortality Rate
MaNHEP	Maternal and Newborn Health in Ethiopia Partnership

MCEE	Maternal and Child Epidemiology Estimation
MDG	Millennium Development Goal
MDSR	Maternal Death Surveillance and Response
MHH	Model Households
MMR	Maternal Mortality Rate
MNH	Maternal and Newborn Health
MWH	Maternity Waiting Home
NCD	Non-communicable Disease
NICU	Neonatal Intensive Care Unit
NMR	Neonatal Mortality Rate
OOP	Out-of-pocket
PDR	Perinatal Death Review
PHCU	Primary Healthcare Unit
PNC	Postnatal Care
PPP	Purchasing Power Parity
RH	Reproductive Health
RMNCH	Reproductive, Maternal, Newborn and Child Health
SARA	Service Availability and Readiness Assessment
SDG	Sustainable Development Goal
TFR	Total Fertility Rate
TT	Tetanus Toxoid
UHEP	Urban Health Extension Program
UN-IGME	United Nations-Inter-agency Group for Mortality Estimation
UN-MMEIG	United Nations-Maternal Mortality Estimation Inter-Agency Group
WASH	Water, Sanitation and Hygiene

EXECUTIVE SUMMARY

Ethiopia's success: What is already known

By 2000, Ethiopia's performance in health outcomes and literacy levels was among the lowest in the world and was poor even among the low-income group of countries. Several decades of war, famine and political instability had taken their toll. Ethiopia had some of the poorest health indicators in the world, including a rudimentary rural health infrastructure, poor health service coverage and some of the highest mortality rates globally.

From 2000, Ethiopia embarked on a massive effort to reach its citizens by expanding its health infrastructure and workforce into the rural areas where almost 80% of its current population of 115 million lives, according to UN estimates. Two decades later, Ethiopia had worked its way up the international rankings in numerous indicators. The gaps in terms of survival and other health indicators in comparison to other sub-Saharan African countries had reduced substantially by 2020.

Ethiopia's progress has not gone unnoticed. Many research studies have attempted to learn from Ethiopia's progress in the health sector. These include three Exemplars in Global Health studies focused on learning from Ethiopia's experiences (under-five mortality reduction, community health workers and stunting reduction), the Countdown to 2030 country case study on multisectoral interventions and under-five mortality as well as a multi-agency study led by Partnership for Maternal, Newborn and Child Health (PMNCH) on success factors for women's and children's health among many other studies.

There is broad agreement on a variety of factors that have contributed to Ethiopia's progress in health during the last two decades. Rapid domestic economic growth, albeit from a very low starting point, and the reduction of poverty, allowed for greater investments in the social sector and expansion of infrastructure. Government leadership in resource mapping and prioritization was strong, while global development partners were leveraged to support the One Plan, One Budget, One Report approach at all levels of the health system. A multisectoral approach was central to alleviating poverty and hunger as well as improving water and sanitation facilities.

A comprehensive health systems lens, rather than a collection of programs, was applied to the Health Extension Program which became the main vehicle for achieving universal coverage of primary healthcare, intended to reduce all the principal dimensions of health inequalities. Decision-making was driven by evidence, data were used for adaptation and prioritization, and monitoring at the local and national levels guided programming cycles. Multiple strategic innovations helped overcome bottlenecks to reach the vast underserved rural population. These included community mobilization and community-based service delivery, task shifting, creation of new cadres of health workers, decentralization of management and healthcare financing strategies, effective use of international partnerships, and other community engagement platforms such as the Women's Development Army, as well as the initiation and expansion of Community-based Health Insurance (CBHI).

Taking it further: The maternal and newborn health exemplar

This study of the drivers of the decline in maternal and newborn deaths in Ethiopia builds on the lessons learned from this array of evaluative studies. In part, we cannot avoid repeating some support of the general knowledge of the drivers of success in Ethiopia, as much of the evidence we generated for maternal and newborn health is in line with previous studies of maternal and child health, nutrition and primary healthcare. In other areas, however, the explicit focus on maternal and newborn health allowed us to develop a deeper understanding about the drivers of progress and to also identify some areas where much more progress can be made to reduce maternal and neonatal mortality.

We used a common conceptual framework to systematically investigate interrelated factors driving the changes. This considers a set of policy and system levers (distal drivers) that governments can use to modify programs and service levers such as access to and quality of care (intermediate drivers) that affect coverage and equity and ultimately impact the survival and wellbeing of women and children. The framework takes into account context variables at various scales - macro, community, household and individual - in all its levels.

The main data sources were the five demographic and health surveys conducted between 2000 and 2019; five health facility assessments including 2008 - 2018 emergency obstetric and newborn care assessments (EmONC), Service availability and readiness assessment (SARA), Service Provision Assessment (SPA Plus), routine health management information system (HMIS) data, and global estimates. A review of a wide range of documents on policies, plans and programs was conducted. This review also included the rich variety of published and grey literature on maternal and newborn health in Ethiopia.

Why Ethiopia is an exemplar

In 2000, Ethiopia's mortality rates were high compared to the sub-Saharan Africa average. Since then, its reductions in maternal mortality and, to a lesser extent neonatal mortality, outpaced progress in many other countries in sub-Saharan Africa, reducing the country's gaps with the regional averages (Figure 0-1). Furthermore, Ethiopia was selected as exemplar because of its performance in the health sector and net economic growth.

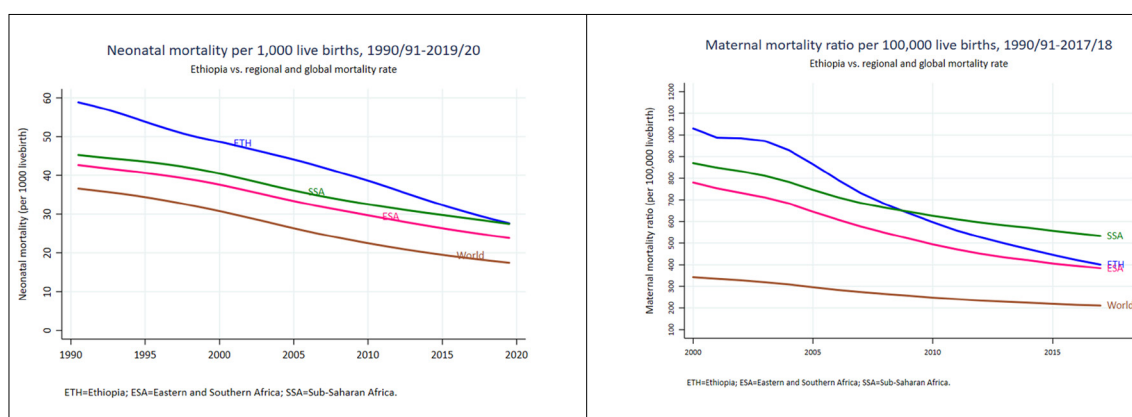


Figure 0-1: Maternal mortality ratio and neonatal mortality rate in Ethiopia, compared to sub-Saharan Africa, Eastern and Southern Africa (ESA) and the world, 1990-2020 (UN estimates)

Positioning Ethiopia in a mortality transition framework

To assess Ethiopia's progress as part of mortality patterns worldwide we developed a five-stage transition model for maternal and peri-neonatal (stillbirth and neonatal) mortality. Figure 0-2 shows mortality estimates from 149 countries with their location in the mortality transition in 2017. Stage I are countries with the highest levels of maternal and peri-neonatal mortality, where access to services is a major challenge. Stage II represents major improvements in access leading to reductions in mortality, which continues in Stage III. As countries progress, quality of care and comprehensive access to emergency obstetric and neonatal care becomes increasingly critical to drive down mortality into the subsequent stages. Ethiopia's experience describes how a country moved from Stage I to late Stage II, almost reaching Stage III which is attained once maternal mortality is below 300.

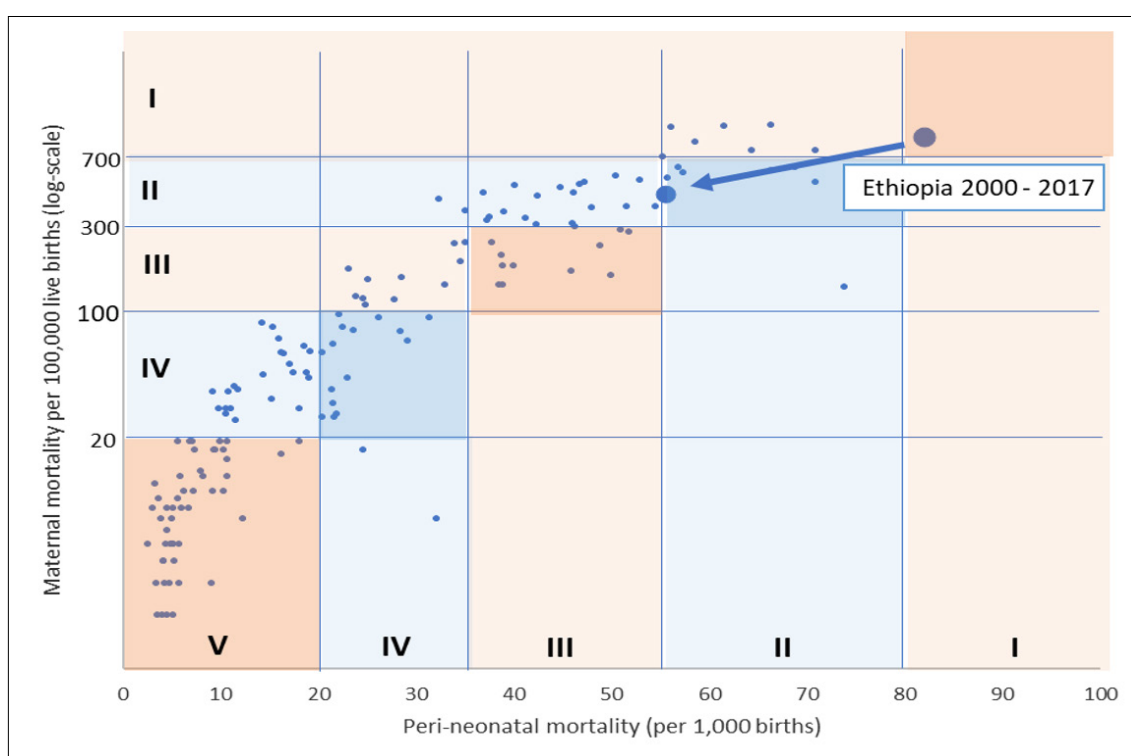


Figure 0-2: Maternal and peri-neonatal mortality situation in 2017 (UN estimates) in all countries with trend 2000-2017 in Ethiopia.

Strong declines in maternal and neonatal mortality

Since 2000, maternal mortality has declined by 61% to about 401 deaths per 100,000 live births, while neonatal mortality has almost halved from about 60 to 33 deaths per 1,000 live births during the three decades since 1990, with the fastest decline occurring post-2010. Stillbirth rates also declined by about one-third since 2000.

Evidence of reducing inequalities for neonatal mortality was mixed. Rural-urban differences reduced over time, but wealth-related disparities remained large. Further, large inequalities in neonatal mortality by region persisted, especially in the mini-Ethiopia Demographic and Health Survey (EDHS) of 2019. All regions experienced neonatal mortality rate (NMR) declines over the past several decades, with average annual rates of reduction ranging between 1.7% and 2.2%. The two outliers were Tigray with the fastest rate of decline and Somali with the slowest rate of decline, indicating the progress made in reducing NMR within the Tigray region was about six times faster than in the Somali region. The most recent surveys also show a possible stagnation of the neonatal mortality decline at around 33 deaths per 1,000 live births, while NMR in more than 80% of the regions likely falls in the range between 20 and 40 deaths per 1,000 live births.

Reductions in infectious disease mortality including sepsis, with abortion-related deaths, made the greatest contribution to the maternal mortality decline. Reductions in maternal-fetal transmissions contributed to the decline in stillbirths. Infectious diseases such as neonatal sepsis, pneumonia, diarrhea and tetanus contributed to 45% of the neonatal mortality decline. This was also confirmed by major reductions in neonatal deaths after the first week when infections predominate 53% of total neonatal mortality decline.

Impressive increases in all service coverage indicators

The increases in coverage of key interventions have been impressive between EDHS 2005 and EDHS 2019, with the largest improvement occurring in the 2009-2014 period (i.e., years representing period preceding DHS 2011 and DHS 2016). Figure 0-3 presents the changes in service coverage of key interventions, including first antenatal care visit (from 27% to 74%), four or more antenatal care visits (from 12% to 43%), institutional births (from 5% to 48%), and caesarean section (CS) rates (from 1% to 5%). Other notable changes include demand for family planning satisfied with modern methods (from 14% to 61%), initiation of breastfeeding within one hour after birth (from 47% to 72%), and postnatal checkups for mothers (from 7% to 34%) and newborns (from 0% to 35%) in the first two days after birth.

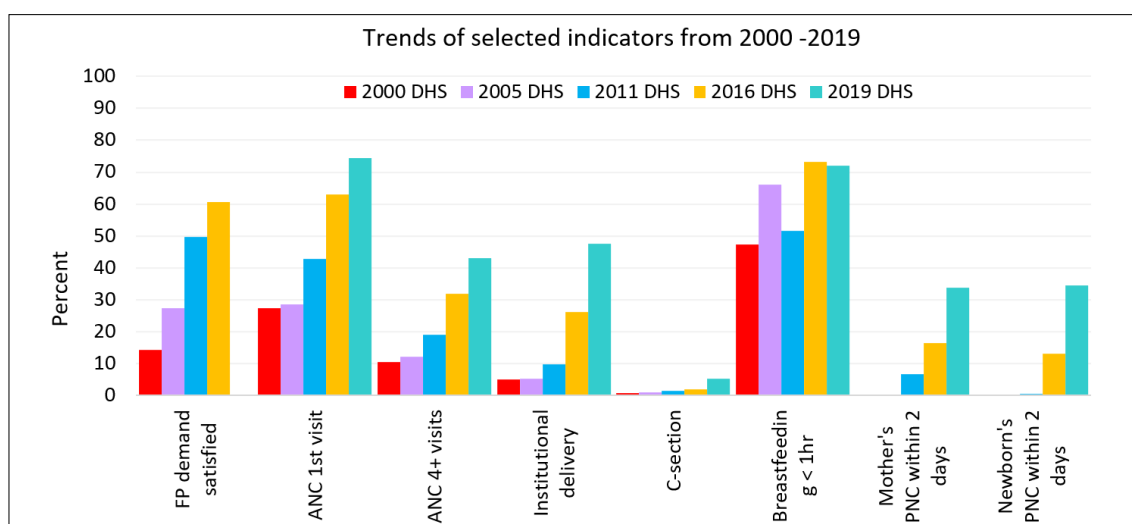


Figure 0-3: Trends in key indicators of antenatal and delivery care, family planning and early initiation of breastfeeding in Ethiopia, EDHS 2000-2019.

Given the concentration of maternal, late fetal and neonatal deaths around the time of delivery, the increase in institutional deliveries is most significant. The increase was primarily due to more care provided by nurses and midwives rather than physicians, as well as having deliveries in health centers (77% of the total increase in delivery coverage) rather than in hospitals.

The greatest progress in coverage for most maternal and newborn health (MNH) indicators was made in rural areas, reducing the rural-urban gap, and, to a lesser extent the disparity between the lowest and highest wealth quintiles. Large regional inequalities continued to persist but Amhara, Tigray and the Southern Nations, Nationalities, and Peoples' Region (SNNPR) made greater progress than average in bridging some of the gaps between themselves and the city regions of Addis Ababa, Harari and Dire Dawa.

Little comparable data on quality of care is available. The coverage of antenatal care with a quality component - a content-qualified ANC composite indicator including timing, frequency and contents of visits - increased from 16% to 42%, parallel to increased attendance for first ANC visits. Neonatal mortality among health facility births declined from 46 to 35 deaths per 1,000 live births but the rate remained higher than that for home births which declined from 38 to 30 deaths per 1,000 live births. This may be related to the reality that most deliveries at facilities are referrals and high-risk, and could be compounded by limited-service availability and readiness to provide basic essential newborn care services. All this suggests that facility readiness has to improve in concert with increased facility births of high-risk newborns to attain maximum impacts in terms of newborn survival.

How the health system was transformed

The Health Extension Program (HEP), initiated in 2003, led to major increases in demand for and access to health services, especially in rural Ethiopia, particularly from 2008 to 2010 (Figure 0-4). Health infrastructure was expanded dramatically, first for health posts (during 2003-2011), then health centers (during 2008-2014) and finally hospitals (from 2014). This was accompanied with improved availability of ambulances for emergency transport to hospitals and health centers, as well as the gradual increase of maternity waiting homes, reinvigorated by policy guidance in 2015. However, the misuse of ambulances and high fuel costs posed challenges in some circumstances.

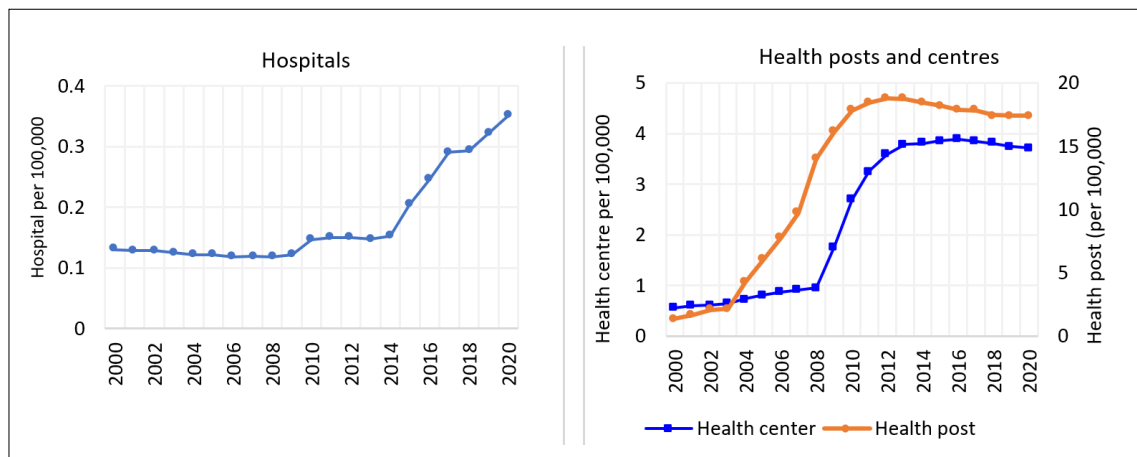


Figure 0-4: Trends in density of health facilities in Ethiopia, 2000-2020

The health workforce expanded in multiple directions. Training and deployment of health professionals was stepped up from 2003 which led to major increases in the number and density of nurses and midwives from 2008-2010, followed by physicians from 2014. Task shifting to address the shortage of surgical workforce, resulted from Integrated Emergency Surgical Officers (IESO) initiative from 2012 (Figure 0-5), and accelerated training programs in some disciplines such as the ‘accelerated health officers training program’ resulted in the increased availability of these cadres within a short time. The density of core health professionals (physicians, nurses, midwives and health officers) increased from 1.6 per 10,000 people in 2000, to 4.6 in 2010 and 11.6 in 2020, representing a seven-fold increase in density within two decades even as the population was growing rapidly. Despite these gains, the density is still well below the World Health Organization’s (WHO) 2016 indicative threshold density of 44.45 health workers per 10,000 people.

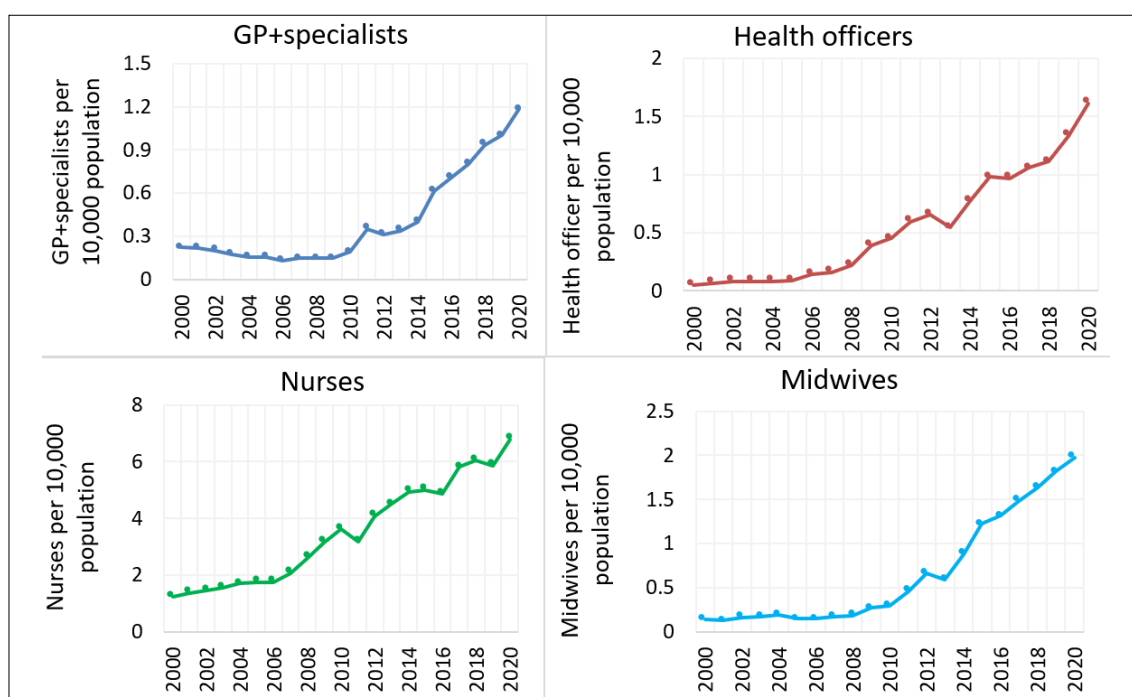


Figure 0-5: Trends in health workforce density in Ethiopia, 2000-2020.

The rapid scale-up of a new cadre of Health Extension Workers (HEWs) from 2005 to 2009, rising to almost one worker per 2,300 people was a successful strategy for staffing health posts and providing community-based services. In 2011, when service coverage was still below target, further efforts were made to create demand through volunteers in the Health Development Army to address the demand side. Several studies have concluded that the millions of volunteers contributed significantly to the increased demand and uptake of services.

Regional differences in health worker densities are large (Figure 0-6). The highest absolute increases in density of core health professionals (physicians, nurses, midwives and health officers) were recorded in the Tigray, Gambela and Benishangul-Gumuz regions during the two decades. The national rate of increase was closer to the more modest increases observed in the two large population regions of Amhara and Oromia.

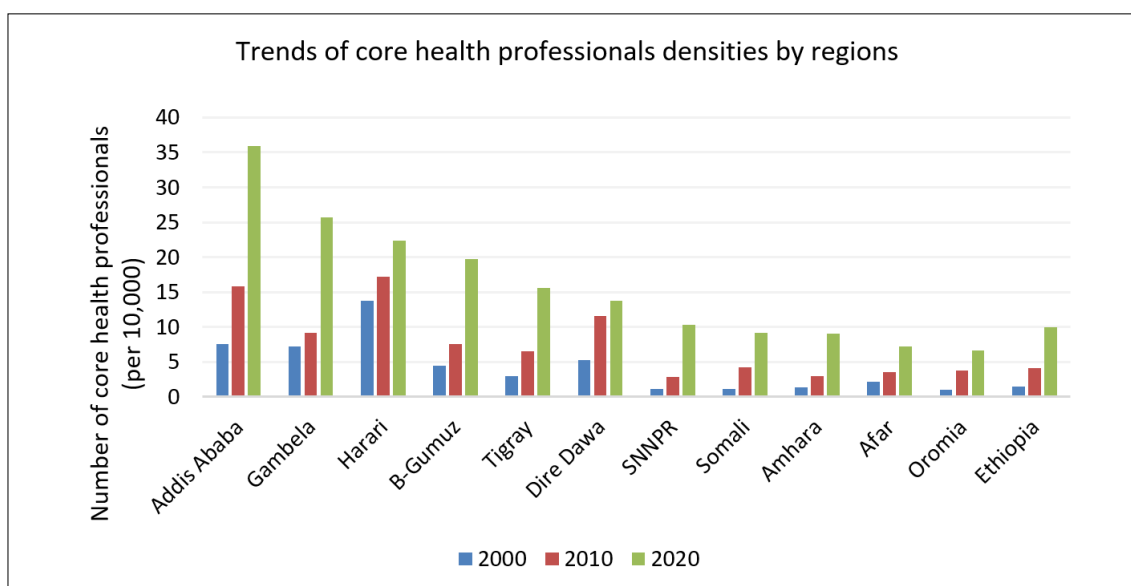


Figure 0-6: Number of core health professionals (physicians, nurses, midwives) per 10,000 people, at a national level and by region, 2000, 2010 and 2020

During the 2008-2016 period, the proportion of hospitals (comprehensive) and health centers (basic) with emergency obstetric and newborn care (EmONC) services increased from 11% to 40%, while 42% of hospitals offered abortion services (up from 36%). Service readiness also improved for tracer items such as magnesium sulphate, oxytocin, bags and masks for neonatal resuscitation, and hospital capacity for CS and blood transfusion. Major gaps remain especially for neonatal care of small and sick newborns. The proportion of deliveries occurring in EmONC centers was still small by 2016 (one in eight births).

Other programs such as the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) and community management of childhood illnesses have contributed to the reduction of post-neonatal and child mortality. However, they are less likely to have had a major impact on neonatal mortality, partly because neonatal interventions were prioritized later according to health facility assessments from 2014.

The contextual changes: Linking economic and social progress to fertility trends

The reductions in maternal and newborn mortality rates occurred during two decades of strong economic growth which led to reductions in the share of people living below the poverty line from 44% in 2000, to 30% in 2011 and 24% in 2016.

Women's literacy is a major factor in maternal and neonatal mortality transitions. Female literacy doubled (from 24% to 48% during 2000-2019) and there were major increases in primary school enrolment (from 24% in 2000 to 74% for girls in 2016). However limited progress was made in secondary school enrolment which stalled at 20% by 2019 for both boys and girls. There were some improvements in female empowerment, according to international indices and survey data, but overall Ethiopia's gender inequality remained high, according to general measures such as the Gender Inequality Index.

Total fertility declined from 6 to 4.1 children per woman during 2000-2019 which was a major contributor to the progress in survival: 26% of maternal mortality and 29% of neonatal mortality declines can be attributed to the fertility decline. The median age at first marriage increased from 18.1 to 19 years.

Living conditions improved including an increase in basic access to water from 19% to 41% but access to basic sanitation remained at a low 7%. Nutritional status improved from 2000 to 2016, shown for instance by a major reduction in women classified as thin (from 30% to 22%) and a decline in the proportion of women with short stature (from 3.6% to 2.4%). Households with electricity increased from 13% in 2000 to 23% in 2011 and 35% in 2019, implying that much of the mortality reduction was achieved without electricity access in rural households.

Policy and financing levers driving change

Most of the findings from the policy timeline analysis and review of health financing confirmed what other assessments of health progress have concluded. Political commitment combined with strong national leadership by the Ministry of Health, played a critical role in driving change to meet the situational needs. The development and implementation of a well-organized system of health strategies, policies and plans, with quality and equity health plans, reviews of progress, financing reforms, and accountability, has been in place since the late-1990s. This includes initiation and expansion of CBHI, implementation of innovative healthcare financing strategies and district- (or woreda-) based planning and monitoring practices. The alignment of development partners' plans with the national framework has been a central element, and much better than in many other countries that rely on external funding for large parts of their budgets.

From the start, maternal and child health was at the center of the transformation of the Ethiopian health system. Maternal health policies were prominent in line with the Millennium Development Goals (MDGs). Aspects of newborn health were explicit in plans from 2005 but were only prioritized from 2010 and further expanded in subsequent years.

Total health expenditure per capita increased fourteen-fold during the 1995/96 to 2019/2020 period (the increase would be more than six-fold if using purchasing power parity (PPP) adjusted US\$). The increase was predominantly driven by government resources and out-of-pocket spending in the initial years (Figure 0-7). Total health expenditure as a percentage of Gross Domestic Product (GDP) increased from 3.8% in 1995 to 6.3% in 2020. External resources were large throughout the scale-up, ranging from 9-50% of total health expenditure, reaching their highest levels from 2004 onwards. Maternal and newborn health received the highest levels of external funding from 2012 onwards.

Out-of-pocket health spending was high from 1995 and declined progressively from then. It still constituted a high 31% of total health expenditure by 2020, putting many households at risk of catastrophic health expenses. Even though most maternal and newborn services were free of charge according to policies, some studies showed that many women still paid for supplies and other costs related to normal deliveries in 2008 and CS operations were not available for free. Subsequent efforts addressed these obstacles.

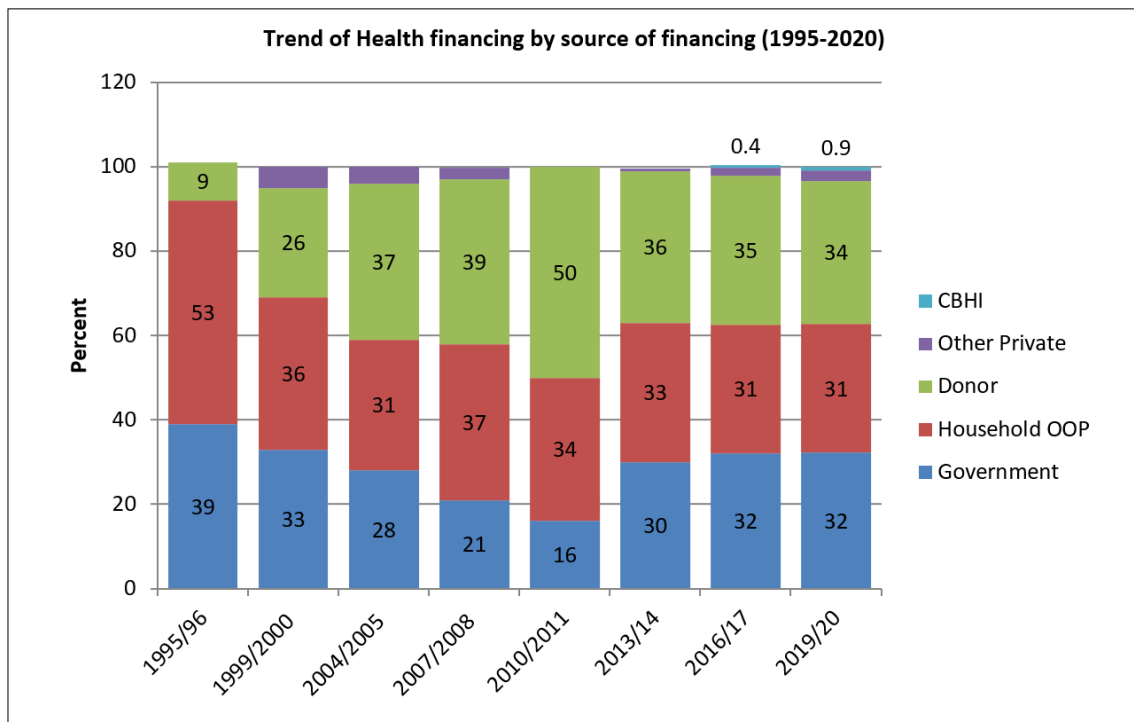


Figure 0-7: Health expenditure trends in Ethiopian Health care system by sources, 1995-2020.

Conclusion

The MNH Exemplars Study drew on an interdisciplinary framework to assess trends in mortality, improvements in intervention coverage, health system changes, policy developments and relevant contextual factors in Ethiopia over the last two decades. The overall aim was to explain Ethiopia’s significant progress in reducing maternal and neonatal mortality.

There is strong evidence that exemplary progress was made in improving maternal and newborn health. Reducing maternal and newborn mortality was prioritized in policy and technical approaches. Some interventions (such as community health extension worker programs and Community-based Health Insurance) were adapted and operationalized based on evidence from pilot testing and rigorous evaluation. These efforts were complemented with the allocation of adequate financial and human resources, as well as mechanisms for monitoring and accountability. Through triangulation of the assembled data, we can conclude that five main factors explain Ethiopia’s successes:

First, economic development resulted in more households coming out of poverty, improvements in water and sanitary facilities as well as transport and communication modes. This contributed to major progress in rural areas, even though many economic indicators were still at a low level among rural households by 2020.

Second, women are attaining higher levels of literacy and education, are gradually getting married later and having fewer children. All of these factors point towards some increases in female empowerment, even though the evidence for this is not strong.

Third, access to and utilization of basic delivery services rose by increasing the number of health posts and health centers. This was accompanied by a rise in access to basic and comprehensive maternal and newborn health services through increasing the number and distribution of facilities, as well as by reducing financial barriers through abolition of user fees for normal delivery care.

Demand for services benefitted greatly from a well-planned nation-wide effort to increase community engagement through the Women's Development Army, while measures to bridge the gaps between healthcare demand and access such as provision of maternity homes and ambulances further promoted service coverage.

Fourth, multiple developments to strengthen the health workforce were key to improvements in maternal and newborn health. These included increasing the number of nurses, midwives and health extension workers as well as volunteers in the Health Development Army and new cadres of surgical officers.

Fifth, equity was central in all policy making and implementation, initially focusing on rural populations and later on nomadic and urban populations. There is some evidence of greater equity between urban and rural populations, but less so between the highest and lowest wealth quintiles. Regional differences appeared to have reduced by 2016 but the 2019 survey did not confirm this trend. The pastoralist regions of Somali and Afar are lagging, and the regions with large populations - Amhara and Oromia - are still behind the national average on neonatal mortality.

Despite the significant progress made over several decades, Ethiopia still has a long way to go in terms of the maternal and (peri)neonatal mortality transition to attain the targets set in the Sustainable Development Goals (SDGs). While the primary purpose of the MNH Exemplars Study was to better understand positive changes in maternal and neonatal mortality and health during the past three decades, it is possible to identify the following general policy implications.

Policy Implications

Access to reproductive, maternal and newborn health services for all: There is still a major proportion of pregnant women and newborn babies who do not use health services. Existing strategies in the health extension program, including demand creation in the community and increasing access through health posts and health centers, as well as maternity waiting homes and transport facilities need to be scaled up further to reach all.

Reduce inequalities: Universal coverage of maternal and newborn healthcare can only be achieved by reaching all women and newborns in all regions and by ensuring the poorest have access to the services and actually use them. Further expansions of health infrastructure and the health workforce, combined with innovative approaches, especially in the pastoralist regions, are necessary. In addition, the relatively low coverage in maternal and emergency obstetric and newborn care in Ethiopia's most populous regions - Amhara and Oromia - need special attention.

Quality of care: At the same time, increasing the quality of antenatal, delivery and postnatal care and ensuring universal access to EmONC will increasingly require greater investments in hospitals, midwives, physicians, referral networks, maternity waiting homes and other identified priorities to ensure that every woman and baby has access to life-saving interventions. Hospitals will increasingly play an important role in the mortality transition, for instance, as a way to enhance survival of small and sick newborns as well as deal with maternal emergencies and further reduce mortality.

Fertility decline: A continued strong family planning program to reduce unmet need is likely to result in further fertility declines which are a major contributor to maternal and neonatal mortality reductions.

Health system strengthening: Ethiopia needs to maintain momentum with the tremendous progress made over the past two decades, as many system indicators, such as health facility and health workforce density, are still low by international standards. This will need to be supported by continuing increases in domestic funding for health, especially maternal and newborn health, supported by well aligned external support in line with the five-year Health System Transformation Plan.

Furthermore, priority should be given to strengthening health system resilience to meet the challenges that lie ahead (such as preventing shocks to the health system during emergency situations).

Improved quality and use of health systems data for decision making: Quality health information data that is largely generated by routine health facility reporting systems, triangulated with data from periodic surveillance and survey programs allow governments to develop a more responsive and resilient health system. Quality health systems data are key to establishing effective and continuous inequality monitoring systems for tracking performance towards national and international targets, and attainment of equity at all levels of the health system. This is particularly important to systematically identify where inequalities exist and the design and implementation of equity-oriented interventions to ensure that no one is left behind. Given Ethiopia's priority for action-oriented performance monitoring at local levels, continued concerted efforts are needed to improve access to and quality of health systems data. This should be accompanied by strengthening of analytical skills, to further enhance evidence-informed, decision-making processes at all levels of the health system.

Data use for scaling up interventions: Ethiopia has commendable experience in using data for adaptation and prioritization, to monitor program implementations. Such practices and strategic approaches are known to have positive impacts on improving MNH outcomes, suggesting that the use of evidence for adaptation, prioritization and scaling up of MNH programs needs to be appreciated and strengthened further.

Women's education and empowerment: Similar to the health sector, major advances in the education sector particularly in terms of female enrolment and retention need to continue and reach universal levels at secondary school level. Higher levels of education, combined with stronger decision-making power on the use of key reproductive and maternal health services, will contribute to further declines in maternal and newborn mortality.



INTRODUCTION

The world has made substantial progress in maternal and child survival over the past several decades. The number of maternal deaths reduced by nearly 38% (from 451,000 in 2000 to 295,000 deaths in 2017), while neonatal deaths reduced by nearly 41% (from a little over 4.1 million in 2000 to 2.44 million in 2019) (1). It is important to note that most maternal deaths, stillbirths and neonatal deaths are preventable with quality healthcare during pregnancy and childbirth (2).

While the overall reduction was laudable, progress has been uneven and many countries are unlikely to reach the target outlined by Sustainable Development Goal (SDG) Three if progress continues at the same rate, particularly in sub-Saharan Africa (3,4). The Exemplars in Maternal and Newborn Health Study (MNH Exemplars Study hereafter) aims to research and document the drivers of success in the exemplar countries to provide evidence and lessons for other countries on their path to 2030. The study's specific objectives are to:

- Increase in-depth understanding of pathways and success factors for the rapid reduction in maternal and neonatal mortality since 1990.
- Increase understanding of counteracting factors and implementation challenges that explain the variable effects of these success factors in sub-national areas within Ethiopia.
- Create cross-country synthesis of success factors and causes of slow progress or lack of progress.

The MNH Exemplars Study involved seven countries including Bangladesh, India and Nepal in South Asia, Morocco in North Africa and Ethiopia, Niger and Senegal in sub-Saharan Africa. The Ethiopia Exemplar Study was conducted as the Gates Ventures Exemplars in Global Health initiative which covers a range of health-related topics.

1.1 Why is Ethiopia an exemplar?

Ethiopia, the second most populous country in Africa, is home to over 115 million people (5), and is classified as a low-income country (5). Remarkable improvements in health and development have been observed in Ethiopia during the past three decades. These include significant improvements in maternal and neonatal health. In 2000, Ethiopia accounted for 7% of all maternal deaths globally but by 2018, this had been reduced to 5%.

In 2000, Ethiopia's mortality rates were high compared to the average rates in sub-Saharan Africa. Seventeen years later, the gaps had reduced tremendously. The average annual rates of reduction (AARR) in maternal and newborn mortality in Ethiopia between 2000 and 2017 were approximately 5.5% and 3% respectively. This was well above the 2000-2017 global average annual rates of reduction in maternal mortality (3.3%) and very close to that for neonatal mortality rate (3.1%). These reductions in Ethiopia exceeded the mean AARR for sub-Saharan Africa as well, which was an estimated 3.1% for maternal mortality ratio (MMR) and 2.2% for neonatal mortality rates (NMR) from 2000 to 2017 (Figure 1-1). Furthermore, Ethiopia was selected as an exemplar because of its net economic growth performance.

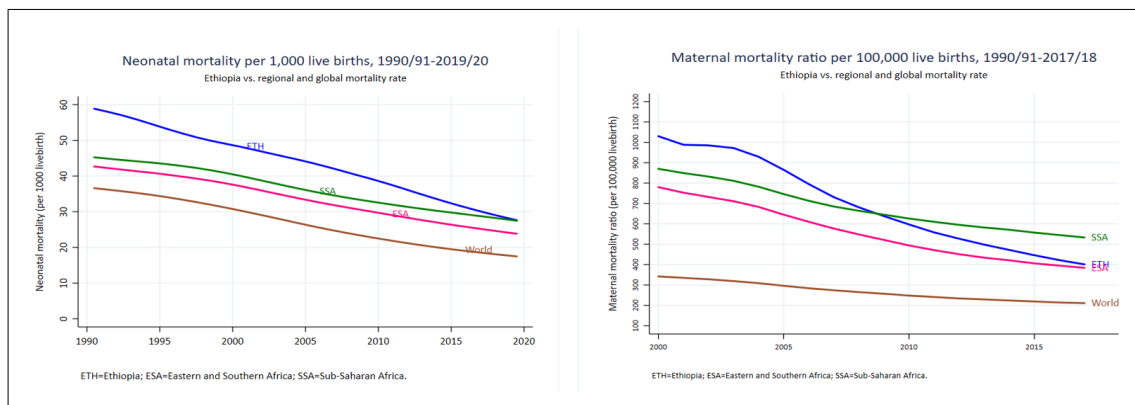


Figure 1-1: Levels and trends in Ethiopia's neonatal mortality rate and maternal mortality ratios compared to regional and global average trends compared to regional and global average

These improvements in maternal and newborn outcomes occurred alongside broader socio-economic changes and major investments in health and infrastructure. These include Ethiopia's introduction, and subsequent expansion of a community-based health extension program, which contributed significantly to improvements in a wide range of health indicators such as utilization of maternal health services (such as family planning and antenatal care), and immunization and child survival in rural Ethiopia (6,7). This study aims to gain further insights on the importance of specific investments, policies and strategies in reducing maternal and newborn mortality as well as health outcome inequalities within Ethiopia. This is possible because Ethiopia has conducted multiple national surveys since 2000, and there is a wealth of existing research on factors driving health progress, including an Exemplar study on under-five mortality (8).

The size and diversity of Ethiopia also enabled analyses of data at sub-national level, as needed, to gain further insights into geographical disparities in the country's success in bringing down maternal and newborn mortality rates in recent decades. Ethiopia's sub-national structure during the study period consisted of 11 states, two of which were chartered cities including the capital city, Addis Ababa. The country has a decentralized health system and districts (woreda) which are the smallest administrative units in in the country, play a significant role in the planning processes for most regions i.e., district (woreda)-based health sector planning. This is part of the Ministry of Health's 'One plan, One budget, and One report' approach (9).

Therefore, sub-national data, stratified by socio-economic variables and geographies, present an opportunity to draw out lessons in regional successes, particularly to provide insights into areas where more pronounced gains have been observed in newborn survival.

1.2 Conceptual framework

The Exemplars in Maternal and Neonatal Health (MNH) study developed a conceptual framework to identify the drivers of the health and survival of mothers and newborns, dividing the interrelated factors hierarchically into distal, intermediate and proximate drivers (Figure 1-2). The framework is designed to identify policies and interventions that target health outcomes (i.e., “things that have been introduced”) but also contextual processes at play in each setting (i.e., “things that are”), recognizing that healthcare access and health outcomes are influenced by circumstances and decision-making outside the health sector. The contextual characteristics and factors in the conceptual framework include the macro-, community- and household/individual levels. Details can be found elsewhere (10).

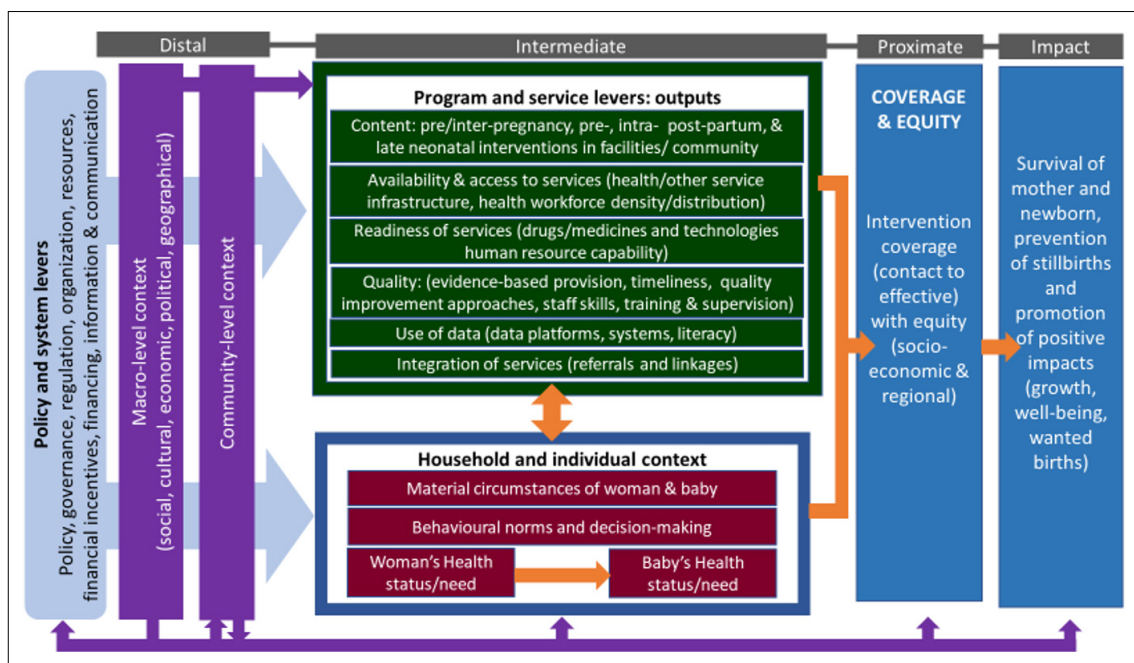


Figure 1-2: Common conceptual framework for the exemplars in MNH study

1.3 Methods

As shown in Figure 1-2 above, a conceptual framework – which was developed to depict how the distal, intermediate and proximate factors linked with impacts such as the survival of mothers and newborns – was used to guide the analysis and synthesis of findings from this study. A mixed methods approach (i.e., both quantitative and qualitative approaches) was utilized to explore these linkages. Extensive reviews of existing articles, reports, documents on national policies and programs and healthcare financing, released since the 1990s, were conducted to map data sources for analysis and to gain further insights on potential factors that might have contributed to the declines in maternal and neonatal mortality.

Criteria-based assessment was conducted to identify and retrieve nationally representative surveys to explore trends and patterns of change in coverage and equity indicators relevant to maternal and neonatal mortality, with analysis done at national and sub-national levels. In addition to synthesis of estimated data from the United Nations-Maternal Mortality Estimation Inter-Agency Group (UN-MMEIG) and the UN-Inter-agency Group for Mortality Estimation (UN-IGME) on maternal and neonatal mortality, national demographic and health survey data was used to explore sub-national trends and geographical disparities in neonatal mortality over the study period. Analysis using Lives Saved Tools (LiST) was performed to estimate the relative contributions of key interventions to the reduction of maternal and neonatal mortality rates.

A method utilized elsewhere was used to decompose the declines in the overall MMR (2000-2017) and NMR (2000-2019) and then quantify the declines attributable to fertility reduction and safe motherhood programs (11). The decline in fertility was assessed both in terms of decline in crude birth rates and changes in age-parity birth risk composition - a proxy measure to estimate the effect of safe motherhood programs. Crude birth estimates from the United Nations, MMR from UN-MMEIG and NMR from UN-IGME were utilized to estimate the impact of fertility.

The Countdown Policy and Program Timeline tool and the Health Systems and Policies Dashboard for Tracer Indicators tool were used to compile and analyze relevant policy, program and health systems information.

Qualitative data was collected using key informant interviews (at both national and sub-national level) to gain qualitative insights on policies and programs relevant to maternal and newborn survival over the study period. A semi-structured and open-ended interview guide was developed to collect the qualitative information. The interview guide consisted of main questions and specific maternal and neonatal health related questions under the main thematic areas.

Program and policy documents, reports and other relevant materials were also collected from the key informants during the interviews. The main opinions and ideas of each participant were coded and recorded under each theme, followed by identification codes given to each participant. The coded summaries of the key informant interview responses were transcribed and translated, and responses from each participant were examined for patterns (commonalities, similarities, and differences). Thereafter, appropriate themes and sub-themes were developed and analyzed.

1.4 Structure of the report

The report chapters present the results of analyses according to the Conceptual Framework (Figure 1-2), moving from right to left. This is to reflect the iterative approach to the analyses, working from observed trends in mortality outcomes, to improvements in intervention coverage, and then investigating hypothesized associations with changes in health services and health policy system levers, as well as relevant contextual factors in Ethiopia over the last 20 years.



MATERNAL AND NEONATAL MORTALITY

Key Points

- Maternal mortality declined by 61% from 2000 from very high levels (1,030 deaths per 100,000 live births) to about 401 deaths per 100,000 live births in 2017. Cause-specific estimates indicate that infectious diseases and abortion-related deaths declined more than other causes of death, but data are limited.
- Neonatal mortality halved from about 60 to 33 deaths per 1,000 live births during the last three decades, with the fastest decline occurring after 2010. However, the most recent survey suggests a stalling of the rate of decline and increasing regional disparities within Ethiopia. Stillbirth rates were estimated to have declined from 36 to 25 deaths per 1,000 births during 2000-2019.
- Infectious diseases such as neonatal sepsis, pneumonia and tetanus made the greatest contributions to the neonatal mortality decline (about 45%), which corresponds with the significant contribution of reductions in neonatal deaths after the first week (53% of total neonatal mortality decline).
- Large inequalities in neonatal mortality by region persisted, especially in the mini-DHS 2019. While rural-urban gaps reduced over time, wealth-related disparities remained large.

2.1 Maternal mortality

Data on levels and trends in maternal mortality are limited. Ethiopia has included a sibling survival module in three DHS (2005, 2010 and 2016) and the national population census also includes questions on maternal mortality. The confidence intervals around these data are large and there is considerable variation in levels.

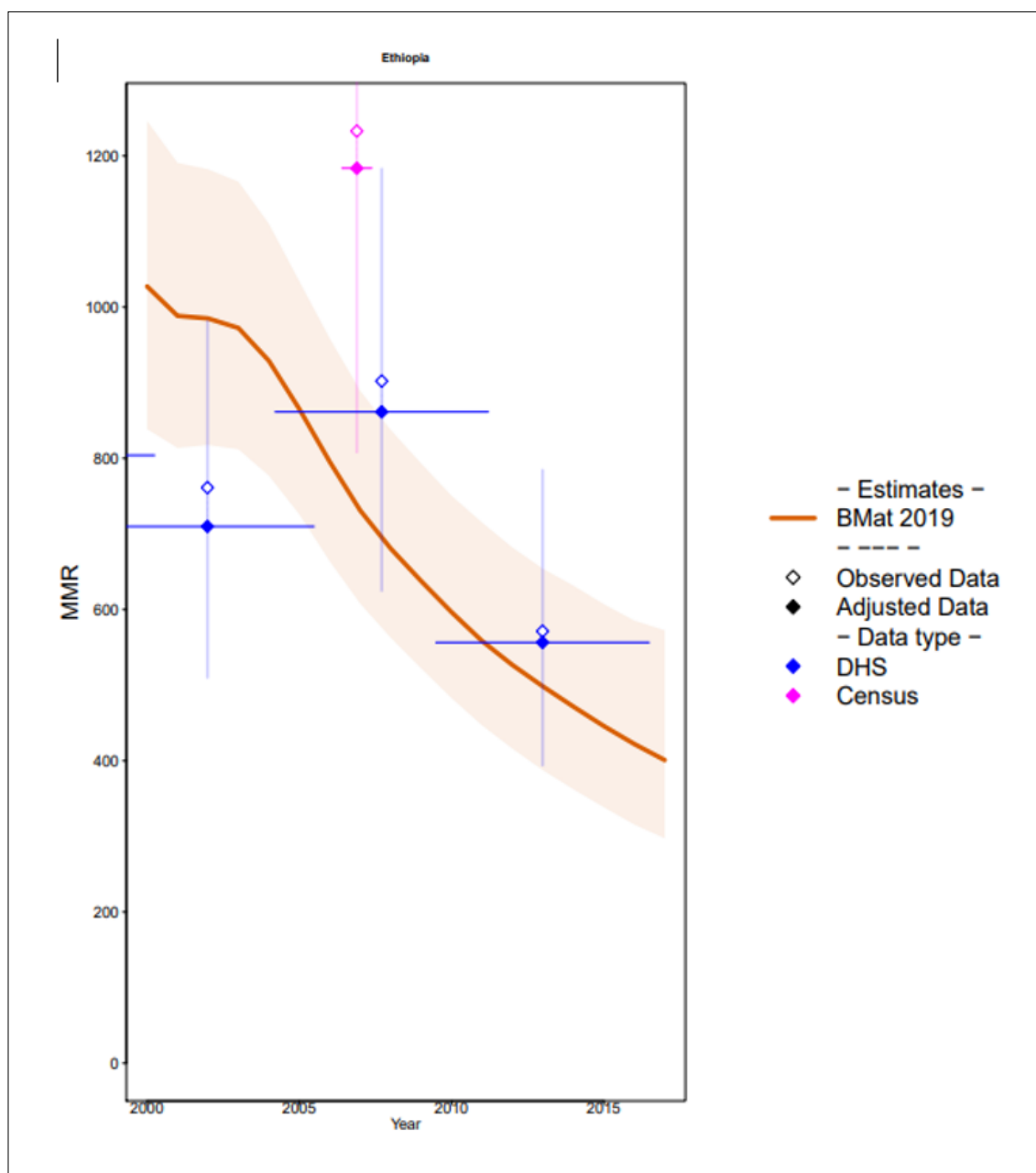


Figure 2-1: Trends in maternal mortality ratio for Ethiopia, including empirical data points, 2000-2017 (Source: UN MMEIG 2017)

According to the modeled estimates of UN-MMEIG (12), the number of maternal deaths declined substantially in Ethiopia, from 30,000 in 2000 to 14,000 in 2017. The MMR is estimated to have declined between the years 2000 and 2017 from nearly 1,030 deaths to 401 per 100,000 live births, a reduction of 61% (Figure 2-1). The greatest decline occurred between 2005-2017 as the maternal deaths almost halved from 865 to 401 maternal deaths per 100,000 live births.

The overall rate of reduction of MMR between 2000-2017 was estimated at 5.5% per year, although it has reduced by 5.7% annually between 2010-2017 (1,12).

Data from the national maternal death surveillance and response (MDSR) system, collected between 2016-2018, suggest that the majority of reported maternal deaths occurred within health facilities, increasing from 69% in 2016 to 72% in 2018 (hospitals - 65%; health centers - 7% in 2018). This reflects increased facility-based deliveries and a greater number of case-based reports coming from facilities. Maternal deaths at home accounted for 17% of reported cases in 2016 and decreased to 13% in 2018, while about 13% of deaths in 2018 occurred during transit. Nearly a quarter (24.4%) of maternal deaths in 2018 was reported as community deaths (i.e., deaths at health posts, at home and on the way to a health facility from home). This represented a decline from 29% in 2016 and is likely attributable to a substantial decline in maternal deaths at home.

Several community-based studies at the sub-national level reported that maternal mortality levels during 2006-2014 were lower than the national surveys and global estimates. The Kersa Health and Demographic Surveillance System in Eastern Ethiopia, reported 324 maternal deaths per 100,000 live births (95% CI: 256-384) for 2008-2014, with a declining trend within the period (13). In a survey conducted in three districts in Tigray, MMR was 266 (95% CI: 198-350) during 2012-2013 (14), while a survey in Gamo Gafo, Southwestern Ethiopia, estimated 425 (95%CI: 318-556) for 2006-2010 (15,16). Based on data collected by health extension workers, MMR was estimated at 489 deaths per 100,000 live births for 2010 in three districts in South Ethiopia.

2.2 Causes of maternal deaths

A systematic review concluded that the main direct causes of maternal death during the 1990-2016 periods in Ethiopia were obstetric complications such as hemorrhages (30% of maternal deaths), obstructed labor/ruptured uterus (22%), pregnancy-induced hypertension (17%), puerperal sepsis (15%), and unsafe abortions (9%) (17). In recent years, hemorrhage has been the leading cause of mortality, followed by hypertensive disorders of pregnancy and sepsis (17). The contributions of obstructed labor and abortion to maternal deaths have decreased over the period. The most reported indirect causes of maternal death were anemia (10%) and malaria (4%).

Recent data from the national MDSR system also confirmed that obstetric hemorrhages continue to be the leading cause of maternal death, accounting for 41% of the total maternal death review reports in 2018 (a decline from 51% in 2014), followed by hypertensive disorders of pregnancy (19% in 2018, an increase from 8% in 2014), obstructed labor/uterine rupture (10%) and sepsis (9%). Anemia was reported to be the leading indirect cause of maternal deaths, reported at nearly 18% in 2018 (a decrease from 20% in 2014), followed by malaria (2% in 2018), cardiac conditions, HIV and tuberculosis. It is worth noting that data from different sources suggest that hemorrhage, obstructed labor/ruptured uterus, pregnancy-induced hypertension, sepsis and anemia have continued to be the top causes of maternal deaths over the past two decades.

The 2018 MDSR report showed that, more than three quarters of maternal deaths due to obstetric hemorrhages occurred during the postpartum period, a pattern that persisted over the 2014-2018 period. The report also indicated that nearly 9 out of 10 (88%) maternal deaths due to obstetric hemorrhage occurred during childbirth (12%) or within 42 days after delivery (76%). More than half (52%) of these deaths were of mothers aged between 25 to 34 years with 55% of them occurring in hospitals. A quarter of them were in their first pregnancy, while more than one-third (35%) of those who died from grand multipara group (mothers who delivered five or more times). The MDSR system data also showed that the contributing factors leading to majority of maternal deaths included failing to recognize the problem, not deciding to go to a health facility, and delayed referrals from home which in turn perhaps led to delayed arrivals at the referral facility.

2.3 Neonatal mortality

National level DHS are the main data source for UN-IGME estimates which this study used to explore levels and trends of NMR at national level. The data on child survival are collected through birth histories, allowing assessments of long-term trends. The NMR has declined steadily from approximately 60 to 50 deaths per 1,000 live births between 1990 and 2000, to 33 deaths per 1,000 live births in 2019 representing the five year period prior to 2019, according to UN-IGME estimates (Figure 2-2). NMR in Ethiopia declined at an average rate of 2.3% per year during 1990-2019. The decline was fastest after 2010 at an average rate of 3.5% per year during 2010-2019, compared to 2% and 2.2% during the 1990-1999 and 2000-2009 periods, respectively. As a result of the NMR decline, the reduction in total fertility and the counteracting effect of population growth, the number of newborn deaths in Ethiopia reduced from nearly 140,000 deaths in 2000 to less than 100,000 in 2019.

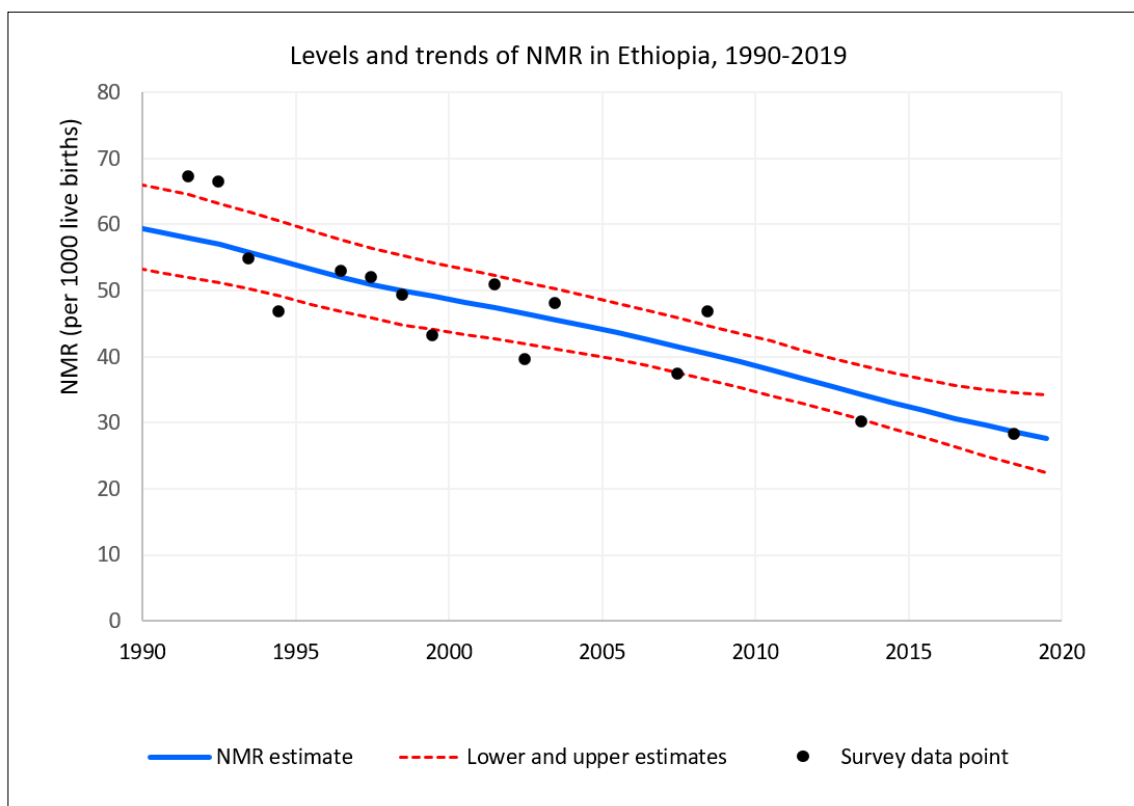


Figure 2-2: Trends in neonatal mortality rates for Ethiopia, 1990-2019. (Source: UN-IGME estimates, 2019).

The mini-DHS in 2019 shows that the neonatal mortality declines may have stalled. In the five years preceding the survey, NMR was 33 deaths (95% CI: 25-41) per 1,000 live births, compared to 29 deaths (95% CI: 23-35) in the DHS 2016 for the period 2011-2016. Despite the recent increase between the two surveys, Ethiopia has been successful in bringing down overall neonatal mortality during the past two decades. New investments and strategies may be required for the country to continue its trajectory of continued overall decline recorded in the past two decades.

2.4 Inequalities in neonatal mortality

Rural Ethiopia, where the majority of the population lives (about 78% in 2020), was the main driver of change, as rural mortality declined faster than urban mortality (AARR: 2.1% in rural areas versus 1.4% in urban areas) (Figure 2-3). The gap between the highest and lowest wealth quintiles remained large as progress among the poorest was only marginally faster than among the wealthiest. The main reductions were observed in the three middle wealth quintiles. Most of the wealthiest households are likely to be from urban areas, and thus a relatively slower reduction of neonatal mortality among wealthy households may be influenced by trends and patterns observed in urban areas.

There are major disparities in NMR between regions which have persisted over time. The comparison of levels and trends is complicated by the larger sampling errors for the NMR estimates. All regions experienced NMR declines during 1990-2017, with average annual rates of reduction ranging between 1.7% and 2.8%. The two outliers were Tigray with the fastest rate of decline (3.9% per year) and Somali with the slowest decline (0.6%) (Figure 2-3).

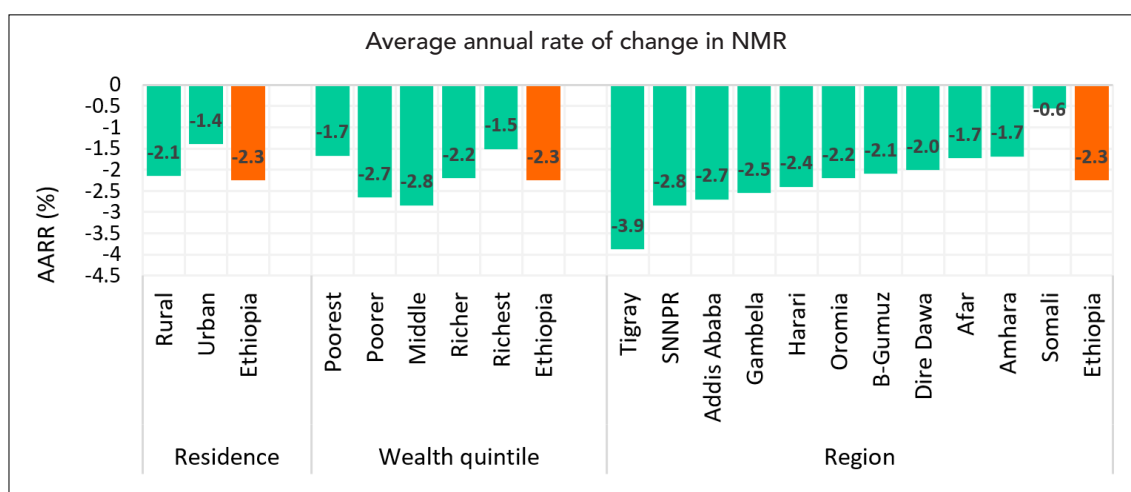


Figure 2-3: Average annual rate of change in NMR (negative value represents reduction) at sub-national level compared to national level average annual rate of reduction, 1990-2017.

This progress has not resulted in major reductions of the gaps between lower mortality regions such as between Addis Ababa, and Somali and B-Gumuz regions (Figure 2-4). The results of the mini-DHS 2019 show greater disparities among regions than in previous surveys, especially compared to DHS 2016, with particularly high mortality rates in Benishangul-Gumuz and Somali regions. Amhara and Oromia, the two regions with the largest populations were important drivers of the national mortality decline, even though their NMRs were still above the national level by 2017. The trends by region have to be interpreted with caution as the confidence intervals are large, mostly of the order of ± 10 -15 deaths per 1,000 live births. In the case of Benishangul-Gumuz region in EDHS 2019, the 95% confidence interval was even larger (31-79 deaths per 1,000 live births). It should also be noted that the mortality rates refer to the five-year period before the survey year.

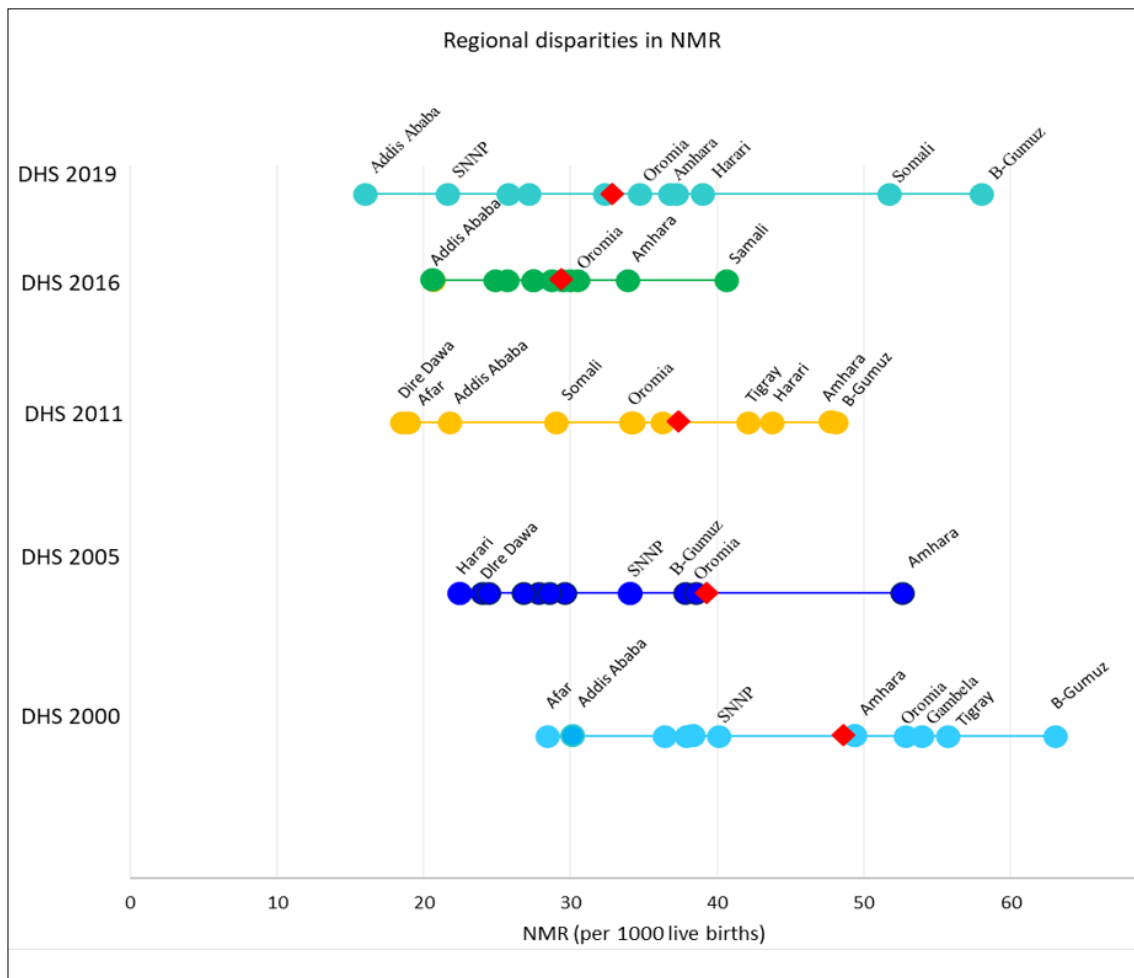


Figure 2-4: Inequalities in NMR between regions in Ethiopia (red diamond represents national level mortality and NMR represents the 5-year period preceding each survey).

2.5 Stillbirths and age-specific neonatal mortality

Stillbirths are known to be underreported in surveys and routine health service reports which include birth histories, and this is also the case in Ethiopia (roughly we expect a stillbirth to early neonatal death ratio of 1.0-1.2). The three surveys conducted in the 2005-2016 period reported stillbirth rates of 10-15 per 1,000 births (Figure 2-5). The most recent UN-IGME estimates of stillbirth rates for 2019 was 25 per 1,000 births, down from 36 in 2000. From the routine HMIS report, the stillbirth rate was between 10 and 14 per 1,000 births in the last 5 years.

Within the neonatal period, first week mortality reduced from 34 to 27 deaths per 1,000 live births over the previous two decades, translating into an average rate of decline of 1.6% per year. The late neonatal mortality rate (LNMR) at 2-4 weeks reduced from 14 to 6 deaths per 1,000 live births, representing an average rate of decline of 4.6% annually during the same period. This rate of decline is nearly three times faster than the early neonatal mortality rate (ENMR) implying that 47% and 53% of the total NMR decline were due to mortality declines in the first week and weeks 2-4, respectively. By 2017, 82% of neonatal deaths occurred in the first week.

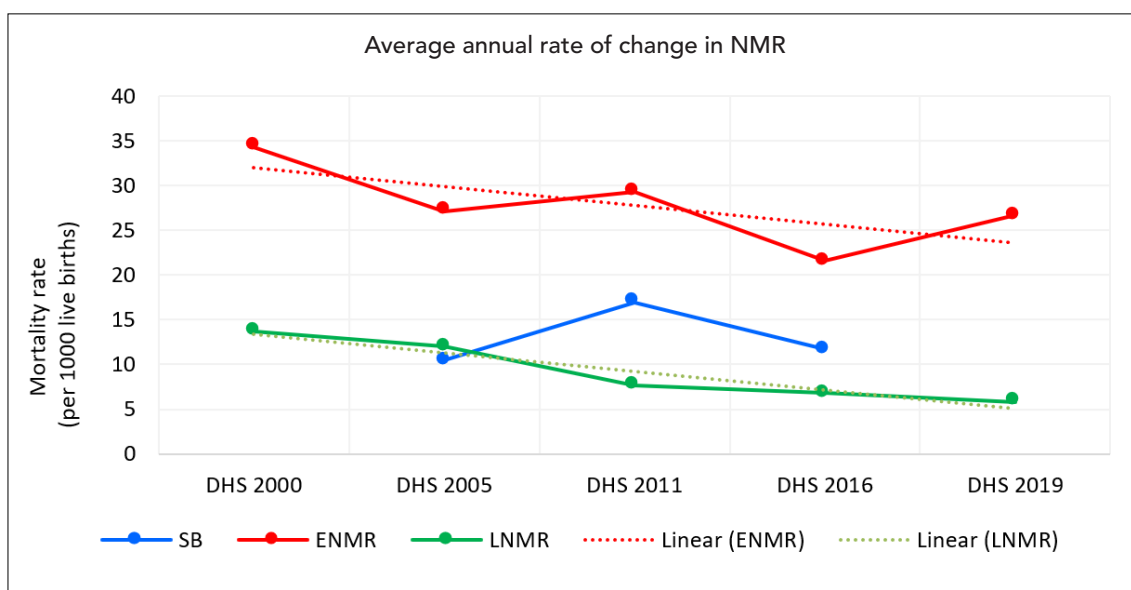


Figure 2-5: Trends in mortality - stillbirths (per 1,000 total births), early and late neonatal mortality rate (ENMR and LNMR) per 1,000 live births, using data representing the 5-year periods from each survey

Urban and rural declines differed, with more pronounced reductions of LNMR observed in urban areas but with little or no change in ENMR. Urban progress in the overall NMR was driven by pronounced decreasing mortality rates at 2-4 weeks to a level of almost zero while first week mortality remained high at 30 deaths per 1,000 live births. Rural NMR decline was driven by a large early neonatal mortality decline and a more modest late neonatal mortality decline.

2.6 Causes of maternal mortality

As is the case globally, most reviews of causes of maternal deaths in Ethiopia highlighted that obstructed labor/uterine rupture, hemorrhage, hypertensive disorders, sepsis/infection and unsafe abortions are the most common complications during pregnancy and childbirth, leading to maternal deaths in Ethiopia (17-20). For the period between 1990-2016, studies have suggested that hemorrhage ranks highest among these complications leading to maternal death, with a prevalence estimated at 30% of deaths, followed by obstructed labor/uterine rupture pregnancy (22%), pregnancy-induced hypertension (17%), sepsis (15%), anemia (10%), unsafe abortion (10%) and malaria (4%) (17).

Figure 2-6 presents data on top causes of maternal death extracted from systematic reviews (17, 20, 21). The data do not allow a careful assessment of the cause-specific levels and trends over time, but they may be used to survey a broad picture of changes over time while maternal mortality levels were declining. The relative contributions to maternal deaths of unsafe abortion and sepsis/infection declined from 31% and 21% respectively during the 1980-1999 periods, to 10% and 13% respectively during the 2000-2012 periods. The reduction in maternal deaths due to unsafe abortions may be attributed, at least in part, to the introduction of a more liberal abortion law in 2005, which was subsequently implemented in 2006. On the other hand, the share of hypertensive disorders and hemorrhages increased from 7% and 12% respectively in the 1990-1999 periods to 19% and 22% respectively, during the 2000-2012 period (20). Recent facility-based reports also demonstrated that hemorrhage, pregnancy-induced hypertensive disorders, aspiration pneumonia and pulmonary edema continued to be leading causes of maternal deaths (22-24).

Maternal deaths due to obstructed labor/uterine rupture – the top cause of death according to the review – increased from 31% in 1980-1999 to 36% in 2000-2012 (20). Studies have also shown that fewer ANC visits, proximity to health facilities for delivery, lack of partographs, maternal age and increase of gravidity all contribute to maternal mortality. Ethiopia’s investment in interventions designed to positively impact these factors such as increasing availability of ambulances, expanding health infrastructures and human resources accompanied by pro-rural development approaches may have improved maternal health outcomes. This suggests that, in addition to improvements in basic maternal health interventions, better infection control and contraceptive use, as well as introduction of the safe abortion law may all have contributed to the reduction in maternal deaths due to unsafe abortions, sepsis and other infections.

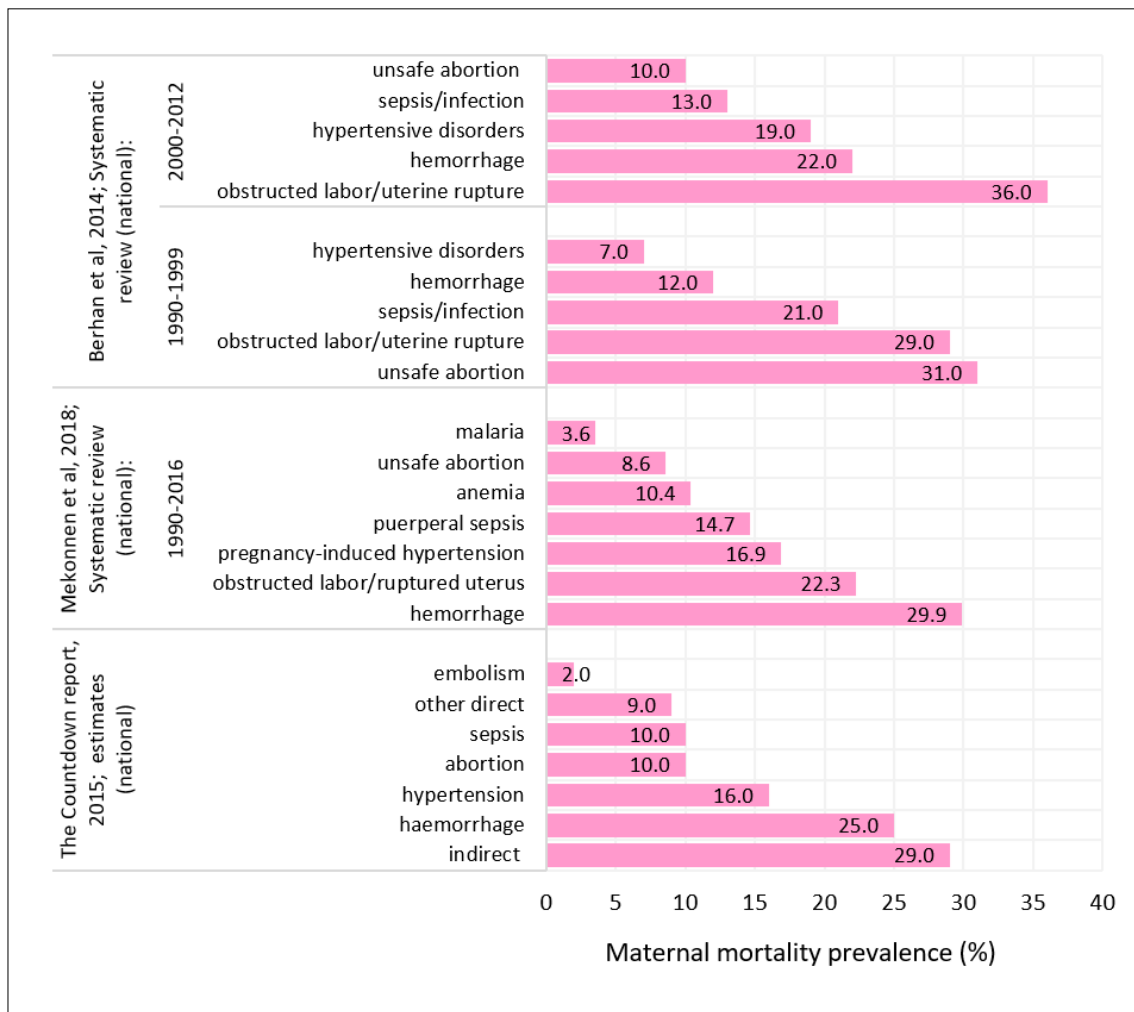


Figure 2-6: Top causes of maternal deaths in Ethiopia over the years since 1990

2.7 Causes of neonatal mortality

Global estimates, combining data on levels of neonatal mortality, data on causes of deaths in Ethiopia (limited) as well as historical data from other countries may provide some insights into causes of neonatal death. Figure 2-7 presents the estimated rates of top causes of neonatal death in the years 2000 and 2019 based on two global efforts: Maternal and Child Epidemiology Estimation (MCEE) and Global Burden of Diseases, Injuries and Risk Factors (GBD) (25,26).

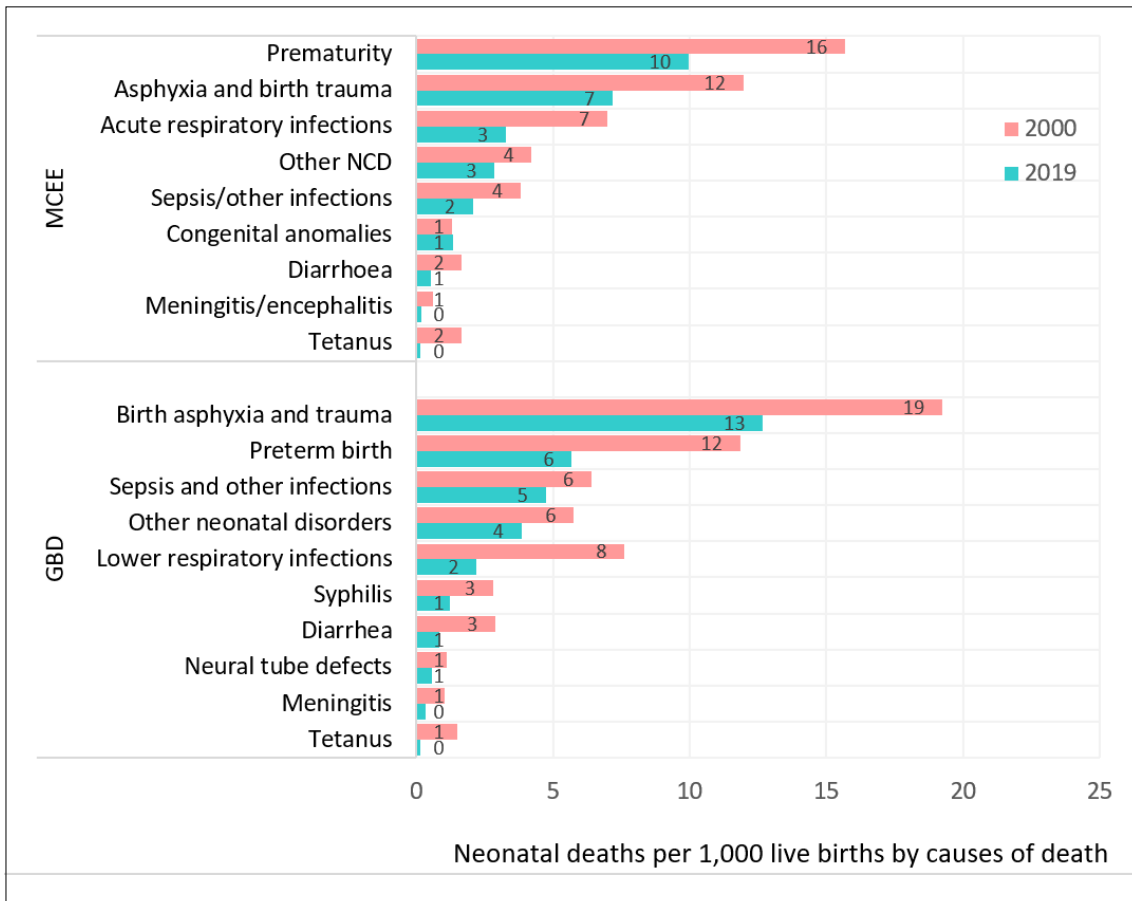


Figure 2-7: Leading causes of neonatal death in 2000 and 2019

Both models attribute about 45% of the decline in NMR to a reduction in infectious disease mortality including neonatal sepsis, tetanus, lower respiratory infections, diarrheal diseases and meningitis. Substantial reductions were also estimated for prematurity and intrapartum causes (asphyxia and birth trauma), the two leading causes of neonatal death, with each contributing about one fourth to the neonatal mortality decline.



COVERAGE AND EQUITY

Key Points

- Coverage of key interventions improved dramatically over the last two decades, including modern contraceptive use by currently married women (from 6% to 40%), four or more antenatal care (ANC) visits (from 10% to 48%), institutional births (from 5% to 45%), and caesarean section (CS) procedures (from 1% to 5%).
- The greatest improvements for most indicators occurred during the 2008-2015 period. Delivery care provided by nurses and midwives rather than physicians, and by health centers (77% of the total increase in delivery coverage) rather than hospitals, drove the increases in numbers.
- ANC with a quality component (timing, frequency and contents of visits) increased alongside rising ANC first visit attendance.
- Breastfeeding initiation within the first hour increased from 47% in 2000 to 52% in 2011 and 72% in 2016.
- The greatest progress in coverage of most reproductive, maternal, newborn and child health (RMNCH) indicators was made in rural areas. Consequently, rural-urban disparities reduced, to a greater degree than the reduction between the highest and lowest wealth quintiles.
- Large regional inequalities persisted for RMNCH indicators, however Amhara, SNNPR and Tigray made greater progress than the national average and gained ground on the high coverage city regions of Addis Ababa, Harari and Dire Dawa.
- Neonatal mortality for health facility births declined by 46% but was still higher than that for home births which was about 30 deaths per 1,000 live births. This implies that a further increase in uptake of deliveries by mainly lower-level facilities without bolstering emergency obstetric and newborn care (EmONC) services may not lead to major reductions in neonatal mortality.

3.1 Family planning and related coverage indicators

Fertility is a critical determinant of maternal and newborn health as it influences absolute numbers of events such as births and deaths as well as the distribution of risk by age, parity and birth intervals for maternal and neonatal survival. Modern contraceptive use (the main factor affecting fertility levels alongside age at marriage) among currently married women increased from 6.3% in 2000 to 40.3% in 2019, representing an average annual rate of increase of 9.4%.

Increases in contraceptive use (both in any and modern methods) were largest among women from rural areas, the poorest households and those whose educational attainment was primary school or lower, with an average annual rate of at least 10% over the past two decades.

Regional increases in contraceptive use were largest in Amhara, SNNPR, Oromia, Tigray, Gambela and Benishangul-Gumuz regions. Increases were more modest in Addis Ababa, Dire Dawa and Harari, while they were small in Afar and Somali regions where levels of use remained low. Contraceptive use among married women in the large population regions of Amhara and Oromia increased more than eight-fold over the two decades. There was considerable reduction in the gaps between regions, except the predominantly pastoralist regions of Afar and Somali (Figure 3-1).

Age at first marriage has been rising in Ethiopia. In the EDHS 2000, 65% of women aged 20-24 years had been married by age 20. This decreased gradually to 62% in EDHS 2005, then 58% in both EDHS 2011 and EDHS 2016. The median age at first marriage among women 20-24 years increased from 18.1 years in EDHS 2000 to 19.0 years in EDHS 2016.

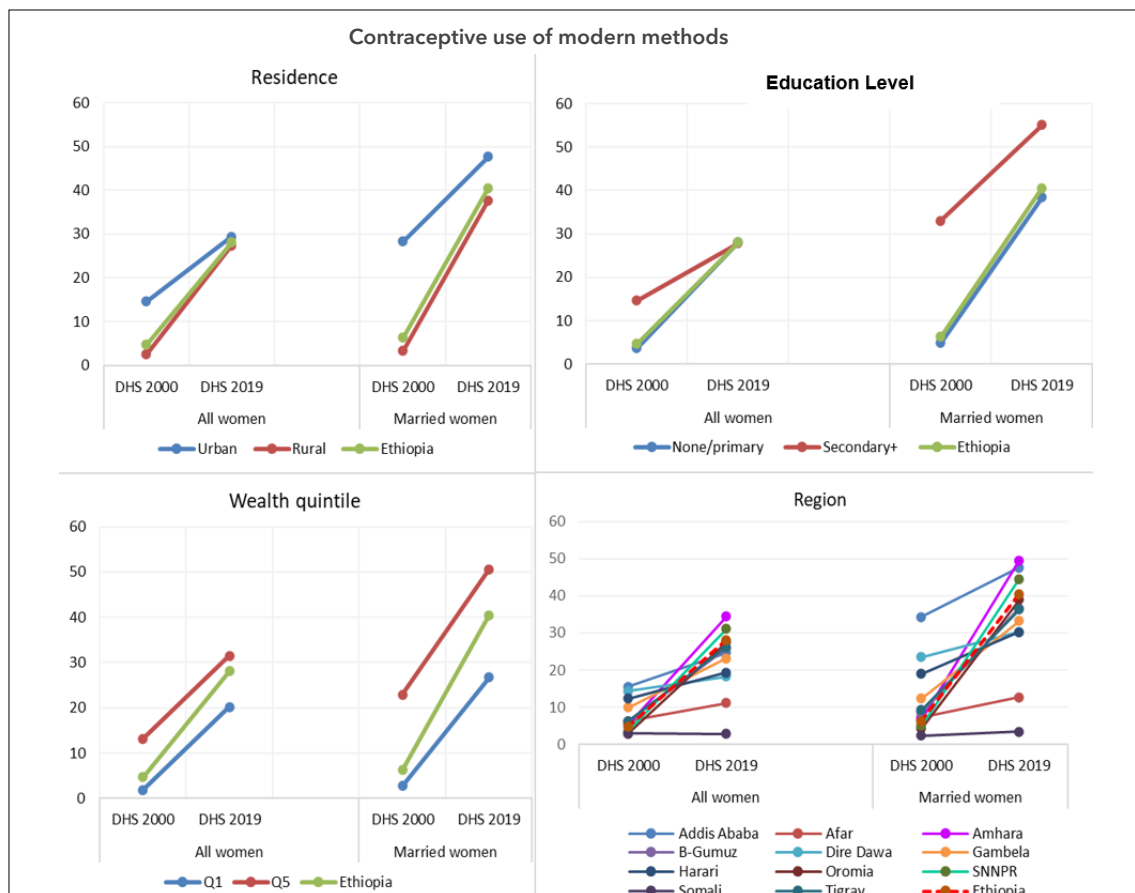


Figure 3-1: Trends in use of modern contraceptive methods among married and all women by background characteristics and region, 2000-2019.

3.2 Antenatal care coverage

The first antenatal care visit (ANC1) is a good indicator of contact with health services. By EDHS 2005, only a quarter of pregnant women made this visit (referring to the period 2000-2005). Between 2005 and 2019, a major increase in ANC1 occurred, rising to 74% national coverage. Rural coverage was 69% but coverage among the poorest was only 48%. The regions below the national average were Somali (31%), Afar (64%), SNNPR (70%) and Oromia (70%). Only Tigray and Addis Ababa attained over 90% coverage.

Antenatal care coverage with at least four visits (ANC4+) refers to the percentage of pregnant women in the five-year period preceding the survey who attended four or more antenatal care visits. In Ethiopia, ANC4+ coverage rose steadily during the 2000-2019 period, rising from 10% in EDHS 2000 to 43% in mini-EDHS 2019 at an average rate of 7.8% annually, while the percentage of women with no ANC visit declined from 73% in 2000 to 26% in 2019 (Figure 3-2). The greatest gains occurred between EDHS 2011 and 2016. Further analysis on the coverage of antenatal care with a quality component - a content-qualified ANC composite indicator (described elsewhere (27)) - which includes the timing, frequency and contents of ANC visits, shows that it increased from 16% to 42%, in tandem with increased first ANC visit attendance.

The increment in ANC4+ was more pronounced among women from rural areas and those with no education as this rose at an average rate of close to 10% annually. By region, the largest increases in ANC4+ coverage were recorded in Amhara, Benishangul-Gumuz and Tigray while by wealth quintile, women in the wealthiest households had a slower rate of increase than all other women (Figure 3-3).

The increase is primarily driven by provision of ANC services by nurses and midwives to pregnant women living in rural areas and the poorest households. The percentage of women in these two categories who received ANC services almost doubled within a decade (from 24% to 46% in rural areas and 16% to 30% among the poorest households) (Figure Annex-2 and Figure Annex-3). There was little or no increase in ANC services provided for pregnant women by doctors in all socio-demographic groups, except among women from the wealthiest households which increased from 20% to 27%.

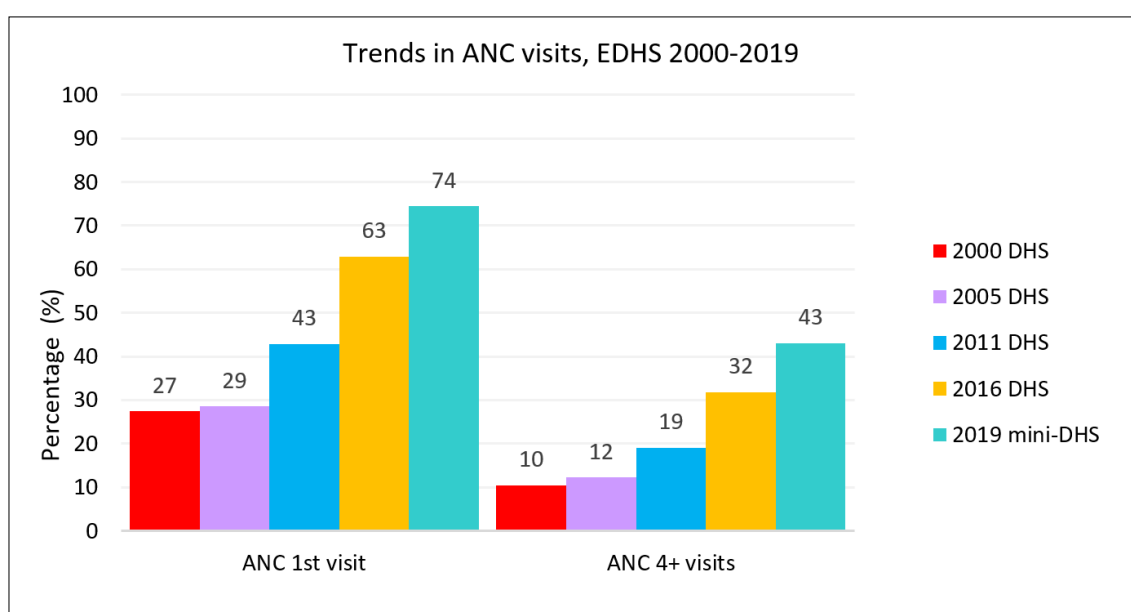


Figure 3-2: Trends in antenatal care (ANC) visits in Ethiopia, EDHS 2000-2019

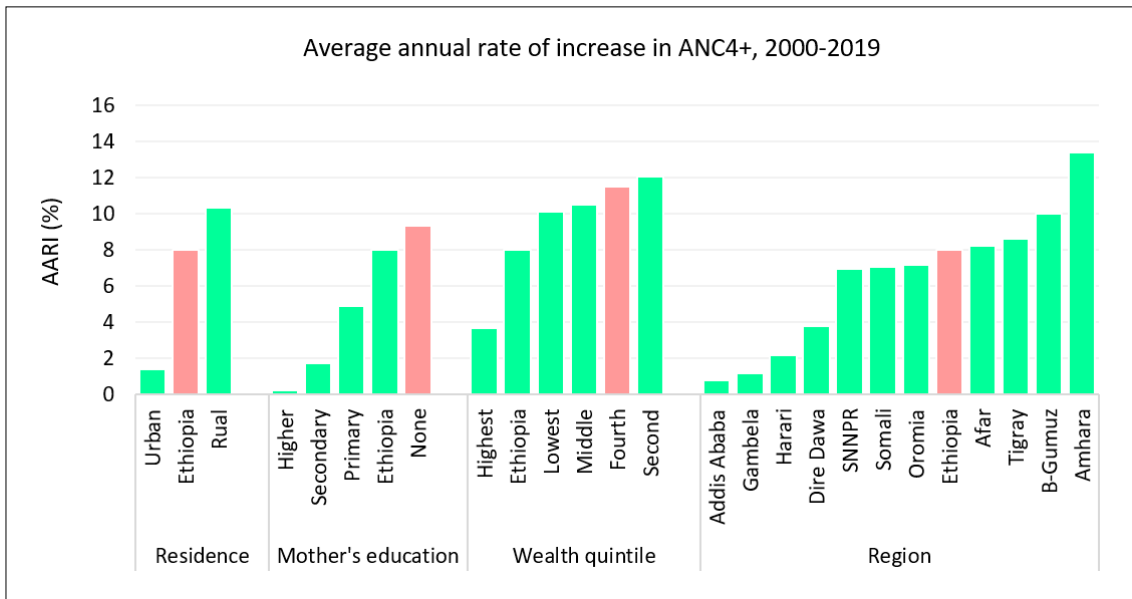


Figure 3-3: Average annual rate of increase of ANC4+ by background characteristics, EDHS 2000-2019

In addition to the facility data (next chapter), recall of specific services during antenatal care visits in the EDHS can be used to obtain an idea of the contents of care. The EDHS data were used to compute ANC coverage with a quality component using a score based on frequency of visits, timely first visit, blood pressure, blood and urine sample and tetanus toxoid (TT) vaccination. The coverage with quality increased from 16% in EDHS 2005 to 25% in EDHS 2011 and 42% in EDHS 2016. Compared to ANC first visit coverage (27% in DHS 2005, 43% in DHS 2011 and 63% in DHS 2016), this data shows slowed growth in increasing the relative quality of ANC care during 2011-2016. Most of the increase in ANC with quality, however, is simply due to more women attending ANC visits and may not necessarily be due to improvements in the actual contents.

3.3 Institutional delivery and skilled attendance

Institutional delivery coverage rose from 5% in 2000 to over 48% in 2019. The rise in institutional deliveries is most pronounced in the period following the DHS 2011 (i.e., after the 2007-2011 period), rising from 10% in 2011 to 26% in 2016 and 48% in the 2019 survey (Figure 3-4).

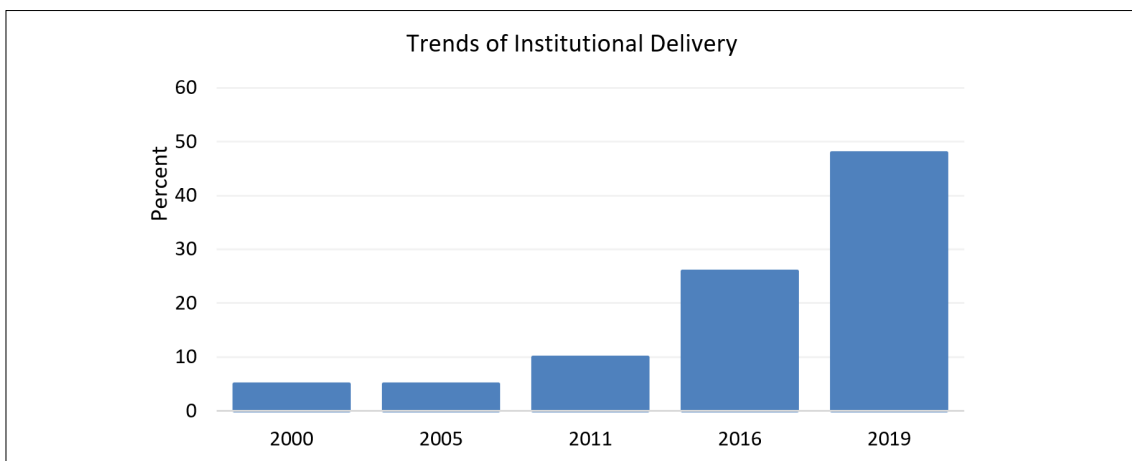


Figure 3-4: Trends in institutional delivery in Ethiopia, EDHS 2000-2019.

This increase in institutional delivery is mainly attributed to increased births at public health facilities. Births at private facilities remained below 5% (Figure 3-5). Lower-level facilities (health centers, private clinics and primary hospitals) were the main drivers of the increase in institutional deliveries, accounting for 2.6% of births in EDHS 2000, 6.1% in EDHS 2011 and 35.4% in EDHS 2019. The proportion of births in hospitals increased from 2.2% in 2000 to 4.4% in 2011 and 13.2% in 2019. Lower-level health facilities contributed 77% of the total increase in institutional deliveries between 2000 and 2019.

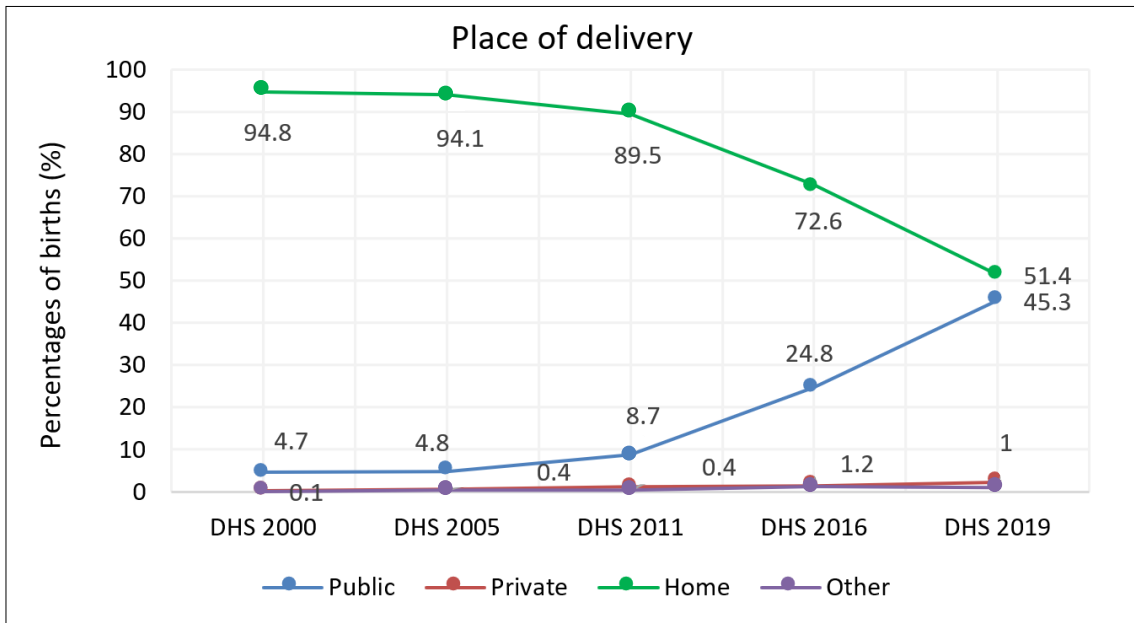


Figure 3-5: Percentage of births by place of delivery, EDHS 2000-2019

The majority of births are attended by nurses or midwives, and this category increased four-fold in the last decade (from almost 7% to 35%), while the proportion of births assisted by doctors increased from nearly 4% to 8%, (increasing at an average rate of 11% annually) (Figure 3-6). Nearly 6% of births were attended by health officers in 2016 (Figure 3-6).

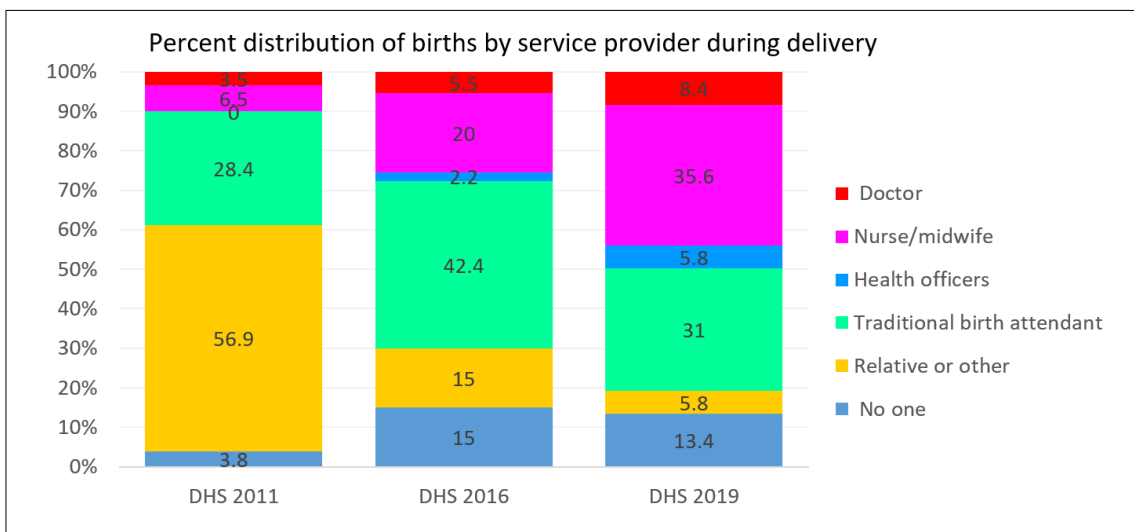


Figure 3-6: Percent Distribution of births by type of service provider during delivery (each data point representing represents 5 the 5-years period before each survey).

Skilled assistance during delivery in rural areas is largely driven by services provided by nurses and midwives relative to other health professionals and this has increased over the last decade. There was little change in the proportion of services provided by doctors among women in all sociodemographic groups except those from the wealthiest households. The percentage of women from the wealthiest households (Q5 in graph below) who delivered with the assistance of a doctor increased from 18% to 29% over the last decade (Figure 3-7). The increase of skilled attendance at national level (from 4% to 8%) was mainly due to the rise in service use among women from the wealthiest households.

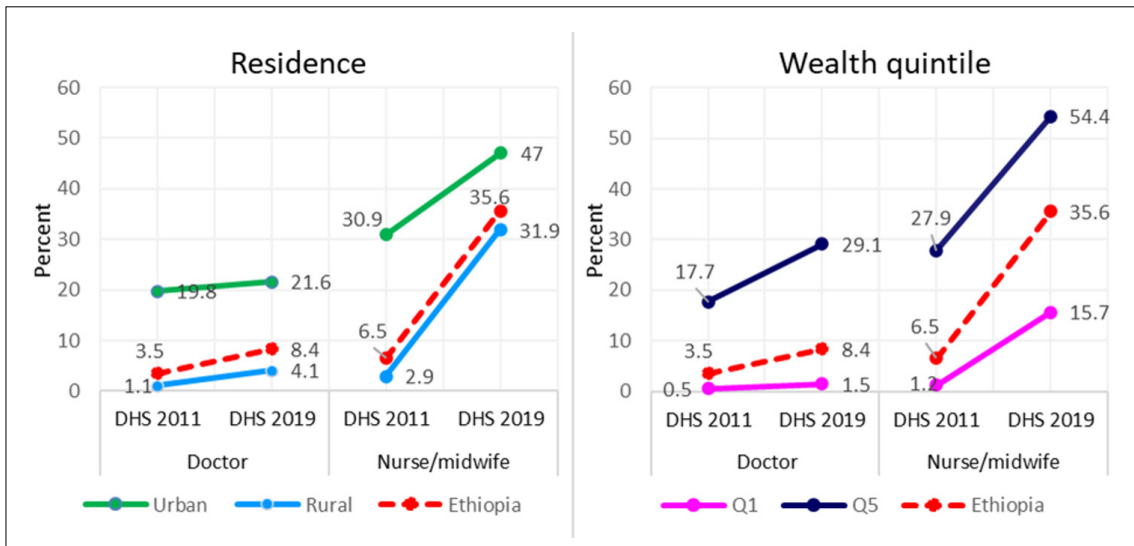


Figure 3-7: Skilled assistance during delivery by background characteristics

Skilled birth attendance increased from 11% to 48% between EDHS 2011 and EDHS 2019 (the figures refer to the five-year period preceding each survey). Major progress was made in all sub-populations, with greater relative increases among women from rural areas and those from the poorest households leading to reductions of the relative inequality gaps (Figure 3-8).

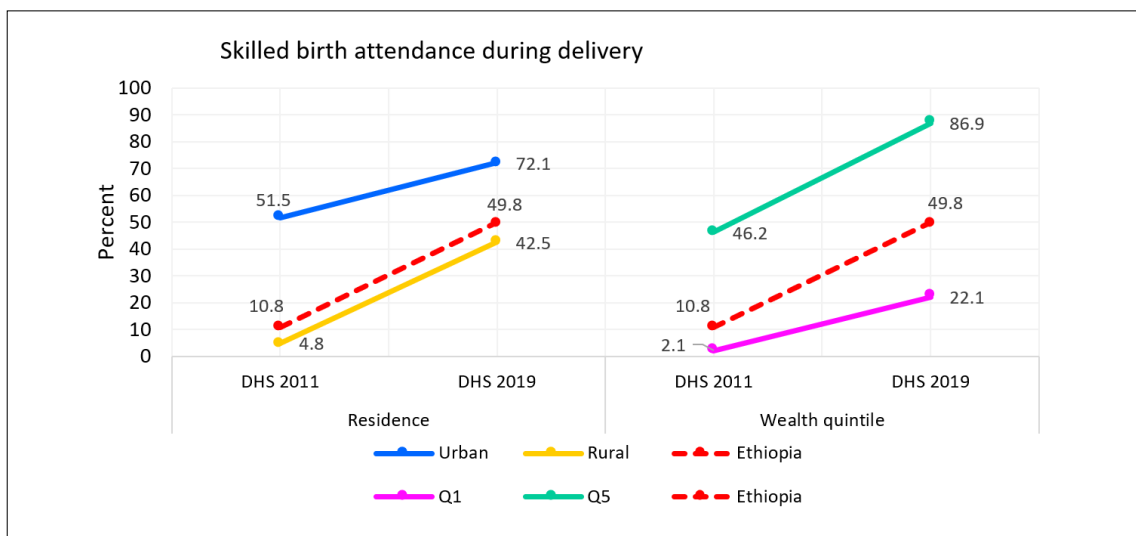


Figure 3-8: Skilled birth attendance during delivery (Q1 and Q5 represent lowest and highest wealth quintile respectively; data for DHS 2019 represents mini-DHS).

There are large regional disparities in skilled birth assistance, with 80% coverage in Addis Ababa followed by another chartered city, Dire Dawa (41%), and then Harari (33%) and Gambela (28%) regions. A significant increase in the percentage of births assisted by skilled professionals was observed in Tigray, where an increase from 13% to 73% (at an average annual rate of 22%) was recorded over the last decade (Figure 3-9). The large inequalities persisted in the EDHS 2019, with Somali and Afar regions lagging behind (26% and 31% coverage, respectively).

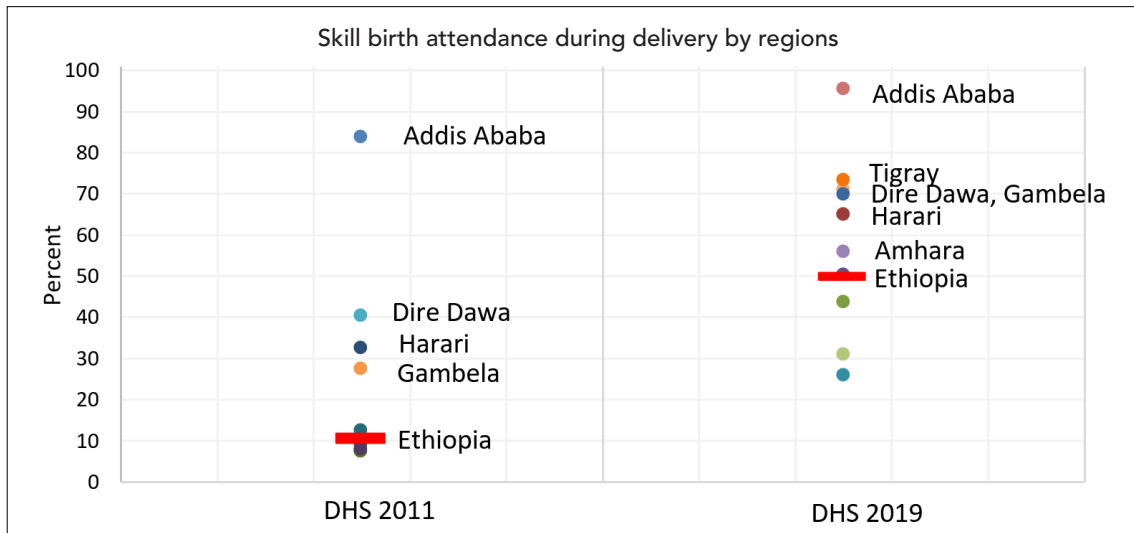


Figure 3-9: Percentage of births assisted by skilled professionals during delivery, 2011 - 2019

3.4 Delivery by caesarean section

Delivery by caesarean section (CS) refers to the percentage of live births in the five years preceding the survey that are delivered by caesarean section. The CS rate increased from close to 1% to a little over 5% of all live births over the past two decades, representing an average annual increase of 11% (Figure 3-10). The main increase in the CS rate occurred in the recent years from 2% in DHS 2016 to a little over 5% in mini-DHS 2019.

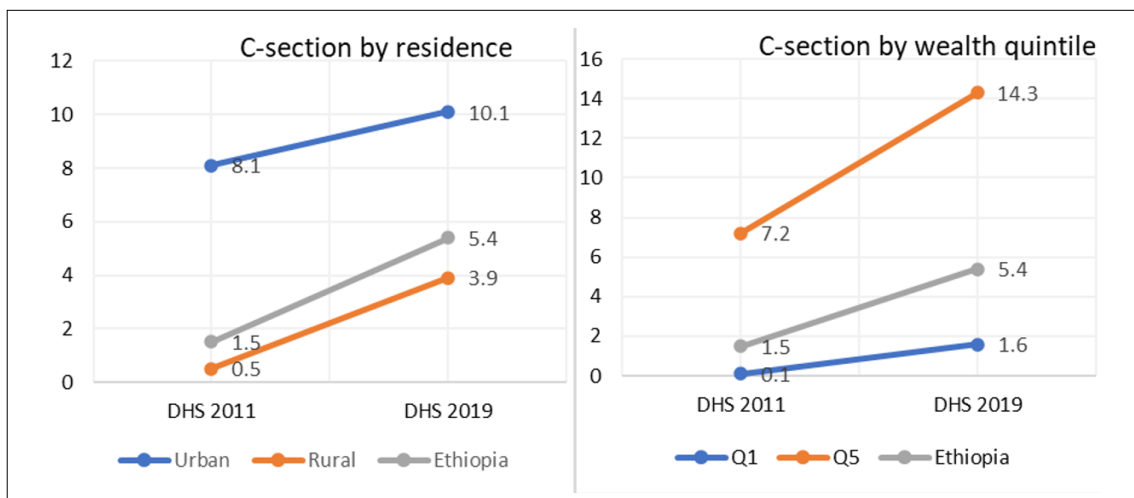


Figure 3-10: Caesarean section per 1,000 live births by place of residence and wealth quintile in EDHS 2011 and EDHS 2019 (Q1=lowest quintile; Q5=highest quintile).

Regional disparities in CS rates were large, with urban areas such as Addis Ababa (24%) and Dire Dawa (16%) exceeding the 10%-15% range recommended by WHO as indicative of met need (28). The fastest increase in CS rates over the past two decades was recorded in the Amhara and Tigray regions. There has been little or no change in CS rates in Somali, remaining below 1%. An eightfold increase in rural CS rates resulted in a major reduction of the rural-urban gap. The CS rate among women from the wealthiest households almost doubled in the past decade - from 7% in 2011 to 14% in 2019.

3.5 Neonatal mortality by place of delivery

Neonatal mortality declined substantially among babies born in health facilities. It reduced by nearly 46% (from 65 to 35 deaths per 1,000 live births) and 66% (from 58 to 20 deaths per 1,000 live births over two decades since 2000) among babies born in public and private facilities respectively. This is in comparison to a much more modest reduction in neonatal mortality among home deliveries over the 15-year period (Figure 3-11). The high neonatal mortality in health facility births in EDHS 2005 was likely due to a relatively large proportion of high risk or complicated deliveries. Increases in more normal deliveries occurring within health facilities, partly contributed to the major mortality decline.

Mortality among home deliveries also declined. Some of this decline may be attributed to high-risk deliveries shifting to health facilities because of increased utilization of services. Neonatal mortality among home deliveries is close to 30 deaths per 1,000 live births, which is somewhat lower than those born in health facilities. This may be related to the reality that most deliveries at health facilities are referrals and high-risk, which may be compounded by limited-service availability and readiness to provide basic EmONC services. This suggests that facility readiness has to improve in concert with increased facility births of high-risk newborns to have maximum impact on newborn survival.

A further increase in uptake of deliveries by mainly lower-level facilities without EmONC services may not lead to major reductions in neonatal mortality.

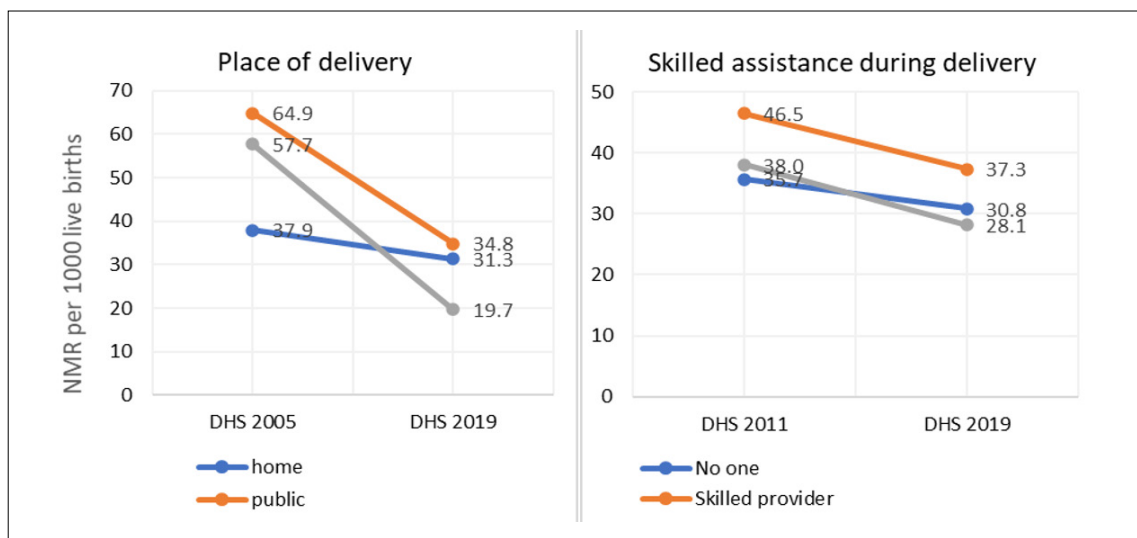


Figure 3-11: Neonatal mortality rates by place of delivery and type of skilled provider during delivery, 2005 - 2019

3.6 Breastfeeding practices

The initiation of breastfeeding within the first hour increased from 47% in EDHS 2000 to 52% in EDHS 2011, rising to 73% and 72% in the 2016 and 2019 surveys respectively. The proportion of newborns breastfed within the first day increased from 73% in EDHS 2000 to over 92% and 91% in the last two surveys. Exclusive breastfeeding among babies 0-6 months old has also increased from 49% in EDHS 2005 to 52% in EDHS 2011, rising to 58% in EDHS 2016 and 59% in mini-DHS 2019. Relatively better progress has therefore been observed since EDHS 2005.

3.7 Mother's and newborn's first postnatal check-up in the first two days after birth

The first postnatal care (PNC) visit for mothers (or newborns) refers to the percentage of women giving birth (or percentage of last births) in the two years preceding each survey who had their first postnatal check-up within the first two days after birth. The trend of mother's (or newborn's) first postnatal check-up has increased over the last decade. In 2018 (i.e., for the two years period preceding the 2019 mini-DHS), a little over one-third of women and newborns received their first PNC check-up within the first two days after birth, an increase from nearly 7% for women and 0.3% for newborns in 2010 (Figure 3-12).

The closing of absolute gaps in PNC coverage for women and newborns is perhaps attributable to the substantial increase in coverage recorded for newborns from urban areas (increase from 1% to 48%) and the wealthiest households (increase from 1% to 60%) in the last decade. According to the 2019 survey, PNC coverage for mothers and newborns in rural areas was about 29% while it was lowest (13%) for those from the poorest households.

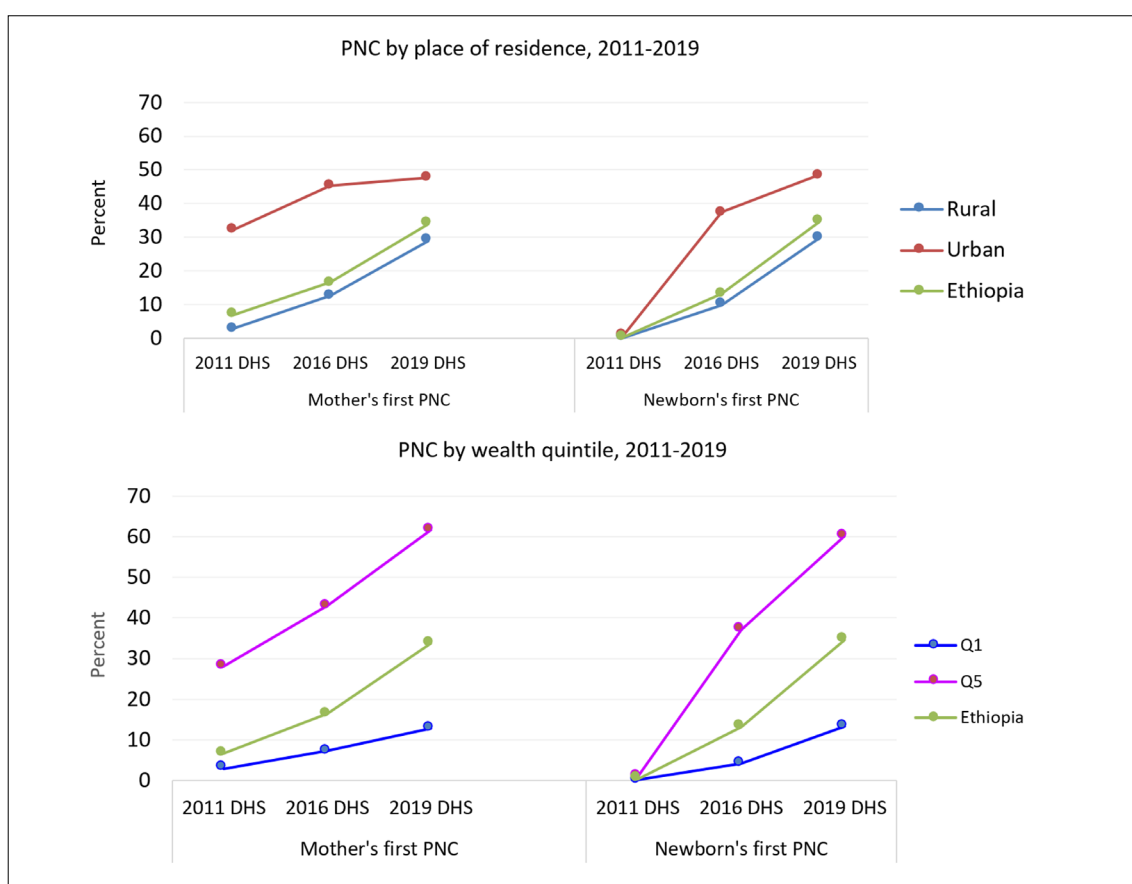


Figure 3-12: Trends of postnatal care within 2-dys after birth, 2011-2019 (Q1=poorest (20%) and Q5=richest (20%))

According to the 2019 survey, about 60% of women and 62% of babies delivered at health facilities had their first PNC visit within two days after birth, while the PNC coverage for women who delivered and babies born at home remained below 3%. Tigray recorded relatively better performance in PNC coverage, increasing from 13% in 2011 to 63% in 2019 for mothers and from nearly 1% to about 56% for newborns in the period between the surveys conducted in 2011 and 2019. Unlike many other regions, the PNC for mothers in Tigray continued to be higher than newborns. The PNC coverage for newborns in Addis Ababa surpassed that of mothers. The two pastoralist regions, Afar and Somali, continued to record low PNC coverage during the last decade (Table 3-1).

Table 3-1 : Percentages of Mother's and newborn's PNC coverage after birth, 2011 - 2019

	Mother's first PNC check-up (%)			Newborn's first PNC check-up (%)		
	2011*	2016*	2019*	2011*	2016*	2019*
Addis Ababa	47.7	55.4	73.5	2.4	46.1	84.4
Afar	6	11.6	23.5	0.6	6.5	25.8
Amhara	5.1	18.4	39.8	0.2	11.4	41.7
B-Gumuz	6.5	14.5	45	0.6	14.7	44.7
Dire Dawa	18.7	27.8	48.2	0	27.1	47.8
Gambela	16.9	18.8	55.1	18.4	2.6	56
Harari	28.4	37.4	45.1	2.4	34.8	46.9
Oromia	5	9	26.1	0.1	8.4	28.1
SNNPR	5.5	16.9	32	0.5	14.2	30
Somali	5.4	10.3	11.9	0.1	13	11.6
Tigray	13.1	45.4	63.3	0.6	31.2	55.5
Ethiopia	6.7	16.5	33.8	0.3	13.1	34.5

*Year of survey and data represents the two-year period preceding each survey.

3.8 Maternal and neonatal lives saved by intervention - LiST analysis

The Lives Saved Tool (LiST) estimates the number of lives saved that can be attributed to specific interventions.

3.8.1 Neonatal lives saved by interventions

The cumulative number of neonatal lives saved by intervention during the 2000-2019 period was approximately 121,940. Over two decades, about one-third of neonatal lives (40,754) were saved by curative-related interventions after childbirth (34%) while an additional 33% and 23% of neonatal lives were saved by interventions during pregnancy and at birth, respectively. The leading interventions were case management of neonatal sepsis/pneumonia (33.4%), followed by tetanus toxoid vaccination (about 31.2% contribution to the overall additional lives saved), followed by case management of neonatal sepsis/pneumonia, neonatal resuscitation and caesarean delivery (23%) and (Figure 3-13).

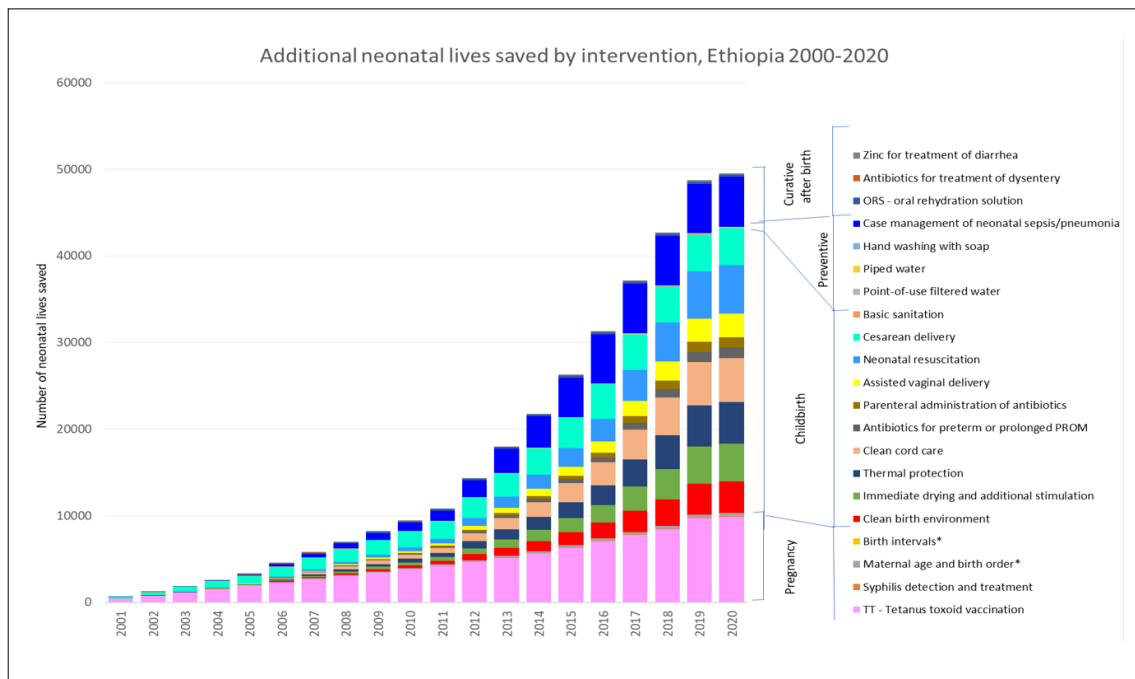


Figure 3-13: Additional neonatal lives saved by intervention in Ethiopia, 2000-2020.

The proportional contribution of childbirth interventions to saving neonatal lives increased over time (from 39% in 2006 to 66% in 2019), while the proportional contribution of pregnancy-related interventions dropped from 52% in 2006 to 21% by 2019. More neonatal lives were saved by childbirth-related interventions over the last two decades (estimated at 32,368 neonatal lives saved by 2019) which may be related to increased deliveries at health institutions.

The tetanus toxoid (TT) vaccination is often used as a marker for ANC visits, as a woman would have to attend two ANC visits to be immunized. The TT vaccination could therefore also be an indication of the contribution of ANC visits (29). National coverage for TT immunization is about 49% while coverage for ANC with at least two visits increased from 58% to 71% according to the two most recent DHS results (30). These highlight that there may be some missed opportunities to save more lives since more women than those who received TT immunization reported attending at least two ANC visits.

The contribution of TT in the reduction of neonatal mortality may have been achieved through high TT vaccination rates and clean cord care. By 2000, neonatal mortality due to tetanus was estimated at 1 to 2 deaths per 1,000 live births, while by 2017, it was declared eliminated. Vaccination during ANC played an important role, even though the availability of TT vaccine was as low as 42% in 2014, according to data from Ethiopian Service Provision Assessment (ESPA). In the EDHS 2016, 47% of women had received at least two doses during pregnancy and 49% of women had lifetime protection, up from less than 17% in EDHS 2000. This perhaps highlights that targeted vaccinations may have played a major role. Data suggests that, during the 10-year period between 1999-2009, high tetanus toxoid vaccine of two doses or more (TT2) coverage was achieved in three rounds of supplemental immunization activities conducted in 59 high-risk zones. The TT2 coverage ranged from 76% to 94% within each zone.

3.8.2 Maternal lives saved by interventions

The cumulative number of maternal lives saved by various interventions was estimated at 51,488 over the two decades between 2000-2019. A larger number of maternal lives were saved by pre-conception interventions such as contraceptive use and safe abortion delivery (38,992 maternal lives saved over two decades). Over the twenty-year period, the proportion that was saved by contraceptive use was 75% (about 38,572 maternal lives saved), followed by Caesarean delivery (11.4%) and Hypertensive disorder case management (9.5%) (Figure 3-14).

More maternal lives were saved by childbirth related interventions over the last two decades. The proportional contribution to additional maternal lives saved by childbirth related interventions increased from approximately 21% in 2006 to 62% in 2019, while maternal lives saved by pre-conception intervention, principally contraceptive use, has reduced from 74% in 2006 to 34% in 2019.

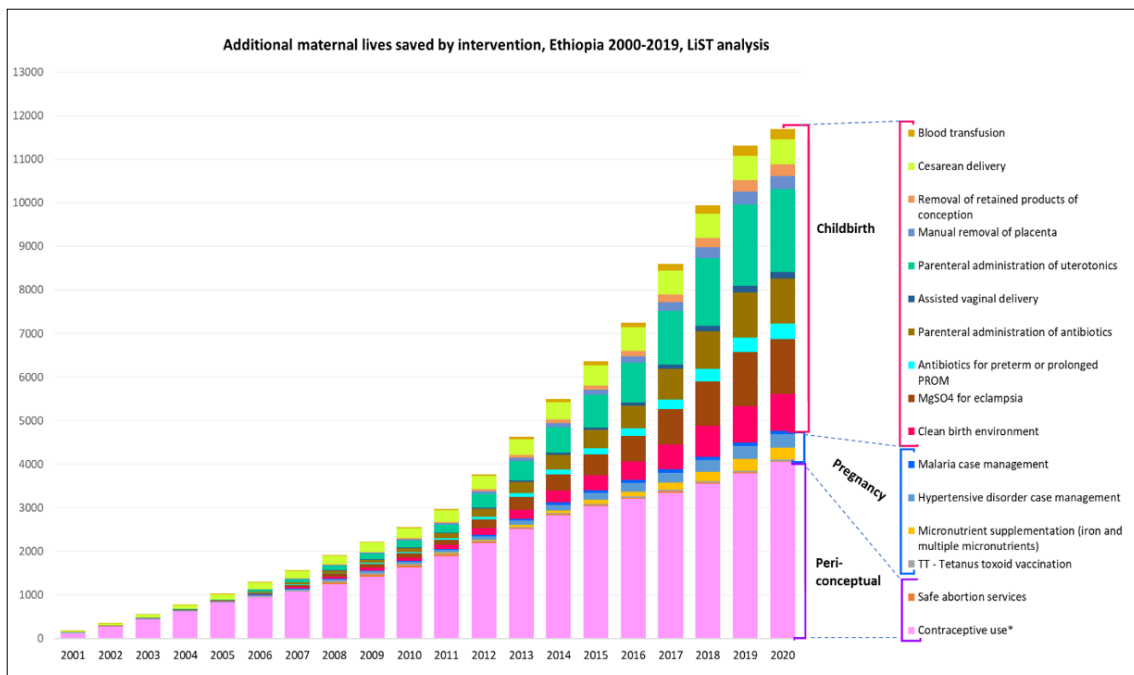


Figure 3-14 : Additional maternal lives saved by intervention



PROGRAM AND HEALTH SYSTEM LEVERS

Key Points

- The Health Extension Program, initiated in 2003, led to major increases in demand for and access to health services, especially in rural Ethiopia, and most notably from 2008-2010.
- Demand creation and community-based services: These included the rapid scale-up of Health Extension Workers from 2005 to 2009, rising to almost one worker per 2,300 people and the involvement of the Health Development Army (HDA) as well as the Women's Development Army (WDA) to address demand side issues from 2011.
- The health infrastructure was expanded dramatically, targeting health posts first (2003-2011), then health centers (2008-2014) and finally hospitals (from 2014). This was accompanied by the improved availability of ambulances for emergency transport and the gradual increase of maternity waiting homes, reinvigorated by policy guidance in 2015.
- The health workforce expanded in multiple directions as training and deployment of health professionals was stepped up from 2003. This led to major increases in the density of nurses and midwives from 2008-2010 and physicians from 2014. Task shifting to address the shortage of surgical workforce (IESO) was also done from 2012
- During the 2008-2016 period, the proportion of hospitals (comprehensive) and health centers (basic) with emergency obstetric and newborn care (EmONC) increased from 11% to 40% while the number of hospitals offering abortion services rose from 36% to 42%. Service readiness improved for tracer items such as magnesium sulphate, oxytocin as well as bags and masks for neonatal resuscitation as did hospital capacity for CS operations and blood transfusions. Major gaps remain though, especially for neonatal care of small and sick newborns.

4.1 Health extension program

By 2000, Ethiopia had very low coverage of primary healthcare services including essential maternal and newborn health services. Expanding access to primary healthcare (PHC), particularly in rural areas, was a government priority. The Health Extension Program (HEP) was developed by the government to become the main vehicle for achieving universal coverage of PHC interventions (2). The initial focus was on agrarian communities, and this was later scaled up to pastoral (2006) and urban communities (2009).

The HEP achieved notable successes, specifically in family planning, immunization, ANC, malaria, TB, HIV, hygiene and environmental health, and community engagement in health. There has been increased health service utilization; improved knowledge and care seeking behavior of mothers for common childhood illness; increased latrine construction and utilization; enhanced reporting of disease outbreaks; and, high levels of community satisfaction (31,32).

In the qualitative section of the study, key informants were asked about the main reasons for the improved trends in maternal and neonatal health experienced over time. The key informants participating in the study agreed that the declining trend seen in maternal and neonatal mortality over time was mainly due to the increasing coverage of health facilities. One informant illustrated how the expansion of health facilities contributed to mortality trends until 2015: *'...the data shows me that the Health Extension Program, expansion of health posts and health centers, expansion of hospitals, [increase] in ambulance and healthcare provider numbers have helped us get here, but the data clearly show that after 2015, the work of the health system has been stalled...'*

The core focus of the HEP is to identify and provide a list of essential health services for health promotion, disease prevention and provision of basic curative services to households at the community level. The HEP initially included 16 health packages for essential health services, including: Disease Prevention and Control, Family Health Service, Hygiene and Environmental Sanitation, and Health Education and Communication (Figure 4-1). The major objectives of the HEP are to reduce morbidity, disability and mortality, through strengthening and gradually expanding family planning services, nutrition services for mothers, children and youth and, increasing the coverage of hygiene and environmental health services among the population at large. This is in addition to increasing community awareness in health through the involvement of communities and provision of continued health education to bring about positive changes in people's knowledge, attitudes and behavior (33).

Health extension workers (HEWs) are the primary mechanism through which the HEP is implemented within communities. Upon completion of their 12-month training, HEWs are assigned as salaried government employees to health posts and work directly with households. HEWs are expected to map households, prioritize community health concerns, draft a plan of action, and provide health services through static and outreach activities. They are expected to spend 75% of their working time conducting home visits and outreach activities while 25% of their time is at the health post providing basic curative, promotive and preventive services (33,34). However, a recent evaluation of the program has suggested HEWs are becoming more stationary as they spend more time at health posts (50% according to one study) and less within the community (32).

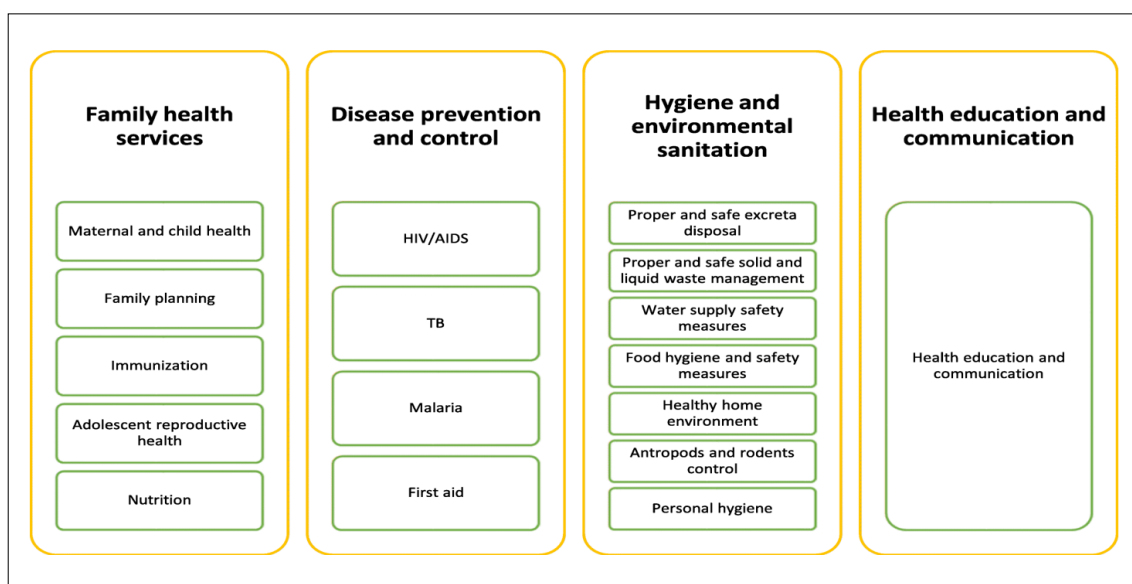


Figure 4-1: Packages of the rural health extension program of Ethiopia (HEP Roadmap)

The HEP and the roles and responsibilities of HEWs have evolved since their inception in 2002. With each successive Health Sector Development Program (HSDP), the HEP expanded, first to pastoralist settings in 2006 and then to urban settings in 2009 (20). Integrated community case management (ICCM) was introduced nationally in 2012 and the community-based newborn care (CBNC) implemented in 2014 (20). The original health packages have also now expanded to 18 packages and include modules on non-communicable diseases (NCDs) and curative care (20).

Most respondents from the qualitative group suggested that the HEP had been particularly critical to the improvement of maternal and newborn health. For example, an informant attributed maternal and newborn mortality reductions to the introduction and implementation of the HEP:

'...The HEP is a program we are proud of, that helped to bring these changes. Since it improves access to the community, I believe designing the HEP brought a big change in bringing a sharp decline on maternal, infant or under-five mortality...if you ask me to select one program, I firmly say that the results are attributed to the HEP. If the HEP was not implemented, we couldn't have achieved these results...'

Another informant acknowledged the health extension workers' contributions to maternal and newborn health: *'...maternal and newborn mortality reduction ... is also the result of the Health Extension Program. The work of the extension workers isn't easy. It helped mothers to use family planning...to use ANC, to be treated, to identify her problems and get treatment...it helped pregnant mothers and her child not to die by encouraging them to go to health centers or hospitals...'*

The HEP implementation is supported by key actors and initiatives beyond the HEWs, including model households (MHHs or model families), Health Development Army (HDA)/Women's Development Army (WDA), ICCM, Maternal and Newborn Health in Ethiopia Partnership (MaNHEP), the community, and the government. Model households are those households trained in HEP packages who implement these packages after the training and are able to influence their neighbors to adopt the same practices (34).

The HEP has also faced challenges since the launch of the program. There have been resource gaps, including for medical equipment and drugs; limited supportive supervision; absence of a well-established referral system; high turnover of HEWs; absence of clear career structure for HEWs; and an unattractive salary scale (31,32,35). Community members have also reported limited opening hours of health posts, frequent absences of HEWs as well as disrespectful care as reasons for not seeking services at health posts (36).

4.2 Health infrastructure

The primary care level of the Ethiopian health system consists of a primary hospital, a health center and five health posts that act as satellites and together form a single primary healthcare unit (PHCU) (HSDP-IV). The PHCU provides healthcare services to an average population of 100,000 (32, 34, 37). Two HEWs are assigned to one health post to serve a population ranging from 3,000 to 5,000 in a kebele (village). The health center serves as a referral center for the health post. The health post used to be under the supervision of the district health office previously, but this structure of supervision is currently done by the catchment health center which includes a technical support as well and the kebele administration which is the smallest administrative unit in the country (33, 38). A primary hospital provides emergency, in-patient and ambulance services in addition to acting as a referral site for health centers.

The expansion and upgrading of existing health facilities as well as construction of new health facilities have been intensively implemented over the last decade. The priority has been construction of health posts and the strategies pursued in health facility construction include participation of communities and promotion of ownership. To meet the huge demand in health infrastructure, a program for accelerated expansion of health facilities was formulated and implemented during HSDP-III period.

To achieve universal coverage - defined as the availability of functioning PHC facilities to 85% of the rural population - by the end of 2009, Ethiopia called for the construction and equipping of 3,118 health centers and 12,249 health posts. This involved the construction of 563 new health centers and upgrading of 2,167 health stations to health centers, along with the downgrading of 135 health stations to health posts.

Health posts were the first to expand from 2 to 19 per 100,000 people from 2003 to 2012, reaching a level of almost one health post per 5,000 people in 2012. Since then, there have been no further increases (Figure 4-2). The density of health centers started to increase rapidly from 2008 until 2012 with about one health center per 27,000 people while hospital density increased from 1.5 per one million people in 2014 to 3.5 per million in 2020.

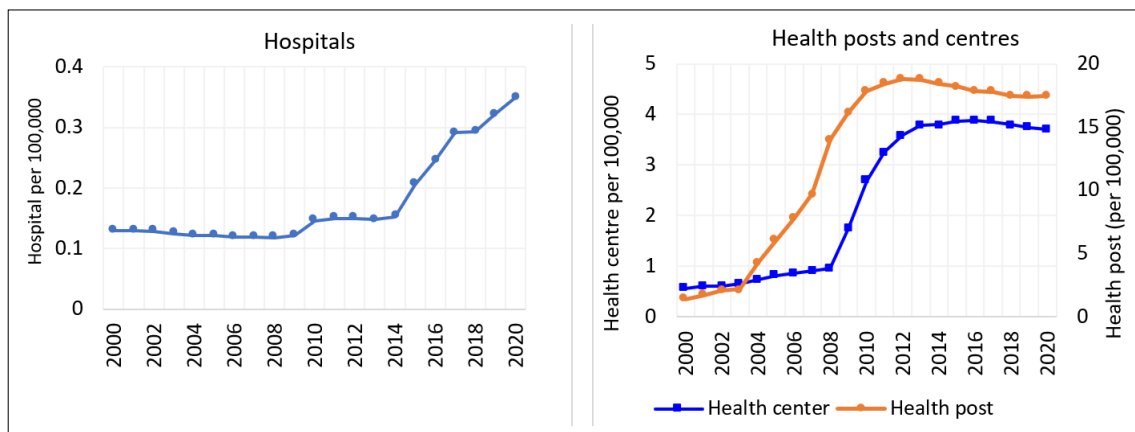


Figure 4-2: Trends in density of health facilities in Ethiopia, 2000-2020

4.3 Ambulances

Access to services, including referrals, was improved by providing all districts with 1-2 ambulances. Their number reached 4,011 with 85% of them remaining functional in 2021. There were also significant advances in infrastructure (road network) at the same time (Chapter 5).

Health facility assessments showed that emergency transport availability was high for hospitals and health centers (Table 4-3). For instance, data from the Service Availability and Readiness Assessment (SARA) 2016 suggested that nearly 99% of hospitals and 84% of health centers had ambulances. The exception was the EmONC 2016 report which recorded low availability of health centers (13%) probably due to a stricter definition of the term 'on site'. For instance, in the ESPA 2014, health centers indicated that it would take an average of 46 minutes to reach the emergency transport station. Research has shown that the ambulances were used frequently and this had positive effects on outcomes (39).

Over the last two decades, there has been a significant increase in government funding for road construction and many roads have been constructed leading to improved access to health services, especially in rural areas. Both the length and quality of the road network increased, from under 20,000 km in 1991 to over 63,000 km in 2012. The road network has also shown an average annual growth rate of 9.35% between 1991 and 2009 (8). Since 1997, there has been an initiative called Universal Rural Roads Access Program (URRAP) which aims to connect each district and sub-district in Ethiopia. This has enabled the ambulance service to reach more remote areas as this respondent said:

'...Access to roads and ambulances significantly reduced mortality. The construction of roads helped pregnant mothers to reach health facilities in less than two hours otherwise a bleeding woman dies in two hours...'

Another participant added: *'...The rural population lives sparsely and far from health facilities. Even if we have ambulances, we still need roads...with road developments, it is possible to bring mothers to health facilities easily...'*

There had also been improvements in the coverage of Ethiopia's ambulance services. Participants reported that in the past, there were only one or two ambulances per designated zone. As these ambulances were owned by the Red Cross, it was common for pregnant women to go to health facilities using public transportation. To tackle this problem, the Ministry of Health started an initiative to provide at least one ambulance per district. The Ministry has managed to allocate one ambulance per district for 1,000 districts using a matching fund, where the Ministry of Health provides 50% of the funds required and districts provide the other 50%. Participants also noted that a few ambulances were provided by development partners. Additionally, Ethiopia's Ministry of Health has been endeavoring to supply one ambulance per health center, resulting in around 3,000 ambulances being distributed. Despite these initial successes, some problems remain. Districts are expected to maintain and fuel their ambulances through their budgets, and some respondents reported that several ambulances were not functioning due to financing problems or that they were being used wrongly. Though the expansion of ambulance services is widespread, the alternative of using 'traditional ambulances' was considered to be viable in some districts. 'Traditional ambulances' are wooden stretchers used to transport mothers to health facilities that do not have an ambulance or where the road network for ambulance-use is poor. A respondent noted: *'...there is also a culture of using traditional ambulances...when there is a health problem for the woman, they carry and bring her to a health facility...we are recommending they construct these before an emergency incident, health problem or labor happens so that they can immediately bring the woman to the health facility...'*

4.4 Maternity waiting homes

Waiting homes and rooms for pregnant mothers were constructed in different parts of the country in or around health facilities where there are obstetric services as free temporary residences for women in their last weeks of pregnancy. These waiting homes and rooms are expected to aid birth preparedness and enable postnatal follow-up visits.

Maternity waiting homes (MWHs) have been used to improve the skilled and institutional delivery services which are principally provided at health centers and hospitals in some of the regions. To standardize the rapid national expansion of MWHs, the Ministry of Health revised their guidelines in 2015 to also cover other women who are not considered at elevated risk of complications. In the 2016 EmONC assessment, 56% of health centers and 18% of hospitals had maternity waiting homes. Several studies have documented a subsequent positive impact on skilled birth attendance and health outcomes (40,41).

Although the coverage of MWHs is high in some regions such as Oromia, their utilization is hindered by structural barriers and financial constraints that restrict women's travel. This is in addition to restrictive cultural issues and societal norms on the users' side. Participants reported that waiting rooms are particularly important for pregnant mothers who live far from health facilities and in areas that are inaccessible to ambulances. Waiting homes and rooms have been found to be helpful for mothers with pregnancy complications or threatening signs that call for close observation by health professionals. This would target complications such as postpartum hemorrhage and preeclampsia which often become life threatening. Participants reported that waiting rooms were a very helpful strategy:

'...you cannot open a clinic at each corner...it is one of the best strategies, other than building facilities everywhere; the mother just comes here and returns after giving birth here...therefore, maternity waiting rooms are very good...'

Respondents also reported high levels of acceptance of these waiting homes and rooms, as they are designed to resemble home environments. They offer recreational activities, meals and home utensils. As one respondent said:

'...It is like a full-fledged home. Everything is there. If she delivered there, there is porridge. There is also TV. All family members come with her and support. They can make coffee ceremony and prepare food...' These findings support those from previous studies (8,40).

4.5 Human resources for health

An adequate number and mix of skilled health professionals is critical for the attainment of population health goals. Health professional density level is a key criterion to measure health sector staffing (42). Alongside the investment in health infrastructure, Ethiopia also invested in health workforce development and deployment, improved availability of equipment and essential medical supplies, and increased responsiveness to population health needs. Given the country's emphasis on expanding primary healthcare services, there was a focus on growing the low and mid-level health workforce.

Human resources have increased in line with health facility expansion in terms of the number and the mix of health professionals including midwives, nurses, public health officers and medical doctors, as well as specialists in these disciplines. According to study respondents, the number and mix of health professionals trained and deployed over the last 20 years has contributed to increased abortion and family planning services, ANC visits, and institutional deliveries including CS services, thereby reducing maternal and neonatal mortality. One participant noted:

'...About 16,000-plus health posts were opened and around 34,000-plus HEWs were deployed. These have brought a significant reduction of maternal and neonatal mortality...'

The recent deployment of midwives and medical doctors at the lower levels of the health system was mentioned as a particularly important contribution to maternal and neonatal death reductions. Additionally, since there is a shortage of physicians, the Ministry of Health designed an accelerated public health officers training program, undertook innovative IESO and medical approaches with the deployment of at least one public health officer to every health center. Nationally, the number of physicians graduating from medical schools has increased over time.

This has contributed to improvements in the type and quality of health services available at health facilities. One of the respondents highlighted that:

'...twenty years ago, we had a limited number of professionals. For example, we never had midwives; ... I think the biggest change is due to increments in numbers of professionals and the professional mix...'

Capacity building of the health professionals through continuous in-service training was another area of focus, especially over the last five years. This included catchment-based clinical mentorship programs such as the 21-day Basic Emergency Management Obstetric and Newborn Care (BEmONC) training. Other programs of note were the Accelerated Midwives' Training Program, the Accelerated Nursing Program, the Anesthetists' Training Program, and short-term programs such as the Maternal and Perinatal Death Surveillance and Response (MPDSR) training run by the WHO.

A human resource development plan was first implemented during the HSDP-I Period, a program initiated in 1997/98 and further expanded during HSDP-II (2002/03-2004/05) and HSDP-III (2005/06 - 2009/10). As a result of HSDP-II and III, and the policy to expand medical education so as to increase health workforce between 2003-2011, there was a substantial increase in the number of core health professionals (physicians recorded since 2010 (after six years of training), nurses after 2006 and midwives since 2008). Major increases in the number of HEWs were recorded from 2005.

Strategies for the development of human resources included scaling up physician, nurse and midwife training and deployment, accelerated training of health officers, training of IESO and strengthening the capacity of the existing health workforce by initiating and strengthening continuing education and in-service training. It also included developing and implementing effective mechanisms to motivate and retain health workers by expanding existing training institutions, as well as the training and deployment of government-paid female HEWs (34,43).

The strategy required expansion and coordination of health provider training and the development of appropriate policies for staff retention. This major health workforce expansion was combined with concrete targets and strategic initiatives included in the subsequent HSDPs III and IV implemented from 2007-2015 which started expanding the country's medical schools as well as increasing the annual enrolment numbers of medical students, physicians, and midwives (43,43). The Ministry of Health undertook multiple initiatives to manage the healthcare workforce including task-shifting, improved retention schemes, organization and management of services as well as improved governance at the decentralized levels (44). Focus was given to the phased scaling up of the pre-service education capacities for members of the health workforce with higher levels of demand and in line with the national health workforce development plan (44).

4.5.1 Core health professionals

The increase in health workforce density occurred first among nurses (from 2005), followed by midwives (from about 2008) and health officers (from 2007) and then physicians (from 2009-10) (Figure 4-3). In 2000, there was one nurse for 8,036 people (1.2 per 10,000 people), by 2020, this had improved to one nurse for 1,473 people (6.8 per 10,000 people). For General Practitioners and specialists combined, in 2000, there was one for 45,435 people (0.2 per 10,000 people). This improved to 8,448 in 2020 (1.2 for 10,000 people). For midwives, in 2000 there was one for 71,093 people (0.2 per 10,000 people) which by 2020 this had grown to one for 5,053 people (2.0 per 10,000 populations). There has been a significant increase in the number of other healthcare professionals, such as pharmacists, laboratory professionals and environmental health professionals. The overall number of core health professionals (physicians, nurses, midwives) per 10,000 people increased from 1.6 to 10.0 which represents a sixfold increase but is still far from the WHO 2016 indicative threshold of density of 44.45 health workers per 10,000 people (45). The skills mix (nurses and midwives to physicians) was 9 in 2000 and 10 in 2017, with a peak in 2010 when the scale up of physicians had not yet started.

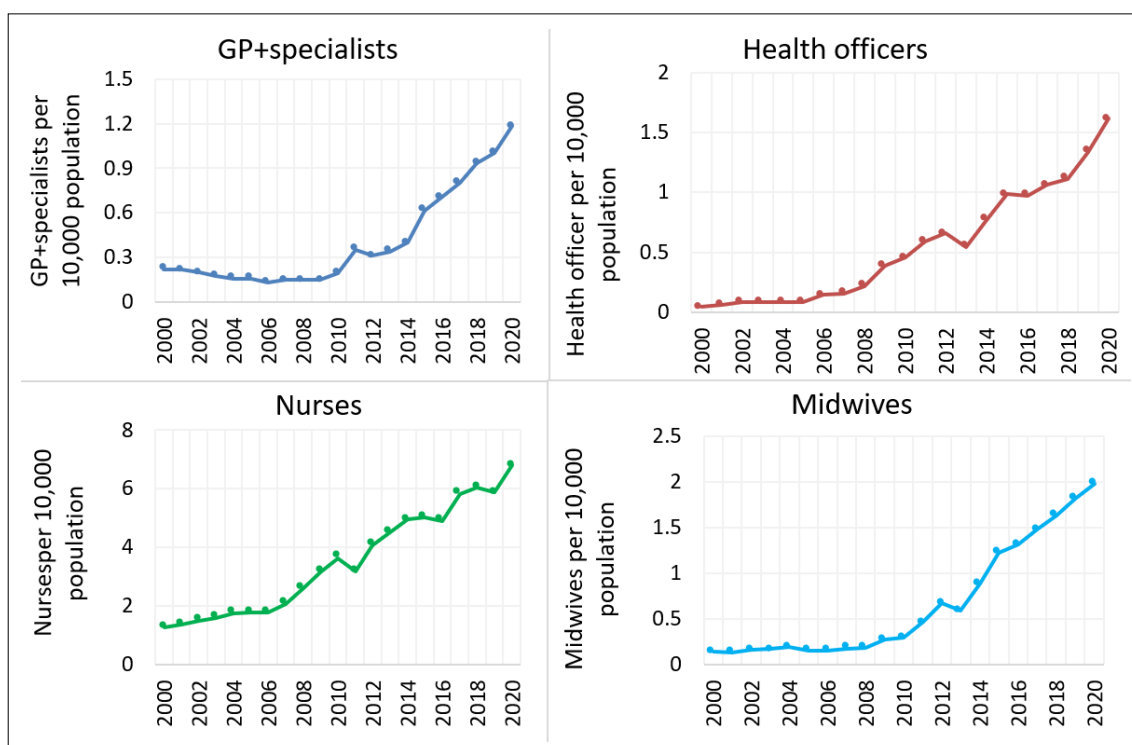


Figure 4-3: Trends in health workforce density in Ethiopia, 2000-2020.

The density of health professionals varies by region. In 2020, the density of physicians per 10,000 people ranged from 0.4 in Afar to 2.7 in Dire Dawa, 2.9 in Harari and 8.2 in Addis Ababa. The highest density of physicians was recorded in regions that are predominantly urban. The 2020 physician density in the two most populous regions, Oromia and Amhara, was about 0.6 and 1.1, respectively. The density of nurses (per 10,000 population) was lowest in Oromia (4.8), Somali (5.1), Amhara (5.5), and Afar (5.5) regions. The density of midwives per 10,000 people ranged from 1.2 in both Gambela and Oromia to 1.3 in Afar to 4.9 in Benishangul-Gumuz, followed by 4.1 in Harari and 4.0 in Addis Ababa. Table 4-1 presents the density of health professionals at sub-national level. The highest absolute increases in density of core health professionals (physicians, nurses and midwives) over the past two decades were recorded in Tigray, Gambela, Benishangul-Gumuz regions. The gaps remained large. The national increase was close to the more modest increases in the two largest population regions of Amhara and Oromia (Table 4-1 and Figure 4-4).

Table 4 1: Trends in density of health professionals (per 10,000 people) at sub-national level, 2000-2010 (GP stands for General Practitioners).

Table 4-1 : Trends in density of health professionals (per 10,000 people) at sub-national level, 2000-2010 (GP stands for General Practitioners).

Region	GPs + specialists			Health Officers			Nurses			Midwives		
	2000	2010	2020	2000	2010	2020	2000	2010	2020	2000	2010	2020
Tigray	0.2	0.2	1.6	0.1	0.7	1.9	2.4	5.8	11.3	0.4	0.5	2.7
Afar	0.1	0.1	0.4	0.1	0.3	1.2	1.9	3.3	5.5	0.2	0.1	1.3
Amhara	0.2	0.1	1.1	0.1	0.4	1.5	1.0	2.6	5.5	0.1	0.2	2.4
Oromia	0.1	0.1	0.6	0.1	0.4	0.9	0.8	3.4	4.8	0.1	0.3	1.2
Somali	0.1	0.2	1.1	0.0	0.2	1.1	0.9	3.5	5.1	0.1	0.5	2.9
B-Gumuz	0.4	0.3	0.9	0.2	1.1	1.9	3.6	7.0	13.9	0.4	0.3	4.9
SNNPR	0.1	0.1	0.9	0.0	0.4	2.1	0.9	2.4	7.3	0.1	0.3	2.1
Gambela	0.4	0.4	1.4	0.4	1.4	2.9	6.1	8.7	23.1	0.7	0.1	1.2
Harari	3.2	2.0	2.9	0.1	2.1	2.0	9.7	13.0	15.4	0.9	2.2	4.1
Dire Dawa	1.2	0.9	2.7	0.1	1.3	1.3	3.8	9.4	8.9	0.3	1.3	2.1
Addis Ababa	2.1	1.5	8.2	0.1	1.0	7.7	5.0	13.6	23.7	0.5	0.7	4.0
Ethiopia	0.2	0.2	1.2	0.1	0.5	1.6	1.2	3.6	6.8	0.1	0.3	2.0

*Note: all density values are rounded to one decimal place (i.e., 0.0 values do not necessarily mean zero density).

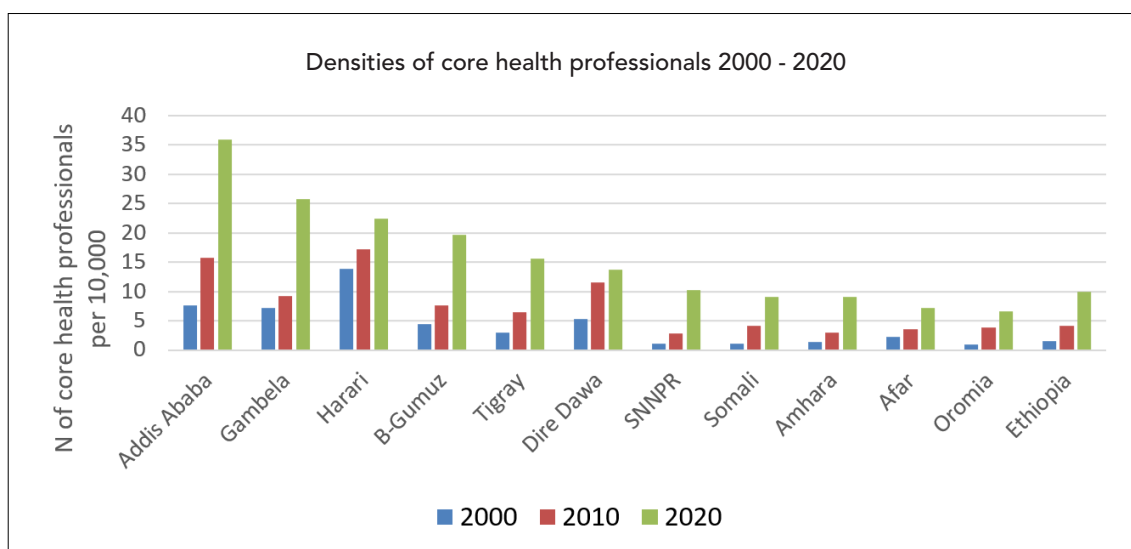


Figure 4-4: Number of core health professionals (physicians, nurses, midwives) per 10,000 population, by region, 2000, 2010 and 2020.

4.5.2 Health extension workers

After the first deployment of the HEWs, there was one HEW to provide health services to 26,688 people in 2005. As more HEWs were trained and deployment increased over time, the ratio of HEWs to the general population improved. The deployment of HEWs ramped up from 2005 (one HEW for 26,687 people), to about one HEW per 2,545 people by 2009, eventually reaching one HEW for 2,363 people by 2017.

Following the first deployment of HEWs in 2005, the lowest density was one HEW for 34,888 people in the Oromia region followed by one HEW for 25,942 people in the Amhara region. This was in contrast to one HEW for 3,869 in Harari region. The trends in HEW density improved over time. In 2017, this had shifted to one HEW for 10,350 people in Benishangul-Gumuz region, one HEW to 748 people in Gambela and one HEW for 275 people in Harari. Similarly, in 2017, the HEW densities in Oromia and Amhara regions – the two most populous regions – were one HEW for 2,550 and 2,262 people, respectively.

The General Service Readiness Index of health posts led by HEWs was 59%. On average, about two-thirds (67%) of health posts had basic amenities to provide services, 81% had basic required equipment, 42% had standard precautions for infection prevention, 47% had diagnostic test capacity for malaria rapid diagnostic tests and 58% had essential medicines. This indicates that the HEP is able to provide basic health services for child and maternal health (35). However, the availability of basic amenities remains low which may affect the quality of maternal and child health services provided at health posts.

4.6 Health Development Army

Launched in 2011, the Health Development Army (HDA) of community volunteers became part of the Health Extension Program. HDA is inspired by military structures and builds on the model households. It is a woman-centered community organization that requires the establishment of health development teams of up to 30 households which are further divided into smaller groups of six members, commonly referred to as one-to-five networks. (34,46). The HDA approach was deployed rapidly and by 2013 it was estimated to cover close to 13 million households. The combined effect of the HDA and WDA with HEWs contributed to major increases in uptake of maternal health services and associated declines in maternal and perinatal mortality between 2011 and 2016 (47,48).

4.7 Surgical officers

Caesarean section operations are usually the most common major surgical procedures and require a large workforce with surgical competencies. The shortage of physicians has been a major bottleneck to increasing CS procedures across the country. The creation of the IESO cadres in 2009 was a critical adaptation to improve access to CS in rural areas through task shifting to address the country's surgical workforce shortage. The IESO cadre of non-physician surgical providers – 1 per 100,000 by the end of 2014 – performed emergency surgical, gynecological and obstetric procedures at 800 primary level hospitals by 2015. Almost all hospitals provided CS procedures at the time of the EmONC assessment in 2016.

4.8 Availability and readiness of services

The extent to which the policies and plans led to increased service availability, utilization and quality can partly be assessed through the health facility assessments that were conducted in 2008 (Emergency Obstetric and Newborn Care assessment), in 2014 (Ethiopia Service Provision Assessment (ESPA)), in 2016 (Emergency Obstetric and Newborn Care assessment), as well as the Service Availability and Readiness Assessment (SARA) in 2016 and 2018. The samples differ and direct comparisons should only be done with great caution.

Antenatal care was offered by almost all health facilities, including health posts, health centers and hospitals, in the 2014-2018 assessments (Table 4-2). There were major gaps in readiness in all three assessments with a downward trend for the selected items such as hemoglobin test during pregnancy.

Table 4-2: Selected readiness indicators for antenatal care from facility assessments, 2014-2018

	ESPA 2014	SARA 2016	SARA 2018
Number of facilities	1165	698	764
Antenatal care offered (%)	87	80	78
At least one ANC trained staff (%)	54	44	31
Blood pressure apparatus present (%)	71	69	54
Hemoglobin test available (%)	26	8	6
Urine dipstick, protein (%)	52	15	15
Iron tablets (single or with folic acid, %)	52	66	38
Tetanus toxoid vaccine (%)	42	60	39

According to reports from SARA and ESPA, nearly all health centers and hospitals offered delivery services in the five assessments during 2008-2018. According to the ESPA 2014, 45% of health posts offered normal delivery services although this is not recommended at the health post unless it has been justified by the availability of skilled personnel and adequate equipment. Table 4-3 shows selected tracer services and items from the different assessments. The use of magnesium sulphate as a first line drug for prevention of convulsions was recommended in guidelines from 2004, but in 2008, almost no facility had magnesium sulphate in stock. Instead, diazepam was used in several of the facilities. In 2016, 72% of hospitals and 45% of health centers had not had magnesium sulphate stockouts in the last three months. Blood transfusion and CS procedures, which both signal functions of comprehensive EmONC, have been available in most hospitals since 2008, showing a gradual increase over time.

Table 4-3: Selected indicators of service delivery readiness for hospitals and health centers in facility assessments during 2008-2018.

	EmONC 2008	EmONC 2016	ESPA 2014	SARA 2016	SARA 2018
Number of facilities					
.. Hospitals	112	316	214	210	303
.. Health centers	685	3488	292	165	164
Offers delivery services (%)	94	100	100	69	76
Uterotonics (parenteral): no stockouts in last 3 months (%)					
.. Hospitals	75	95	88	98	99
.. Health centers	43	70	75	84	93
Magnesium sulphate: no stockout in last 3 months (%)					
.. Hospitals	97	72	69	78	88
.. Health centers	97	45	22	37	69
Neonatal bag and mask, no stockouts in last 3 months (%)					
.. Hospitals		86	98	88	88
.. Health centers	33	72	81	77	68
Emergency transport					
.. Hospitals	86	90	92	99	92
.. Health centers	41	13	91	85	76
Offer CS (%)	78	80	83	86	91
Offers blood transfusion	64	65	78	82	82
BEmONC (fully functioning)					
.. Hospitals	65	59			
.. Health centers	1	5			
CEmONC (fully functioning)					
.. Hospitals	51	45		73	75
Offers safe abortion services (%)	36	42			

Active management of the third stage of labor includes the administration of oxytocin or another uterotonic drug within one minute after birth (in addition to cord traction and uterine massage). Oxytocin was already in use before 2010 and the availability of injectable uterotonics (mostly oxytocin, sometimes ergometrine) was high according to all facility assessments from 2014. The correct use of drugs in the active management of the third stage of labor may be much lower as only 10% of healthcare workers providing delivery or newborn care services reported receiving in-service training in the ESPA 2014.

Neonatal bag and mask availability was close to universal for hospitals and in the range of 70-80% for health centers in health facility assessments from 2014. Their use (performed neonatal resuscitation in previous three months) increased from 40% in 2008 to 73% in 2016. The first neonatal intensive care unit (NICU) initiative started in 2010, in tandem with a newborn corner initiative. By 2015, 49% of NICUs in hospitals were functional and the number of hospitals with NICUs increased from just 30 in 2015 to 196 in 2021 based on the annual performance report

Kangaroo Mother Care (KMC) was the subject of a Ministry of Health funded trial in 2001, followed by implementation three years later. By 2014, there was still low coverage (14%) even though 67% of health centers and hospitals reported Kangaroo Mother Care as a routine component of newborn care, according to the ESPA.

Respondents described how Ethiopia's supply chain systems had been strengthened and suggested this could have contributed to improved maternal and neonatal health. Regarding the availability of pharmaceuticals, the Ethiopian Pharmaceuticals Supply Agency had put in place substantial reforms to limit facility level stock outs since 2011 as part of their Systems for Improved Access to Pharmaceuticals and Services (SIAPS) initiative. On the list of key lifesaving drugs, many are drugs for mothers and children, such as oxytocin and these drugs are replenished in every facility every two months.

Regarding the management of supplies, a participant reported the following: *'...we used to buy and distribute equipment to regions, and regions distribute to zones, zones to districts. This has been creating artificial gaps and huge wastage. Now, health facilities just take directly from EPSA...'*

Nevertheless, respondents pointed to enduring problems with pharmaceutical supplies. A respondent said: *'...Availability of essential drugs is found to be lower through our [Oromia region] assessments. Among 70 health facilities, our assessment found that only 18% of the essential drugs are available. Thus, we should work hard to avail essential drugs at each health facility...'*

In 2008, Basic and Comprehensive Emergency Obstetric and Newborn Care (BEmONC and CEmONC) services were limited to hospitals (65%, including 51% CEmONC) with almost no health center fully functioning at this level. By 2016, health centers with fully functioning BEmONC services had increased to 5%. The proportion of functioning hospitals and health centers had increased from 11% to 40% during 2008-2016, but only 13% of all births occurred in EmONC facilities by 2016. The met need for EmONC was estimated at 18%, mainly because the overall density of such facilities was low.

Except for the ANC with contents indicator, there is little quantitative information on quality of care, even though it was considered one of the contributing factors to the maternal and neonatal mortality reduction, according to our key informants. A key issue is that quality improvements within health facilities increase service uptake, including mothers' willingness to deliver in health facilities. Indeed, in the past, delivery at home was widely perceived as safer than within health facilities. According to a participant:

'...as the data have also indicated, in the past, the number of deaths [of women] who deliver at home was lower than those who deliver at health institutions. This is an issue of service quality. Thus, improved quality of healthcare delivery, for some indicators, is one of the top contributing factors for institutional delivery and thus reduction of maternal and newborn mortality...'

When health workers deliver required care on time and at a high standard, survival improves. In addition to infrastructure improvements and better access to equipment, health worker training was considered a key aspect of improved quality. The following was one informant's experience:

'...In the past, when I was working as physician, I got three months training to [be] able to conduct caesarean section and hysterectomy...when mothers who come to our health facility with urine rupture, we refer them 100kms to hospital. Then they passed away because she will be septic since it takes a while to get healthcare from 100km away...since this was a critical issue...I went on a training to avert this problem. The training was important not because we deliver a very good service as a gynecologist does. But since we deliver on time, our service will be better and brought positive outcome...'

Installation and supply of water and electricity has also been improved across many health facilities, although participants reported that there are still many facilities that use an electric generator or solar energy and non-piped water, especially in rural areas. By improving access to electricity, it was possible to increase positive outcomes in terms of obstetrics and newborn health. It was reported that both water and electric power supplies are important determinants to utilizing MCH services and for provision of safe and high-quality health services.

Electricity for neonatal intensive care units (NICU) has brought about reductions in neonatal mortality. A participant described the implications of improved supply of electricity and water: ‘...Before two or three years [ago] there [was] limited water and electric power supply at health facilities. When these infrastructures [became] available, it was possible to conduct minor surgery at lower health facilities which are close to service users...’

Another informant highlighted the importance of equipping health facilities with basic infrastructure: ‘... it is better to have fifty well-equipped hospitals than 100 hospitals without basic infrastructure... But if the fifty are well-equipped and deliver care at capacity, we can bring the changes we aspire to...to call a health facility a health facility, it must have water and electricity...’

4.9 Availability of essential medicines

The availability of essential medicines is expected within the health sector. Figure 4 5 shows the availability of drugs used during emergencies and signal functions in hospitals and health centers based on EmONC 2008 and 2016 survey data. In health facilities providing BEmONC and CEmONC services, the availability of essential medicines has increased between 2008 and 2016. This includes anticonvulsants (from 54% to 87%), antihypertensive medicines (78% to 92%), oxytocin and prostaglandins (from 84% to 94%). Availability of emergency medicines and injectable antibiotics remained high during the same period. Among the essential medicines assessed, a major increase in availability was observed in anticonvulsants which increased by 61% in the same period.

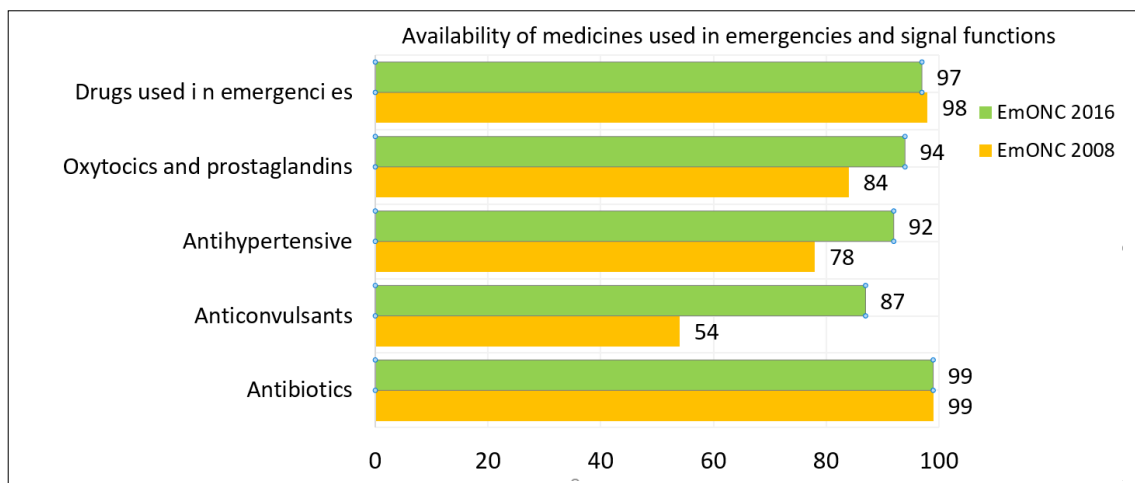


Figure 4-5: Availability of medicines used in emergencies and signal functions, 2008 and 2016

4.10 Health information systems

Data and evidence have played an important role in Ethiopia’s MNH transformation. One strong point has been the reliance on evidence generated in Ethiopia prior to the initiation of a program. The Health Extension Program was initiated after multiple years of work in Tigray to develop the program structure and interventions. Another example is the self-funded trial for Kangaroo Mother Care. In another instance, the Ethiopian government and scientists worked closely with international experts (e.g. FIGO), UN agencies and bilateral partners to develop and monitor programs and projects. The Ministry of Health has strong working relationships with professional societies working on health such as the Ethiopian Public Health Association, the Ethiopian Medical Association, the Ethiopian Midwives Association, and the Ethiopian Society of Gynecologists and Obstetricians. The existence of active professional societies and the academic background of leadership in the Ministry of Health is likely to have facilitated innovation based on data and evidence.

The Health Information System in Ethiopia includes a range of data sources. Ethiopia joined the international household surveys on health relatively late (in 2000) but has maintained regular five yearly surveys since. It has conducted two major EmONC assessments and three health facilities assessments since 2014. This shows the commitment to data, including equity monitoring, although this is not exceptional compared to other countries in the East African region.

Ethiopia has also stressed the importance of action-oriented performance monitoring at local levels, based on a selected set of indicators. Such data would largely be generated by the routine health facility reporting system (also referred to as HMIS). However, the quality of data is often a challenge, as well as the lack of data analysis and use skills at local levels. Progress has therefore been erratic and uneven. Ethiopia only recently adopted the District Health Information Software 2 (DHIS2) - already commonplace in many other countries - and has since started to produce comparable statistics in addition to the periodic surveillance and survey programs for major impact level indicators.

Key informants suggested that in the past, Ethiopia's health information system was weak and there were gaps in collecting and analyzing data on the causes of maternal mortality. However, they felt that improvements were occurring in maternal death surveillance and identifying the cause of maternal deaths. To address the issue, a program called National Maternal Death Surveillance and Response (MDSR) was started in 2013. A participant highlighted that there was poor utilization of data for decision making and to inform routine practice, especially at the lower levels of the health system. However, this was improving. The HMIS, in the past, and now DHIS2, have been strengthened, and data are input into the health system every month. Currently all health centers and hospitals have access to DHIS2 data to foster its utilization locally and for decision making.

4.11 Community-based newborn care programs

Integrated Community Case Management (ICCM) is a strategy aimed at increasing access to effective healthcare services for childhood illnesses (49) by delivering curative interventions to sick children in communities which helps in the reduction of mortality and morbidity. It includes assessment, treatment and referral of newborns with regular and continuous supplies of equipment and consumables (36,49). It was developed by WHO and UNICEF, in collaboration with other development partners, to bring childhood treatment services closer to the home (49,50).

Shifting essential services to the community continued in 2012 with the Ministry of Health's introduction of community-based management of newborn illnesses through the HEP and development of new national guidelines for Community-based Newborn Care (CBNC) within the existing HEP. The national CBNC program focuses on service utilization before and after delivery and the control of infectious diseases.

The CBNC program was launched in two phases, beginning in 2014 by strengthening the linkages between the different PHC units and facilities as well as the scaling up of community-based MNH services. This was then scaled up to safe and clean delivery practices in health centers (21). The annual performance report showed that the number of health centers providing Integrated Management of Neonatal and Childhood Illnesses (IMNCI) services increased from 86% in 2000 to 93% in 2019 while ICCM in health posts increased to 99% and CBNC increased to 94% in 2020. Studies have shown that in the 2013-2017 period, CBNC has improved some maternal and newborn health indicators, particularly ANC service use, safe and clean facility deliveries, antiseptic use for cord care, and amoxicillin and gentamicin injections (50-52). However, curative services may be under-utilized as HEWs reportedly spend only 14-16% of their time providing curative services compared to the estimated 43% time they dedicate to health promotion and prevention (32,36).



INDIVIDUAL AND HOUSEHOLD CONTEXT

Key Points

- Ethiopia's national multi-sectoral policies and strong coordination across multiple development sectors, including poverty reduction, education, nutrition, transportation and water, sanitation and hygiene (WASH), have contributed substantially to the country's health gains.
- Significant maternal and newborn mortality reductions occurred during two decades of strong economic growth, leading to reductions in the proportion of people living below the poverty line from 44% in 2000 to 30% in 2011 and 24% in 2016.
- Government investments in education increased from 2000 and resulted in doubling of the female literacy rate (24% to 48% in 2016) as well as major increases in primary school enrolment (from 24% to 74% for girls in 2016), although there was limited progress in secondary school enrolment (20% by 2019 for both boys and girls). Fertility declined from close to 6 to 4.2 children per woman during the 2000-2019 period contributing significantly to the progress in survival as maternal mortality and neonatal mortality declines can be attributed to the drop in fertility (see the statistics below).
- Fertility declined from about 6 to 4.2 children per woman during 2000-2019 which was a major contributor to the progress in survival: 26% of maternal mortality and 29% of neonatal mortality declines can be attributed to the fertility decline; the median age at first marriage increased from 18.1 to 19.0 years and adolescent fertility decline by about one-third.
- Living conditions improved including an increase in basic access to water from 19% to 41% but access to basic sanitation remained low (7%). Nutritional status improved, shown for instance by a major reduction in women classified as thin (30% in 2000 to 22% in 2016) and a decline of women with short stature (3.6% in 2000 to 2.4% in 2016). The proportion of households with electricity increased from 13% in 2000 to 23% in 2011, and 35% in 2019.
- Female empowerment: There were some improvements according to international indices and survey data, but overall Ethiopia's gender inequality remains high.

5.1 Demographic changes: population growth and fertility

5.1.1 Population growth

With an estimated population of about 115 million in 2020 (53), Ethiopia is the second-most populous country in Africa. Ethiopia's population continues to grow rapidly by an estimated 2 million people annually. In the last two decades, the Government of Ethiopia has been implementing diverse policies and strategies to reduce the population growth rate, shrink the fertility rate and improve reproductive health.

Although there were slight declines in the population growth rates over three decades - from 2.9% in 1994 to 2.6% in 2007 to 2.4% by 2020 - it still is one of the highest growth rates in the world. Following the recent declines in fertility rate, the proportion of the working age population (ages 15-64) increased from 52% in 2007 to about 57% by 2020 while the proportion of children below 15 years has shown a modest decline during the same period from 45% in 2007 to 40% in 2020. The share of working age population is projected to rise to 60% by 2030 and 62% by 2035 (53), further expanding the window of opportunity for a demographic dividend.

5.1.2 Fertility rate

The total fertility rate (TFR) declined from 6.4 children per woman in 1990 to close to 6 in 2000 and 4.1 in 2019 (54,55). The TFR declined by 1.4 children per woman in rural areas but there was no change in urban areas where fertility was about 3 children per woman as early as 2000. While TFR declined both for women with no education and those with primary education, the rate increased for women with secondary education. Similarly, although TFR declined for all wealth quintiles, the smallest decline was observed for poorest women (Figure 5-1).

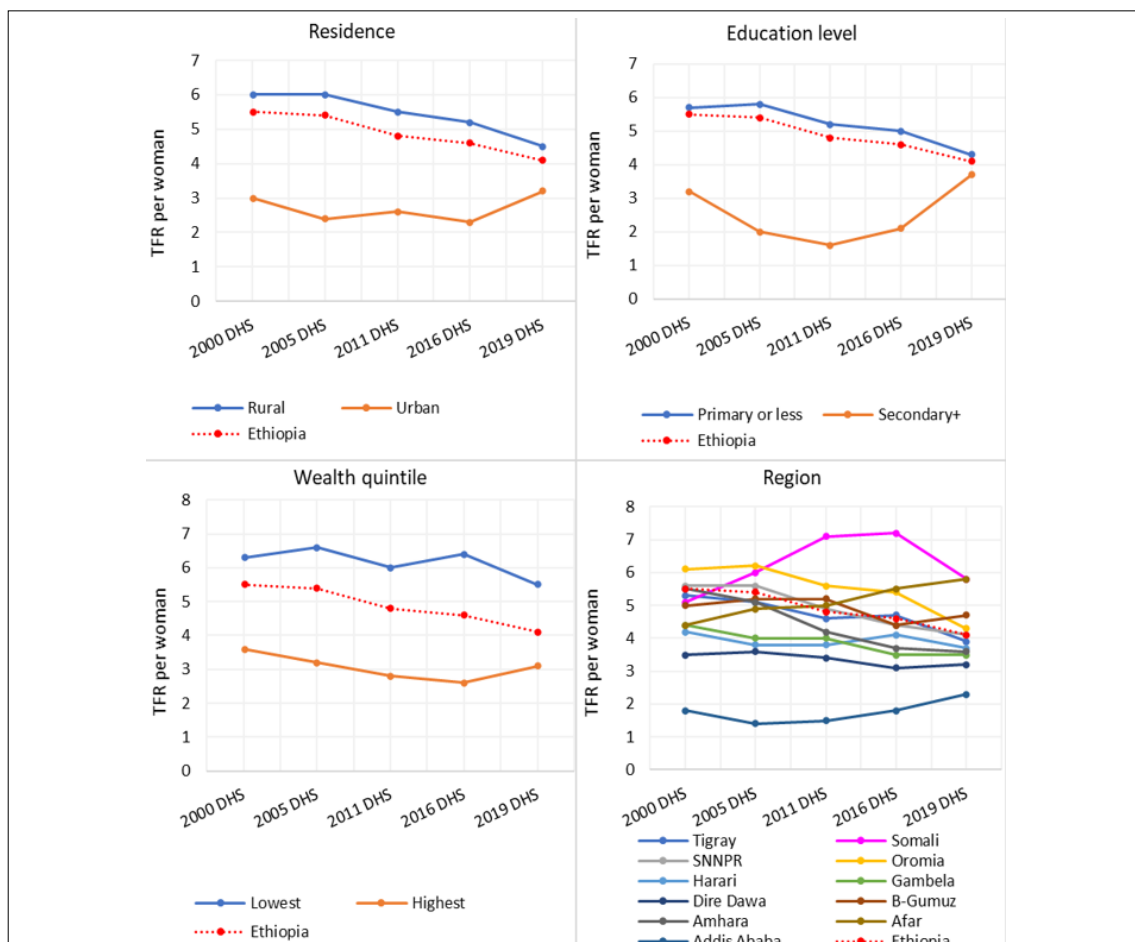


Figure 5-1: Total fertility rate by socioeconomic characteristics and geography, EDHS 2000-2019.

Figure 5-2 presents the average annual rate of reduction in TFR by sociodemographic variables and geography compared with the 2000-2019 national average. The largest reduction in TFR was recorded in Amhara region, where TFR declined from 5.5 to 3.6 children per woman while TFR increased in Somali and Afar (it did not increase in Addis Ababa). The highest TFR according to the most recent survey conducted in 2019, was recorded in Afar and Somali region, which each had about 5.8 children per woman, followed by Benishangul-Gumuz (4.7), Oromia (4.3) and SNNPR (4.1).

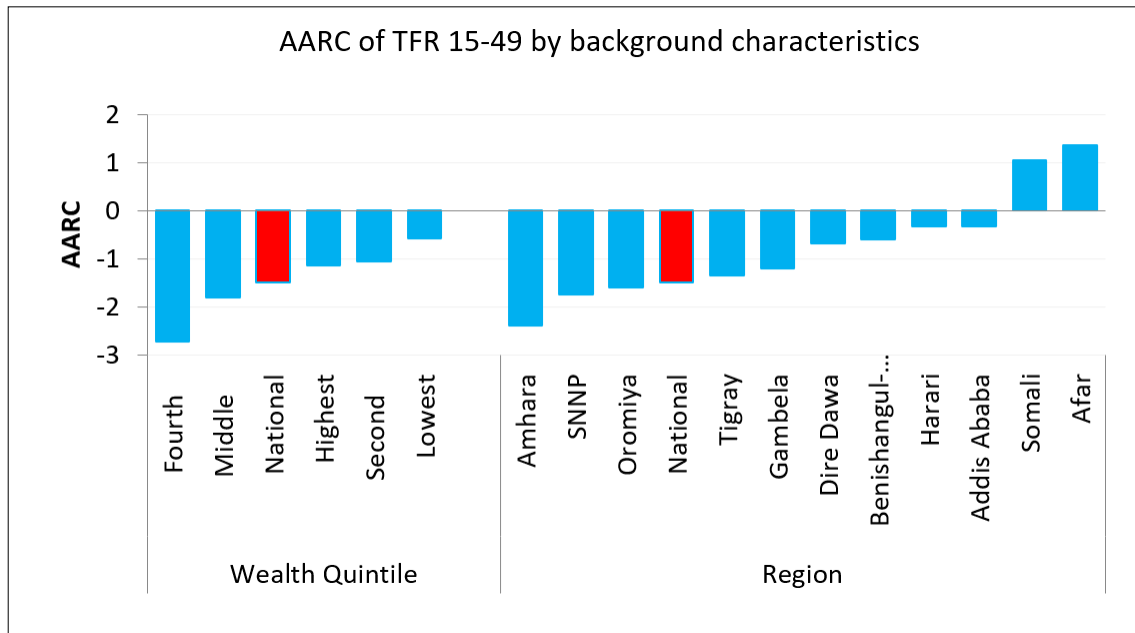


Figure 5-2: Average annual rate of change of total fertility rate for women 15-49 years old by background characteristics, 2000-2019.

The rapid decline of fertility in Ethiopia over the last two decades is attributable to several factors. The fertility decline occurred in all age groups. Studies that examined the determinants of fertility decline using the proximate determinants framework showed that changes in marriage patterns and contraceptive use were the major contributing factors for fertility decline in Ethiopia (56,57). For instance, data from the DHS show that the median age at first marriage rose from 16.4 years in 2000 to 17.5 years in 2016 (54,58). Among women 20-24 years, which reflects recent changes, the median age at first marriage rose from 18.1 to 19 years (see Section 4). The fertility reduction in Ethiopia has been greater than most other countries in Eastern Africa. Only Rwanda experienced a similar decline, while Kenya has had considerably lower fertility rates through the past three decades.

Age-specific fertility rate (ASFR) refers to the three years preceding the survey, computed for each five-year age interval, expressed per 1,000 women. Total fertility rate (TFR) refers to fertility for the three years preceding the survey for 15-49 year old women, expressed per woman. ASFR reduced substantially in all five-year age groups over the past two decades. ASFR among young women, an age group with increased risk of maternal death, also declined over the past two decades from 235 to 195 children per 1,000 women among those ages 20-24 years and 100 to 72 children per 1,000 women for those ages 15-19 years.

Teenage motherhood, referring to adolescents who are mothers, has declined from 13% in 2000 to 10% in 2019 (Figure 5-3). Childbearing - which is the sum of proportion of teenage pregnancies and motherhood - has shown little change over the past decades. The overall proportion of adolescent childbearing in Ethiopia over two decades has declined from a little over 16% in 2000 to 13% in 2019.

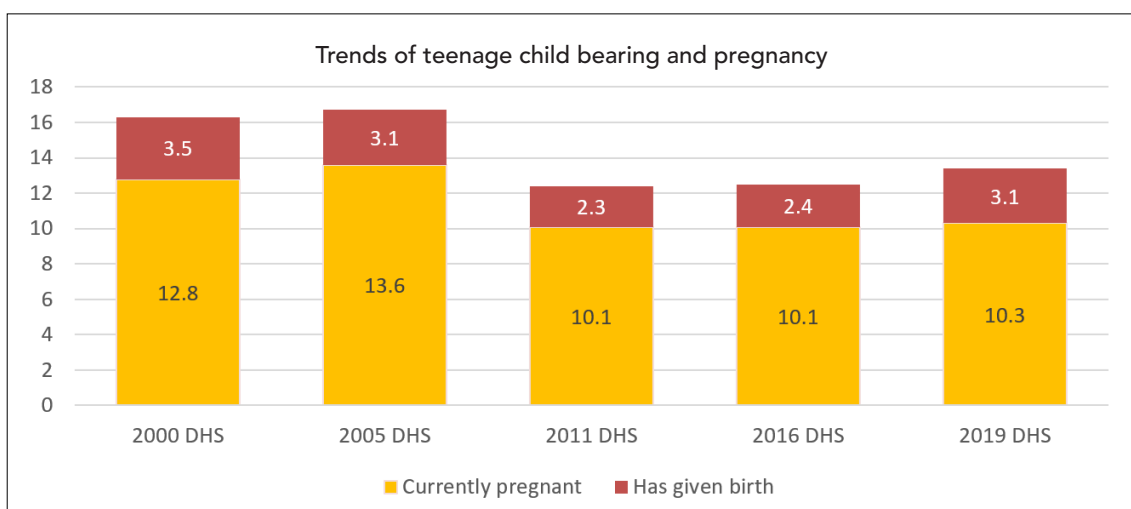


Figure 5-3: Teenage childbearing and pregnancy (15-19 years), 2000-2019

Ethiopia experienced declines in maternal mortality and fertility during the last two decades. An examination of the role that fertility decline plays in maternal mortality reductions is crucial to initiatives such as family planning programs that contribute to fertility reduction. A method utilized elsewhere is used to decompose the overall decline in MMR observed between 2000-2017 and in NMR observed between 2000-2019 (11). We quantified the decline attributable to fertility and safe motherhood programs.

The decline in fertility was assessed both in terms of decline in crude birth rates and changes in age-parity birth risk composition - a proxy measure used to estimate the effect of safe motherhood programs. Crude birth estimates from the United Nations, MMR from UN-MMEIG and NMR from UN-IGME were utilized to estimate the impacts of fertility. The fertility decline has an important impact on both the numbers of deaths and the risk of death. We focused on the latter measure, where fertility may affect the mortality risk through relative reductions in the proportion of births to very young or older women, and high parity births that generally have higher mortality.

5.2.1 Impact of fertility declines on maternal mortality ratio

The population growth rate in Ethiopia declined from 2.9% in 2000 to 2.5% in 2017, while the crude birth rate declined from 43.7 in 2000 to 32.8 births per 1,000 people representing an average annual reduction rate of 1.6%. In the same period, MMR reduced from 1,010 in 2000 to 401 per 100,000 live births, declining by 61% at an average rate of 5.5% annually, which cut the total number of deaths by more than half (30,000 deaths in 2000 to 14,000 deaths in 2017). A decomposition analysis, using Jain's approach, showed that the declining fertility has contributed to a 26% decline in maternal mortality rates between 2000-2017 (Figure 5-4).

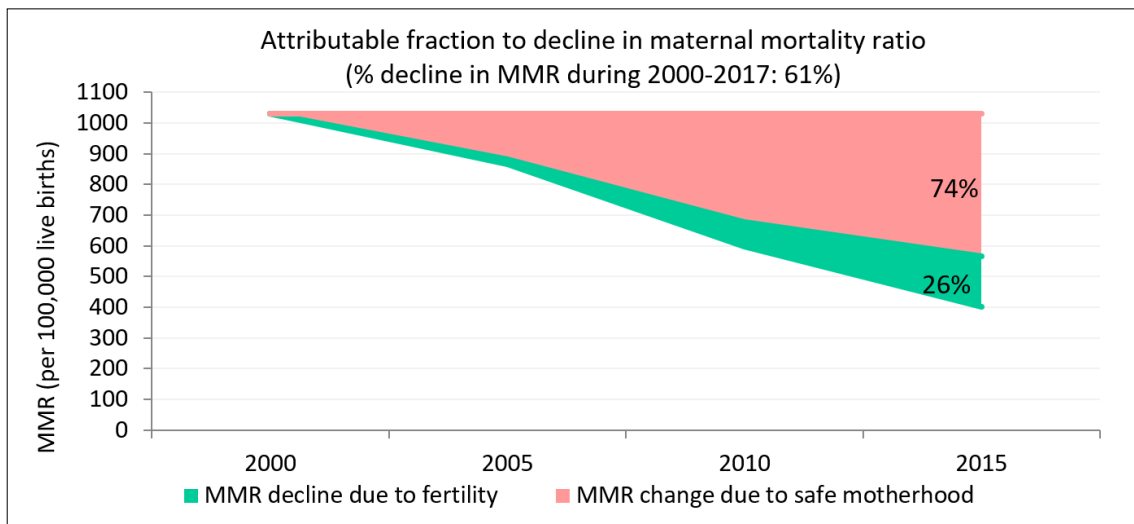


Figure 5-4: Percent contribution of fertility decline to overall decline in MMR, 2000-2017

The neonatal mortality rate in Ethiopia has reduced from 48.6 in 2000 to 27.8 per 1,000 live births in 2019, according to UN-IGME estimates, which corresponds to a 43% decline in NMR during the period between 2000-2019. Figure 5-5 depicts the percentage contribution of declining fertility to overall decline in NMR. Results show that the fertility decline in Ethiopia had a role in reducing NMR, contributing 29% of the decline in NMR observed between 2000-2019.

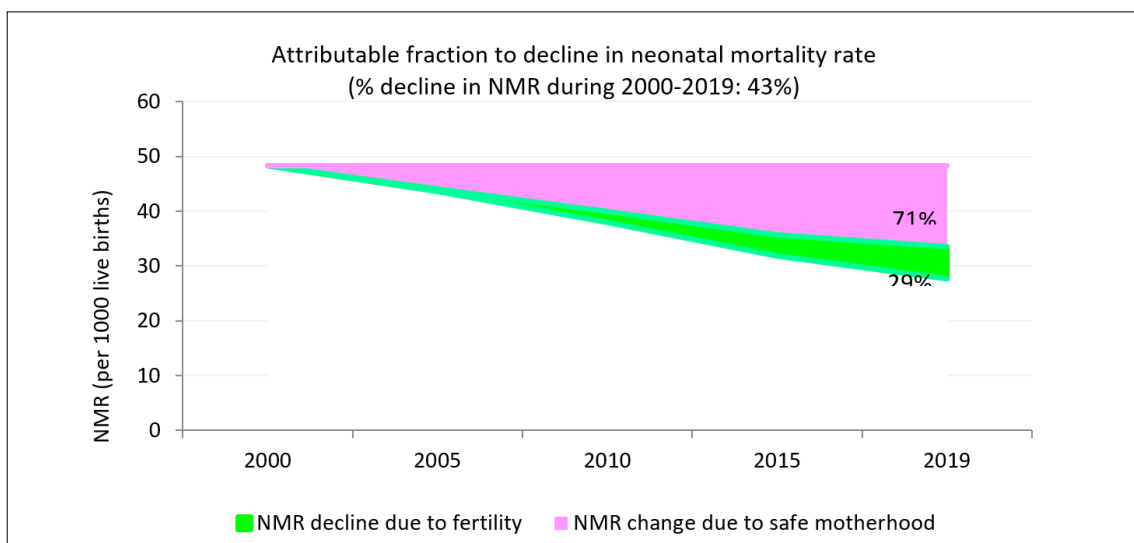


Figure 5-5: Percent contribution of fertility decline to overall decline in NMR, 2000-2019

5.3 Economic changes

Economic growth and poverty reduction strategies in Ethiopia were described by respondents as having made important contributions to the country's maternal and neonatal mortality reductions. One said: '*...Ethiopia's pro-poor sustainable and poverty reduction strategy is very critical. Many things [have been] achieved because of it. In Ethiopia, equity should be as the HSTP; we should favor the poor. And most of the policies are favoring the poor and that is an important thing...*'

These strategies led to improvements in Ethiopia’s economy, which in turn led to health improvements, as one respondent reflected: ‘...As the country’s GDP increases, the budget allocated for the health sector increases and our expenditure increases as well. We will directly be benefited from this...’

Economic development also had positive implications for populations, such as by enabling them to access education, have better access to food and transport, and better housing, water and sanitation services, which in turn have clear benefits for improved maternal and neonatal health. A respondent explained:

‘...Through macroeconomic growth we can expect household level economic growth. Every little [increase in] national economic growth has a positive effect on the household and on maternal and neonatal health...’

Ethiopia experienced rapid social and economic changes in the last two decades. It had one of the fastest growing economies in the region although it is still one of the poorest countries. According to data from the World Bank, Ethiopia’s economy experienced strong annual growth rates from 2000, i.e., 6.2% in 2000-2005, peaking at 10.3% in 2005-2010, dropping slightly to 9.7% in 2010-2015 and 7.7% in 2015-2020 (59). The health expenditure trends are shown in Chapter 6.

The economic growth experienced in the last decade brought with it positive trends in poverty reduction in both urban and rural areas. Data from the World Bank’s poverty monitoring surveys show that the share of the population living below the national poverty line decreased from 44% in 2000, to 30% in 2011 and 24% in 2016 (60). These declines occurred across all regions. However, the rate of poverty reduction was slower in rural areas where nearly 80% of the population lives.

5.4 Education

During the last two decades, Ethiopia also made tremendous progress in the education sector, especially in expanding access to primary education. Literacy rates for adult women improved over the past two decades, rising from 24% in 2000 to 48% in 2019. Between 2000 and 2019, net enrolment for girls (defined as the percentage of primary school age girls attending primary school) rose from 29% in 2000 to 44% in 2005 and 72% in 2016. After that, growth showed little increase (Figure 5-6). The primary school completion rate increased to 58% by 2018 while the gender parity index for primary completion reached parity. However, enrolment at secondary school level remains low despite modest improvements over the last two decades. By 2019, net enrolment of girls in secondary school was only 20% while net enrolment for boys was similarly low at 20%.

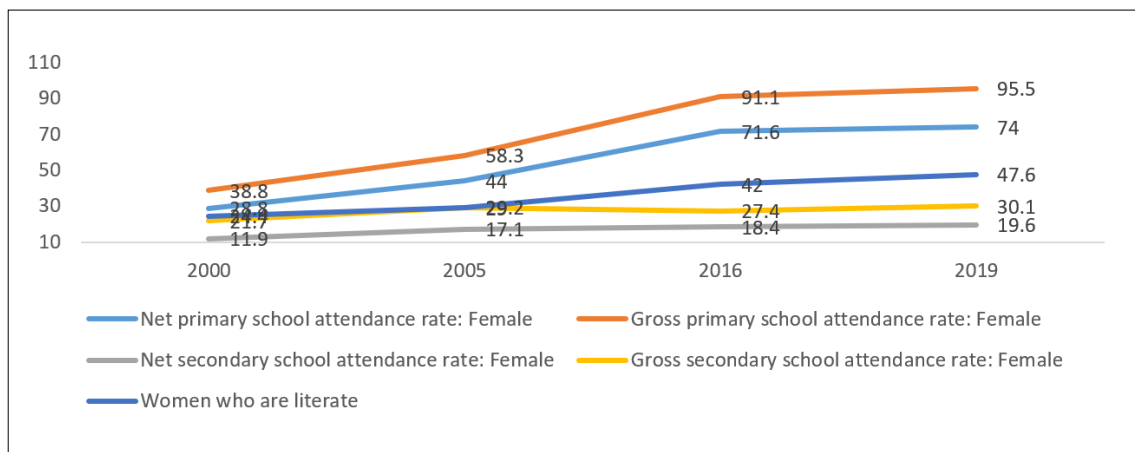


Figure 5-6: Trends in girls’ school enrolment in Ethiopia, 2000-2019 (Source: DHS (CSA & ICF, 2001, 2006, 2017 and 2020).

There was also a major decline in the proportion of out-of-school female adolescents, ages 15-19 years from rural areas and poorest households over the past two decades. The proportion of out-of-school female adolescents at age 15 dropped overall from 74% in 2000 to 25% in 2019, while it dropped from 81% in 2000 to 26% in 2019 among those from poorest households (Figure 5-7).

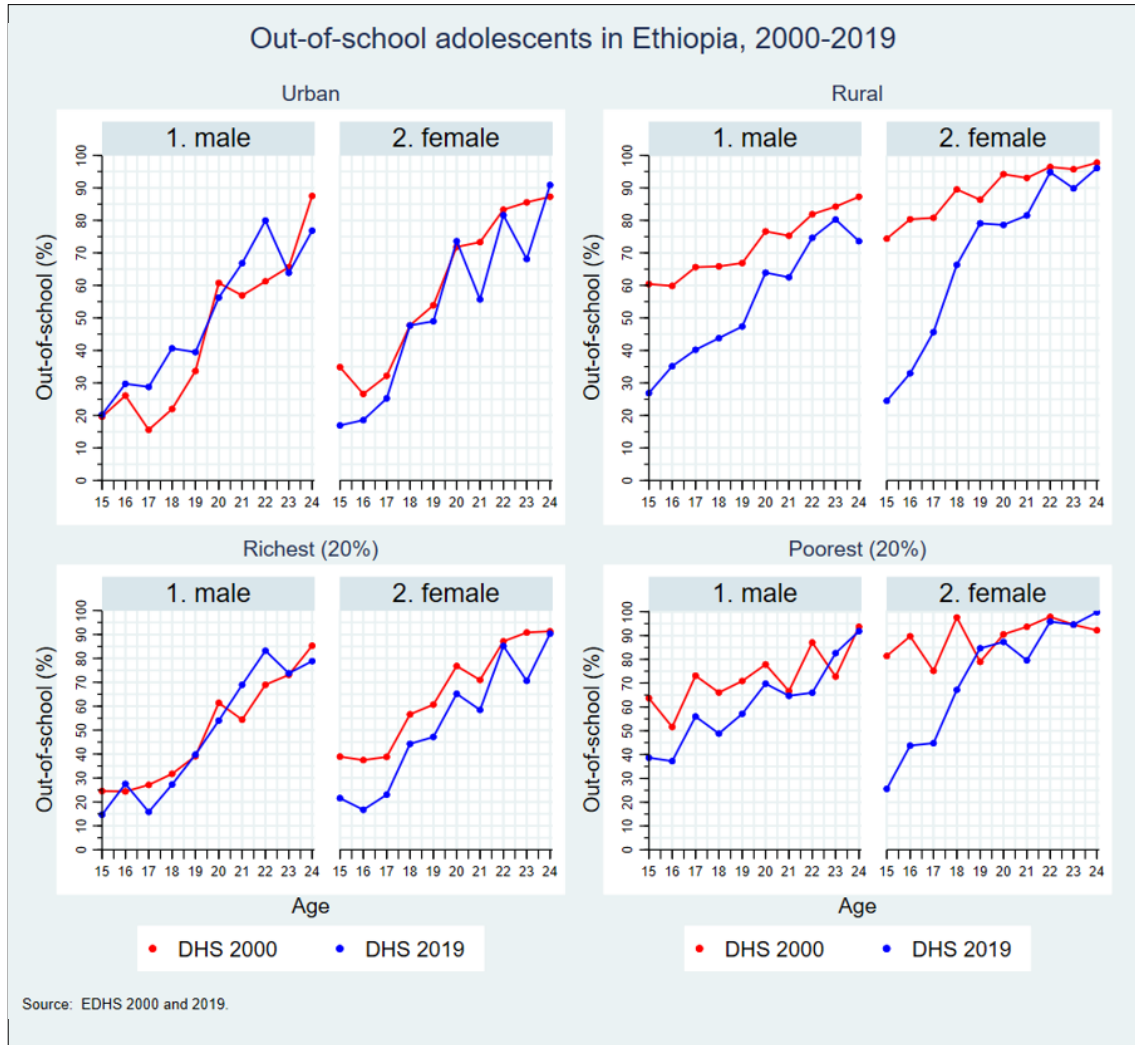


Figure 5-7: Proportion of out-of-school adolescents at age 15 years, 2000-2019

Between 2000 and 2019, the literacy rate for adult women of reproductive age improved, doubling from 24% to about 48%. However, Ethiopia’s adult literacy rate is still one of the lowest in the world. In addition to low adult literacy, marked disparities in education persist between rural and urban areas, among different regions, and across wealth quintiles. Other major challenges to the education system include school dropout rates, the quality of education and poor access to schools in lowland pastoral nomadic areas (Ministry of Education, 2015).

Incidentally, the Government of Ethiopia spends the largest share of its overall expenditure on education. While the education expenditure as a share of its GDP fluctuates between 4% and 6% of its GDP (61), education expenditure as a share of overall government expenditure increased markedly after the 1990’s, peaking at 30.5% in 2012. The sector still receives about 20% of government expenditure (62).

The links between education, particularly *girls' education*, and health in Ethiopia are also widely reported in the literature (8). Our respondents confirmed that this had been a key development in Ethiopia with one of them saying:

'...Improvement on education is equally important as investing on health ... currently primary education has reached one hundred percent coverage, and this has value. Girls' education ... the proportion of girls who advanced in school, these all is very important...'

Respondents pointed to several of the interrelated effects of improved girls' education on maternal and newborn mortality, including: improved health literacy and health-seeking behavior (especially facility deliveries and family planning services); demand for better services; receiving better quality of care; and the discontinuation of harmful 'traditional' practices surrounding childbirth. Girls' education is also closely linked to women's empowerment, which was another significant factor influencing improved maternal and newborn mortality in Ethiopia.

An important factor, closely linked to wealth, was the difference in *education levels* that existed between regions and between urban and rural communities. A respondent noted: *'...there is a huge gap not only in geography but wealth and education. The disparity is also the same when we [compare] ... urban and rural settings...'* Geographical differences in levels of education, particularly girls' education, were seen by respondents as closely linked to regional differences in health-related practices, health literacy, patterns of health service uptake including family planning services, and demands for more and better healthcare. A respondent remarked:

'...girls' education significantly contributed [to] maternal and neonatal health'. Another respondent explained: 'Regarding sociocultural factors, education is the [main] one. Where there is education, health seeking behavior would increase and ... demand for healthcare services...'

Lower levels of girls' education were seen as a particularly important and ongoing problem in some of the 'emerging regions'. For example, one respondent said: *'...Since there is no access [to] education or transport, these regions lag behind. Especially Somali region is lagging with regard to sexual and reproductive health, including family planning. This has to do with the lack of education compared to other regions...'*

Respondents talked about improvements in girls' education in Ethiopia as having led to better levels of *health literacy*, which encourages healthcare utilization and better health-related practices within households. For example, a respondent said: *'...Previously, giving birth at the health center was not the norm. Traditional birth attendants and some mothers ... used to think going to health facilities as a curse...these things are solved with health literacy ...related to education...'*

Another respondent described how education could lead to better health literacy:

'...Because of the education expansion, there are many literate children in rural families, and they assist their families through reading leaflets and explaining our health education messages. The presence of many educated children per family [has] assisted families' behavioral change...'

The HDA and WDA were also seen as key interventions that had substantial impacts on health literacy: *'...there was a one-to-five network...the Health Development Army, ...to improve health literacy...they discuss health issues while drinking coffee. So that has increased their health literacy...'*

Better education and health literacy were linked to improved healthcare seeking behavior, as a respondent captured: *'...if your education level increases your awareness also increases. Specifically, where there's education there's high utilization of health services'. Education and health literacy improvements were closely related to increases in women seeking health facility deliveries and using family planning services. A respondent explained why facility deliveries had increased in Ethiopia:*

'...demand among the community is increasing over the years.... The increase in literacy levels has contributed to the health seeking behavior [changes] ...I believe this is a product of multi-sectoral collaboration... before ten or so years, institutional births...were only five percent, now it's fifty percent...this result is not brought about forcefully. This is because mothers wanted to give birth at facilities...'

Girls' education had other effects on maternal and newborn health. One was girls' education being associated with empowering women to demand more and better health services, because they had a better understanding of what they needed and were more likely to be listened to. A respondent explained:

'If you know something, you ask what is important for you... it created "Teyaqi mahibereseb"; the questioning society. People started to ask ... "we need this type of service". Hence, better educated women tended to receive higher quality healthcare, including better attention from healthcare providers:

'...we see educated mothers and uneducated do not receive equal service...' observed a respondent. Additionally, educated women were more likely to be in the labor market, which gave them more power and autonomy in their decision making, including, for example, whether to elect to give birth in a health facility or to use family planning services. One respondent captured this issue:

'...Women's policies have also increased the awareness of women about the right of gender-centered services... and they have contributed to mortality reductions ... when women own business and have sufficient income, they will have choices for promoting their health...'

Additionally, while the continuation of 'traditional' harmful practices remained commonplace in some Ethiopian regions, girl's education was seen as a major factor leading to reductions in these practices. A respondent explained:

'... Some harmful traditional practices used to cause maternal death. These days, through education and discussion with both mothers and the community, almost all are removed... there has been a practice of cutting tonsils of the newborn...currently, there are no serious sociocultural factors which could be a cause for maternal and neonatal health...'

Mothers were also reported as being more aware of basic hygiene practices in the home, having a better understanding of nutrition and as being better able to recognize and deal with the onset of childhood illnesses. One respondent noted: *'...the role of the program is ... to teach mothers how to treat their children, what should their children get, what things brings harm to their children, how hygiene brings disease to their children, and to drink pure water...'*

According to our respondents, religious and traditional beliefs and practices also had important implications for healthcare seeking and consequently on patterns of maternal and newborn mortality between and within regions. For example, it remained commonplace for some communities to resist adopting certain health services, including a preference for home deliveries. A respondent described the strong preference for home deliveries that remained in some parts of Ethiopia:

'...culture has adverse effects... For example, in [one particular] religion which I know very well, a mother who gives birth is only [allowed] outside of her home after a sprinkle of holy water. This is at the fortieth or eightieth day depending on the sex of the newborn. So, both religion and culture have significant impact...'

A related problem that was common in some regions was the lack of acceptance of family planning services. A respondent highlighted: *'...Culture has also its own impact. For example, there are communities which do not allow utilization of family planning. They still resist and do not understand you. There is a cultural influence on the health seeking behavior...'*

5.5 Female empowerment

A full assessment of changes in female empowerment is beyond the scope of this report. There were however a number of changes that were indicative of trends towards greater female empowerment, although overall levels were still low:

- Increase in age at first marriage: The decrease in the percentage of women 15-24 years who were married by age 20 from 65% in EDHS 2000 to 58% in EDHS 2016.
- Increase in enrolment of girls in primary schools: This rose from 29% to 74% during the 2000-2016 period and in secondary schools from 12% to 20%, as well as an increase in female literacy from 24% to 48%.
- Gender inequalities reduced in Ethiopia, as measured by the UNDP gender inequality index: This reflects trends in reproductive health, empowerment and the labor market where inequality declined from 0.622 in 2005 to 0.517 in 2019 (zero means no inequality) (63). This puts Ethiopia below the global averages (0.493 and 0.436 in 2005 and 2019), but the progress and performance was better than sub-Saharan Africa's overall (from 0.619 to 0.570) during the same period.
- According to the gender gap index of the World Economic Forum, which benchmarks progress across four dimensions (economic opportunities, education, health and political leadership), Ethiopia ranked 97th among 156 countries and dropped 15 places between 2006 and 2020. It scored highly on political leadership, but had low scores on economic opportunities and education while health scores were intermediate (64).
- The female empowerment measure obtained from the DHS is called SWPER. It includes attitudes to violence, social independence and decision making. Ethiopia ranked low compared to most other countries in sub-Saharan Africa, based on the EDHS 2011 (65).

5.6 Improvements in nutrition and living conditions

The EDHS results documented major progress in several anthropometric indicators. The percentage of women with short stature (< 145 cm) was 3.6% in 2000, decreasing to 2.4% by 2016. Fewer women were thin (BMI < 18.5), declining from 30.1% in 2000, to 26.9% in 2011 and 22.4% in 2016. Data on birthweight trends were not available.

Respondents agreed that improved agricultural production and food supply which resulted in *better nutrition*, had contributed to reductions in maternal and newborn mortality. *'...As we invest in agriculture, in terms of production, in terms of food, you are certain to influence health..'*, one respondent said.

Our respondents highlighted key links between nutrition and maternal and neonatal mortality (issues that are not mentioned elsewhere (8)). One said:

'...nutrition is one contributing factor...when an adolescent woman is malnourished, there could be death during delivery or neonatal death. There would also be an underweight newborn baby. Being underweight is a risk factor for neonatal mortality. Nutrition focused activities are essential not only for adolescent woman but also all women. It is vital not only during pregnancy but also during the life course of mothers for positive birth outcomes...'

Another respondent added:

'... the underlying cause for under-five mortality is nutrition, for about fifty to sixty percent. Diseases such as measles and pneumonia are not killers by themselves, but when immunity is weak, they kill. Thus, it is not only prescribing antibiotics, but prevention by [better] nutrition is very important...'

It was reported that the government's agricultural transformation efforts had led to improved nutritional status. Agricultural mechanization improved people's self-sufficiency while agricultural specialization programs improved households' access to more diverse food supplies.

Other respondents described improvements in Ethiopia's agricultural production, irrigation, and broader food supply systems including food pricing and purchasing power, which in turn reflected and contributed to economic development in rural areas and impacted positively on maternal and newborn health. Overall, food security was seen to be improving as one respondent said:

'...During my childhood, I've seen many people food insecure, they spend a night without eating. Previously there is a gap between farmers. But now most people are similar. Everybody eats. Previously we have seen child malnutrition everywhere...'

Our respondents described the links between food security and economic development. One said: *'...agricultural development also contributed [to] health promotion or death reduction. In addition to getting food, it also contributed to economic growth. So, agriculture has its own contribution...'*

Another respondent added: *'...The main contributing factor was not direct healthcare provision, rather nutrition...nutrition related changes which refer not only the nutrients but also the food system...that also includes increase in agricultural products, increased human purchasing ability, increased availability of food item supplies...'*

5.7 Improvements in water, sanitation and hygiene (WaSH)

According to the WHO/UNICEF estimates based on surveys and other data, Ethiopia made considerable progress in improving basic access to safe water from 13% in 2000 to 37% of the overall population in 2020. Major reductions occurred in the use of surface water and unimproved sources. Urban populations have much better access to safe water (80% in 2020, up from 77% in 2000) than rural populations (31% in 2020 up from 9% in 2000). Access to basic sanitary facilities also progressed, mainly through a major reduction in open defecation practices (from 77% to 17% during 2000-2020). The coverage of safely managed or basic sanitation increased from 3% to 9% of the population.

According to our respondents, *improvements in WaSH* - the supply of clean water, better sanitation and improved hygiene - had contributed substantially to infection prevention and hence, to maternal and newborn health gains in Ethiopia.

'...You cannot maintain your health where there is no hygiene and sanitation. This has a great contribution!...'

These changes were described as applying within households and communities, as a respondent said: *'...when clean water is available in the community ... mothers will be healthy...'*

Significant improvements were also reported within many rural health facilities in terms of the supply of clean running water and toilets and broader hygiene-related practices. A respondent noted: *'...access to water in health facilities has also contributed to maternal and neonatal death reduction...'*

These findings confirm what has already been reported elsewhere (8).

The proportion of households with electricity increased from 13% in DHS 2000 and 14% in EDHS 2005, to 23% in 2011, 26% in 2016 and 35% in 2019. In rural areas, only 14% of households had electricity by 2019.

5.8 Urbanization

Ethiopia is among the least urbanized countries in sub-Saharan Africa. However, the country is rapidly urbanizing. The 2020 urbanization level of 21% (66) is an increase from 13% in 1990 but it is lower than the overall average in sub-Saharan Africa. However, urbanization in Ethiopia has been growing at a rate of 4.5% in the last decade, faster than the 4% average rate in Sub-Saharan Africa (67). Data from Ethiopian censuses show that the level of urbanization increased from 11.4% in 1984, to 13.7% in 1994 and further to 17% in 2007 (55,68,69).

Projections from the World Bank show that with the current rate of growth, the level of urbanization is expected to reach 40% by 2037 with nearly 50 million urban residents (Figure 5.8).

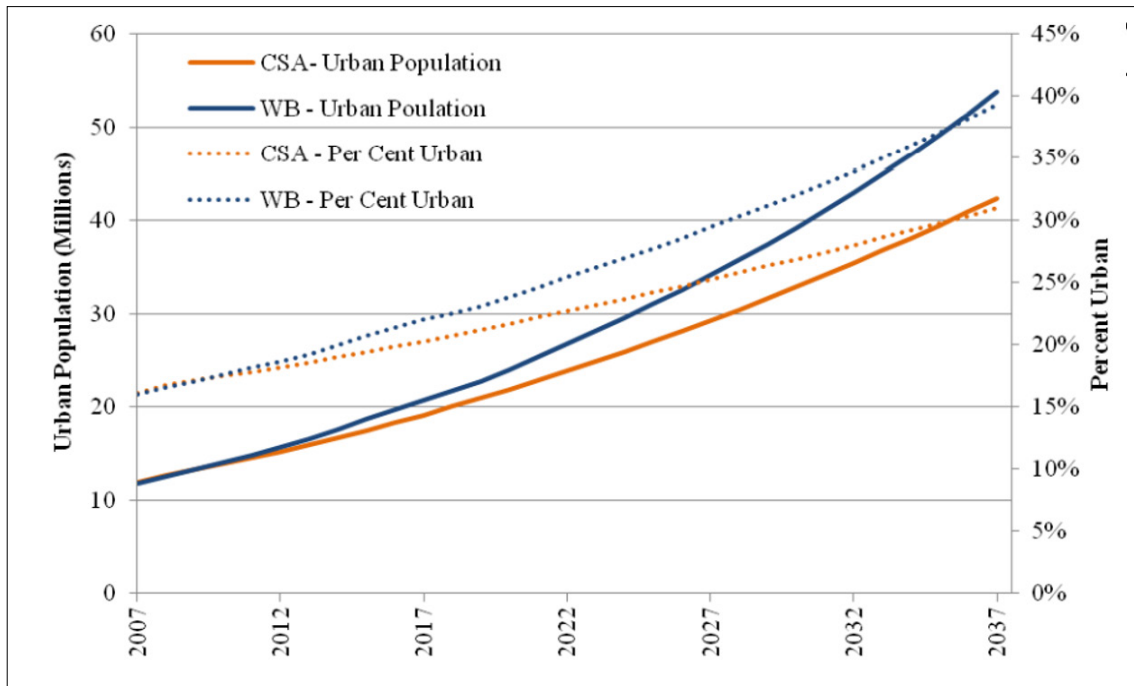


Figure 5-8: Comparison of Urbanization Projections for Ethiopia (source: World Bank, Ethiopia urbanization review, 2015)

The rapid urbanization in Ethiopia is largely caused by rural-urban population influx patterns. This has created various challenges including the proliferation of slums, informal settlements, inadequate housing, homelessness and unemployment in the urban areas (70). There is limited data on maternal and newborn survival inequalities within urban areas. Differences between rural and urban populations were also reported by respondents as important in explaining maternal and newborn mortality patterns. A respondent summarized:

'...There is a big gap between rich and poor...there is huge gap between people from rural places and urban...'

Obvious issues included the better geographical access to health and other services experienced by urban communities, and conversely, problems of access in more remote rural areas, as a respondent captured:

'...Improved healthcare deliveries are found [in] towns. So inaccessible areas in rural areas or places which are very far from towns have limited access to health facilities... [there] might still be a delay while the ambulance brings the women to the health facility...'

Urban communities were described as more likely to move away from 'traditional' practices and beliefs since they have better access to information, including through mass media and mobile technology. A respondent reflected on these factors:

'...an urban woman has access to radio, television, newspapers, and so on. They have mobile phone, and they access everything through their mobile. So, they can easily get the information and be aware about their health needs. But rural mothers don't have access to media...'

Finally, our respondents emphasized the maternal and neonatal mortality differences between agrarian and pastoralist populations. In particular, they reported substantial problems with improving health services that would help to reduce maternal and newborn mortality among pastoralist populations concentrated primarily in the 'emerging regions'.

Agrarian populations, on the other hand, lived mostly in the 'developed regions', and it was in these regions that the most rapid improvements in health services were concentrated. As one respondent noted:

'...Luckily, those big regions are agrarians and better in health literacy, political commitment... both human and financial resources and infrastructure. I believe, that facilitated the implementation process what we cascaded from here...'

In fact, the Health Extension Program had concentrated on expanding healthcare delivery in those regions to those populations, although later efforts were made to improve service coverage among pastoralist communities, as a respondent noted:

'...most success initially was seen in rural areas because those people were reachable and most of the Health Extension Program was implemented in agrarian and rural areas rather than, for example, pastoralists. But the pastoralist Health Extension Program later on was also revised...so that helped then a lot in terms of mobile communities...'



POLICY LEVERS

Key messages

- Political commitment and national leadership for maternal and newborn health, led by the Ministry of Health.
- A well-organized system of health strategies, policies and plans since the late nineties, with quality plans, progress reviews, some accountability, and the prioritization of maternal and child health.
- Aligning the development partners' strategies with the national framework has been a central element.
- Components of newborn health were explicit in plans from 2005, but were prioritized from 2010.
- National leadership's commitment to maternal and newborn mortality reduction.
- Total health expenditure per capita increased seven-fold from 1995 to 2017, predominantly driven by out-of-pocket spending and government resources in the initial years and external resources throughout.
- Total health expenditure as a percentage of Gross Domestic Product (GDP) increased from 3.8% in 1995 to 5.2% in 2010 but then decreased to 4.2% in 2017.
- MNH received its highest levels of external funding from 2012 onward.
- The burden of health expenditure at household level increased over time. Households that spent more than 10% of their income on healthcare doubled from 1995 to 2017, more so in the urban areas than rural areas.
- Community-based health insurance functioned as a financial protection mechanism and as an instrument for addressing equity as 80 % of Woredas were involved and 28% of households enrolled in the community-based health insurance scheme.

Key informants pointed out that strong national political leadership had been crucial to achieving better health outcomes. Once a leader is committed to achieving a particular result, desired outcomes tend to be achieved. For example, a participant emphasized the decisive role of political will:

'...politics determines everything such as health programs and plans direction, prioritizing maternal and newborn health, resource allocation and others...'

In the past two decades healthcare and MNH in particular, was a serious political priority. One respondent summarized:

'...Let's first start with...political commitment by government...since 2003, government started to focus ... on actioning, the MDGs and later the SDGs. That really drives [the] process. And ownership - the health policy of 1993 clearly specifies the focus on primary healthcare. So, the entire focus of the first twelve years... [was the] expansion of primary healthcare...'

Another respondent added: *'...government has taken maternal health and emergency cases as priorities ... other countries should take such lessons from Ethiopia...'* These perspectives echo those made previously (8,71).

6.1 Policy timeline for key events, policies, strategies and programs

In the health sector, the Health Sector Development Plans (HSDP) and later, the Health Sector Transformation Plan (HSTP) document the overall goals and priorities of the health sector. Between the years 2000 and 2020, various RMNCH plus Nutrition-related policies, strategies, programs and interventions were formulated and implemented to reach the goals set out in the HSDP/HSTP. A policy timeline was developed to show the changes in a chronological order, from the policy formulations to initiation of the programs.

As shown in Figure 6-1 below, the genealogy of health policies in Ethiopia stretches back beyond the year 2000 to the establishment of a new government in 1993. This was a key event that changed the whole governance system, and the health system in particular. The establishment of five-year health program cycles within the Health Sector Development Plan (HSDP) from 1998-2015 laid the foundation and was followed up by the transition to the Health Sector Transformation Plan (HSTP) from 2015. At the time of writing of this report, the second (HSTP-II) is in its second year of implementation.

As shown in the timeline (Figure 6-1), except for the Integrated Management of Childhood Illness (IMCI, now IMNCl with the inclusion of newborns) policy, which was formulated in 1997, most of the policies and programs that targeted reproductive, maternal, newborn and child health were formulated and launched between 2003 and 2007. One of the notable inputs during this period was the initiation of HEP, which accelerated the expansion of health services to rural communities and changed the focus from mass campaigns and facility-based services to routine service delivery at community level.

Reproductive health became increasingly important from 2006 through the development of the National Reproductive Health Strategy (2006-2015). Clean and safe deliveries as well as newborn health were prioritized from 2008 onwards. This was further strengthened by the community-based newborn care (CBNC) initiative introduced in 2013. Nutrition received more attention from 2006 and continued to be strengthened through community management of acute malnutrition, a program introduced in 2010.

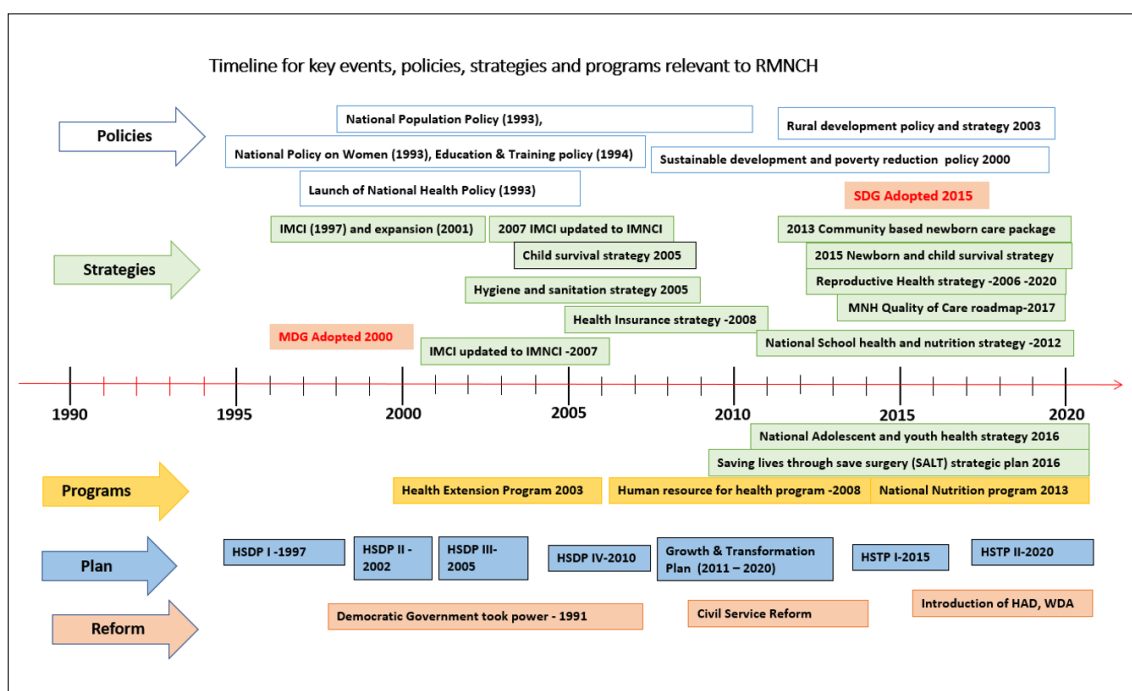


Figure 6-1 : Timeline for key events, policies, strategies and programs relevant to RMNCH, 1990-2020

6.2 Major policies, strategies and programs

Health Policy 1993

The Ethiopian Health Policy dates back to before 1974 and focused on curative health services (72). This changed with the formulation of the current National Health Policy in 1993. The policy prioritizes democratization and decentralization of the healthcare system; development of the preventive, promotive and curative components of healthcare; assurance of accessibility of healthcare for all segments of the population; and the promotion and enhancement of national self-reliance in health development by mobilizing and efficiently utilizing internal and external resources. The policy underlined that healthcare services must primarily focus on promotive and preventive healthcare services. The health policy also outlines the priority health issues to be addressed.

Following the approval of the National Health Policy, a 20-year Health Sector Development Plan was formulated and implemented in a series of 5-year programs. Ethiopia's health programs were developed to align with the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). In addition to these global frameworks, Ethiopia's health policies are also aligned with other national policy infrastructure components, such as poverty reduction programs, rural development strategies and the Growth and Transformation Plan (GTP).

Having a single, consistent health policy implemented through twenty year strategies (HSDP/HSTP) is a key strength of the policy environment (9). Literature suggests that there are three ways (aid, ownership and coordination) in which the HSDP has enabled the Ministry of Health to strengthen donor coordination and improve Ethiopia's health outcomes (9). Central to Ethiopia's successes is the fact that the HSDP is locally grounded as it was developed by the Ministry of Health in response to self-defined national health policies. Having clear statements on national health priorities and goals also ensures that donors are aware of, and can align with the national plan.

HSDP-I (1997/1998 - 2002/2003):

- Principal focal areas were increasing access and coverage to healthcare services and improving service quality through intensive training as well as an improved supply of necessary inputs.
- Strengthening healthcare services at facilities and outreach sites through campaigns.
- Routine RMNCH services such as family planning, tetanus toxoid vaccinations, ANC, safe delivery, PNC, expanded program on immunization, Vitamin A supplementation and growth monitoring and promotion were provided at facilities and outreach sites during HSDP-I.
- Strengthening and expanding the Integrated Management of Childhood Illness (IMCI) program, initiated in 1997 (36), was planned and implemented during HSDP-I.

HSDP-II (2002/2003 - 2005/2006):

- Expansion of healthcare service delivery through the initiation and implementation of the HEP in 2004.
- The HEP prioritized the promotion of optimal health as well as prevention and control of diseases through active community involvement and participation. Two female Health Extension Workers (HEWs) were deployed in each Kebele and stationed at the health post to provide HEP services to an average of 5,000 people.

HSDP-III (2005/2006 - 2010/2011):

- The main focus of HSDP-III was to speed up progress towards attainment of the MDGs and so emphasis was placed on scaling up interventions that were lagging behind the targets.
- More emphasis was given to strengthening delivery services at health posts and all health facilities by expanding safe and clean delivery services, basic emergency obstetric care as well as comprehensive emergency obstetric care.
- Newborn health began to receive attention during HSDP-III. In 2007, newborn resuscitation equipment was introduced at facility and community level following the initiation of community-based IMNCI.

HSDP-IV (2010/2011 - 2015):

- Mainly focused on equity and quality of care.
- Scaled up the HEP to urban and pastoralist communities and improved the quality of services among rural communities.
- Developed a maternal and newborn mortality reduction roadmap.
- Scaled up BEmONC and CEmONC
- Prioritized training for midwives
- Strengthened health infrastructure-construction as well as information and communication technologies (ICT).

HSTP-I (2015/16 - 2019/2020):

HSTP-I had four transformation agendas:

- Transformation in equity and quality of healthcare,
- Growth of a caring, respectful and compassionate (CRC) health workforce,
- Woreda transformation
- Achievement of an information revolution

HSTP-II (2021 - 2025):

HSTP-II had five transformation agendas:

- Strengthening of quality and equity
- Achievement of an information revolution
- Developing a motivated, competent and compassionate (MCC) health workforce
- Increasing health financing
- Providing effective leadership

6.3 National Reproductive Health Strategy (2006-2015 and 2016-2020)

The National Reproductive Health Strategies have been an important contribution to the MNH landscape in Ethiopia (64). The goal of this strategy is to improve the reproductive health of Ethiopian women, men, newborns, adolescents and youth. Six priority areas were identified for intervention: the social and cultural determinants of women's reproductive health; fertility and family planning; maternal and newborn health; HIV/AIDS; reproductive health of young people; and reproductive organ cancers (73). The strategies to address these areas focused on three levels: the community, which comprises the broader social and cultural context of each health issue; the system, which looks at opportunities arising from the delivery of healthcare services; and policy, which examines the institutional and normative frameworks within which decisions are made. This strategy was revised in 2015 to cover the 2016-2020 period (74).

While the strategy had multiple initiatives, key interventions directly related to MNH included: improving access to and utilization of essential MNH services at all levels of the healthcare delivery system; improving the quality of basic and comprehensive emergency obstetric and newborn care (EmONC) services at health centers and hospitals; and strengthening maternal death surveillance and response (MDSR) as well as perinatal death review (PDR) systems to address quality of care for maternal and perinatal health. More broadly, the strategy also aimed to promote a safe and supportive environment, multi-sectoral collaboration and participation in policy and program development as well as improve the availability, motivation and retention of compassionate, respectful and competent reproductive healthcare providers across all regions and at all levels of health facilities. Reproductive health also became a focus within the HEP as of 2006.

6.4 Maternal and Newborn Mortality Reduction Roadmap (2012-2015)

The aim of the roadmap, designed in 2012, was to improve maternal and newborn health, and strengthen the capacity of the health system as well as individuals, families and communities to improve maternal and newborn health (75). The goal of this roadmap was to accelerate the reduction of maternal and newborn morbidity and mortality in order to achieve the MDGs related to maternal and newborn health in Ethiopia.

The major strategies documented in the roadmap are: to work through the Health Development Army (HDA) platform, designed for community engagement, to improve the uptake of key MNH services; ensure access to a core package of MNH services at all levels of the health system including the HEP; strengthen human resources to provide quality skilled care for MNH; improve the nutritional status of pregnant and lactating women and newborns; increase access and coverage of quality EmONC services 24 hours a day, 7 days a week; promote demand and utilization of family planning services by adolescents and youth; and create demand and improve acceptance of family planning through behavior change communication (BCC).

6.5 National Newborn and Child Health Survival Strategy (2005-2015 & 2015-2020)

The National Strategy for Child Survival in Ethiopia was designed in 2005 to address the underlying conditions that accounted for 90% of child mortality plus malnutrition as well as HIV/AIDS, the two most important underlying causes of death (37). The focus was implementation of selected cost effective and high impact interventions to reduce under-five mortality. The Health Services Extension Program (HSEP) is the main pillar of the child survival strategy for increasing access to promotive, preventive and basic essential curative health services to the majority of the underserved population.

Priorities for the child survival strategy included the reduction of neonatal, infant, child, and maternal mortality rates, and ensuring the availability of quality essential healthcare for women and children in the community and health facilities. The strategy focused on cost-effective interventions for pneumonia, neonatal causes (low birth weight, sepsis and asphyxia) malaria, diarrhea, measles, malnutrition, and HIV/AIDS (37).

In 2015, the strategy was revised for the 2016-2020 period. The vision of this revised strategy was that every child in Ethiopia would enjoy the highest attainable standard of health and development with an end to all preventable child deaths by 2035. Its goal was to reduce under-five mortality from the 2013 level of 64/1,000 to 29/1,000, the infant mortality rate from 44/1000 to 20/1000 and NMR from 28/1,000 to 11/1,000 by 2019/20 (37). The objective of the strategy was to ensure effective universal coverage of high impact neonatal and child survival interventions, ensure provision of high quality essential healthcare for mothers, newborns and children at the community and health facility levels, and ensure community empowerment and demand creation for effective use of newborn and child survival interventions while also promoting key family and community care practices (37). In this strategy, the five most effective interventions included for the implementation of the national newborn and child survival strategic plan was to reduce the under-five mortality to 29 per 1,000 live births by 2020 (37).

6.6 Maternal and neonatal health policy tracer indicator

Over the past three decades, there have been major advances in adopting and implementing several globally endorsed policies, action plans and monitoring frameworks for maternal and newborn health policy. Table 6-1 presents key maternal and newborn health policy tracer indicators used to measure the period during which policies were initiated and implemented.

Table 6-1 : Maternal and neonatal health related policy tracer indicators

	Pre-2000	Pre-2000	2000-2005	2006-2010	2011-2015	2016-2020
Legal status of abortion	Pre-2000					
Midwives authorized for specific tasks	Pre-2000					
Postnatal home visits in the first week after birth	Pre-2000					
Maternal Health Commodities (Oxytocin, Misoprostol, Magnesium sulphate)	Pre-2000					
Injectable antibiotics	Pre-2000					
KMC for low-birth-weight babies	2005					
Helping baby's breathing (neonatal resuscitation)	2010					
MgSO4 for management of pregnancy induced hypertension	2010					
Antenatal corticosteroids as part of pre-term labor	2012					
Option B+ for prevention of mother to child transmission (PMTCT)	2013					
Community case management of neonatal sepsis	2013					
Resuscitation equipment	2014					
Chlorhexidine	2014					

6.7 Accelerated policy

Strengthening health infrastructure and resource supply has been central to all HSDPs as one of the main strategies to accelerate the expansion of healthcare delivery systems. In all HSDPs, health facility expansion and rehabilitation, human resource development, strengthening pharmaceutical and medical supply and management through coordination and mobilization of funds and overall strengthening of healthcare financing were points of focus.

6.8 Expansion of primary healthcare facilities in Ethiopia

This initiative was designed during the implementation of HSDP-II to accelerate the expansion of PHC facilities in Ethiopia for the 2005-2009 period (76). The major emphasis of the proposal was equitable geographical location and allocation of PHC resources within the framework of decentralization and healthcare administration. The goal was to provide access to facilities and the availability of modern healthcare in closer proximity to healthcare users.

6.9 "Flooding" policy and expansion of health centers

HSDP-II and HSDP-III prioritized the construction of health posts and centers. This coincided with national policies for expanding the required health workforce to staff these posts. This "flooding strategy" of the health workforce focused on training and deploying HEWs and Health Officers into these newly expanded health centers.

It aimed to rapidly increase the numbers of health staff deployed to health posts in order to meet the ambitious goals in HSDP-II and HSDP-III for coverage into rural areas of Ethiopia.

6.10 Safe abortion law

Ethiopia expanded its abortion law in 2005, which had previously allowed the procedure only to save the mother’s life. This change allowed women to terminate pregnancies that resulted from rape or incest (77,78). The Ministry of Health further facilitated the revision of the law and published technical and procedural guidelines regarding safe abortion in 2014, in response to the change in legislation. The guidelines were intended for use by healthcare providers and program developers at all health institutions recognized by the Ministry of Health. The guidelines are “meant to ensure that women obtain standard, consistent, safe termination of pregnancy services regardless of the level of care of the health institution or the qualification of the service provider.”(79)

6.11 Healthcare financing

Total Health Expenditure

The National Health Accounts study indicated an increase in the total health expenditure over time. In 1995/96 it was US\$ 230 million rising to US\$ 1.6 billion in 2010/11 (an increase of 596%), and then further increasing to US\$ 3.6 billion in 2019/20 (an increase by 127% from 2010/11). The greatest jump in increasing expenditure in health was observed around 2011 and 2013 (Figure 6 2)

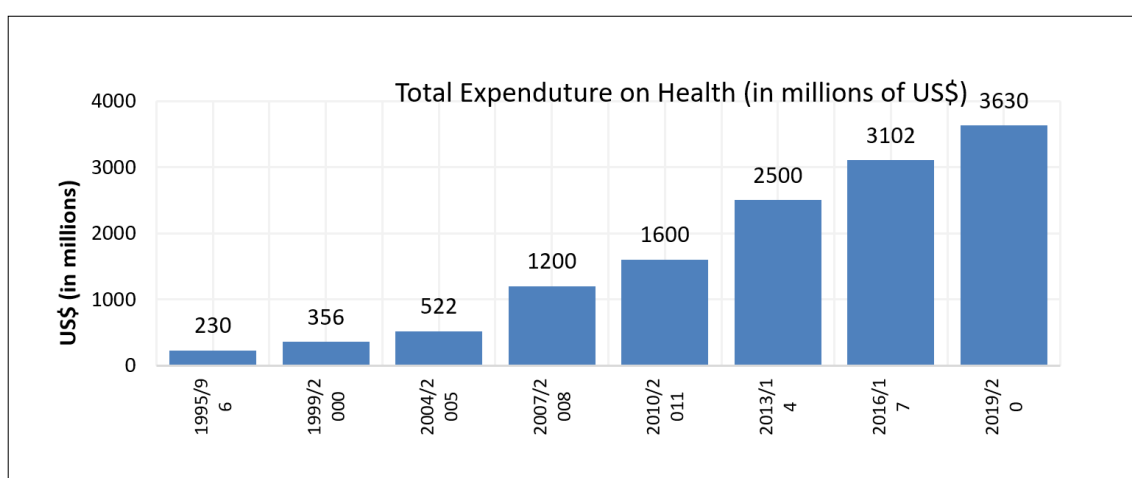


Figure 6-2 : Trends of health expenditure from Health Accounts Survey in Ethiopia, 1995/96-2019/20

Per capita total health expenditure

This is the per capita total expenditure on health (PPT international \$), expressed at the average exchange rate in a given year in US\$. It shows the total expenditure on health relative to the beneficiary population, expressed in Purchasing Power Parity (PPP) to facilitate international comparisons. The per capita total health expenditure increased from US\$ 13.6 in 1995/96 to US\$ 75.6 in 2010/11 and then to US\$ 105.0 in 2019/20, while the pr capita government expenditure on health (PPP) increased from US\$ 5.3 in 1995/96 to US\$ 12.1 in 2010/11 and then to US\$ 34.0 in 2019/20 (Figure 6-3).

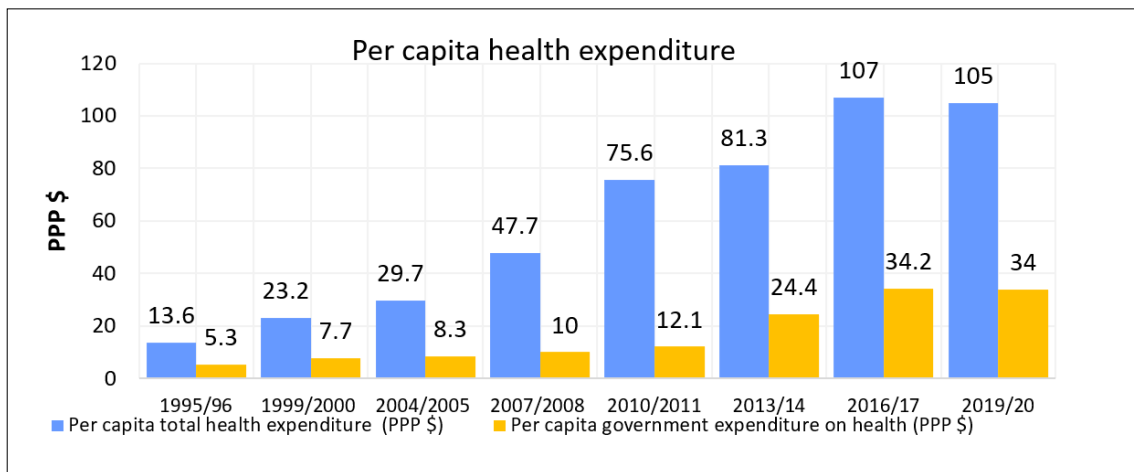


Figure 6-3 : Trends in total health expenditure using PPP adjusted US\$, 1995/1996 - 2019/2020.

The main sources of funding for healthcare expenditure were the government, private sector, external sources and out-of-pocket spending. The government contribution decreased from 39% in 1995/96 to 16% in 2010/11 and then increased to 32% in 2019/20. Health expenditure from donors or external sources increased from 9% in 1995/96 to 35.2% in 2016/17, and then decreased to 34% in 2019/20 with a peak in 2010/11 (50% of total health expenditure) (Figure 6-4). The high out-of-pocket expenditure is a source of concern. It represented over half the total expenditure (53%) in 1995/96, and reduced to 30.6% in 2019/20.

The high out-of-pocket expenditure remains a concern. The free-of-charge maternal health services policy may have had less impact on the utilization of maternal and newborn health services. In 2008, it was shown that many women still paid for supplies and other costs related to normal deliveries (80). Caesarean sections were also not free. Similarly, hidden costs were found to be a major issue in a 2018 study (81).

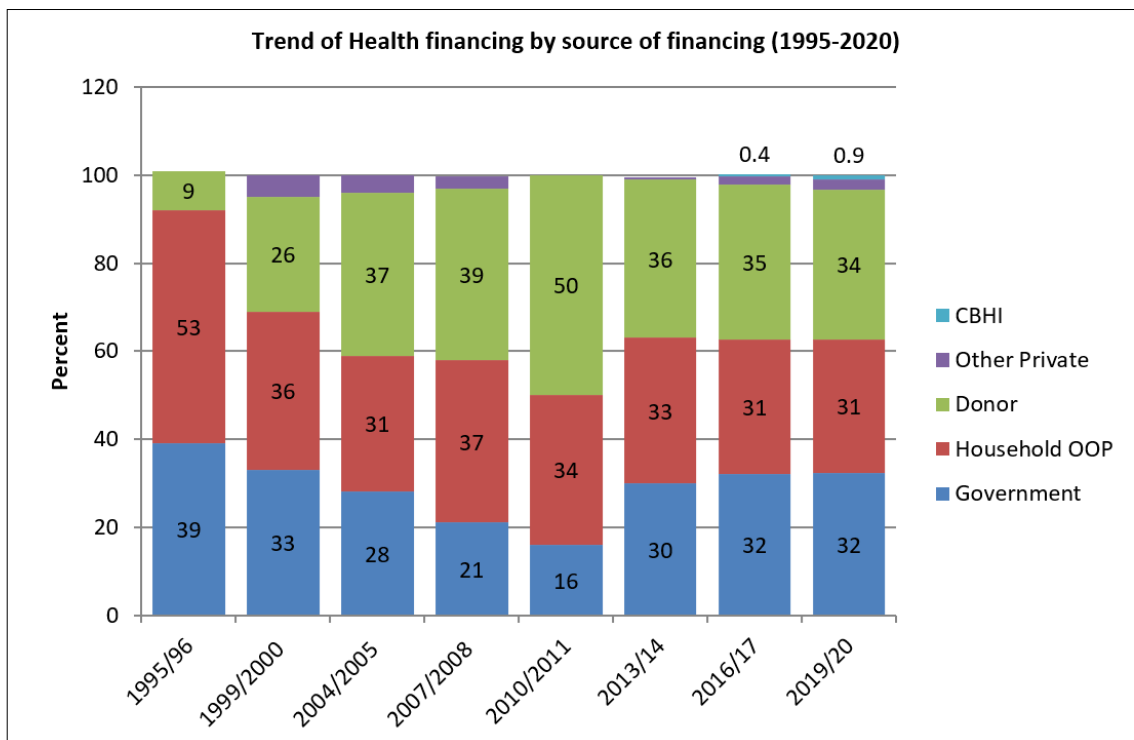


Figure 6-4 : Trends in health expenditure at national level by source, 1995-2020.

Total expenditure on health as a percentage of GDP increased from 3.8% in 1995/6 to 5.2% in 2010/11, rising further to 6.3% in 2019/20 (Figure 6-5). The general government expenditure on health as a percentage of total government expenditure increased from 5.2% in 1995/96 to 8.5% in 2019/20, while the general government expenditure on health as a percentage of GDP remained almost the same except for a small decline in the early 2010s (1.6% in 1995/96, 1% in 2010/11 and 2.0% in 2019/20). The contribution of out-of-pocket spending on health expenditure as a percentage of GDP dropped from 2% in 1995/96 to 1.9% in 2019/20.

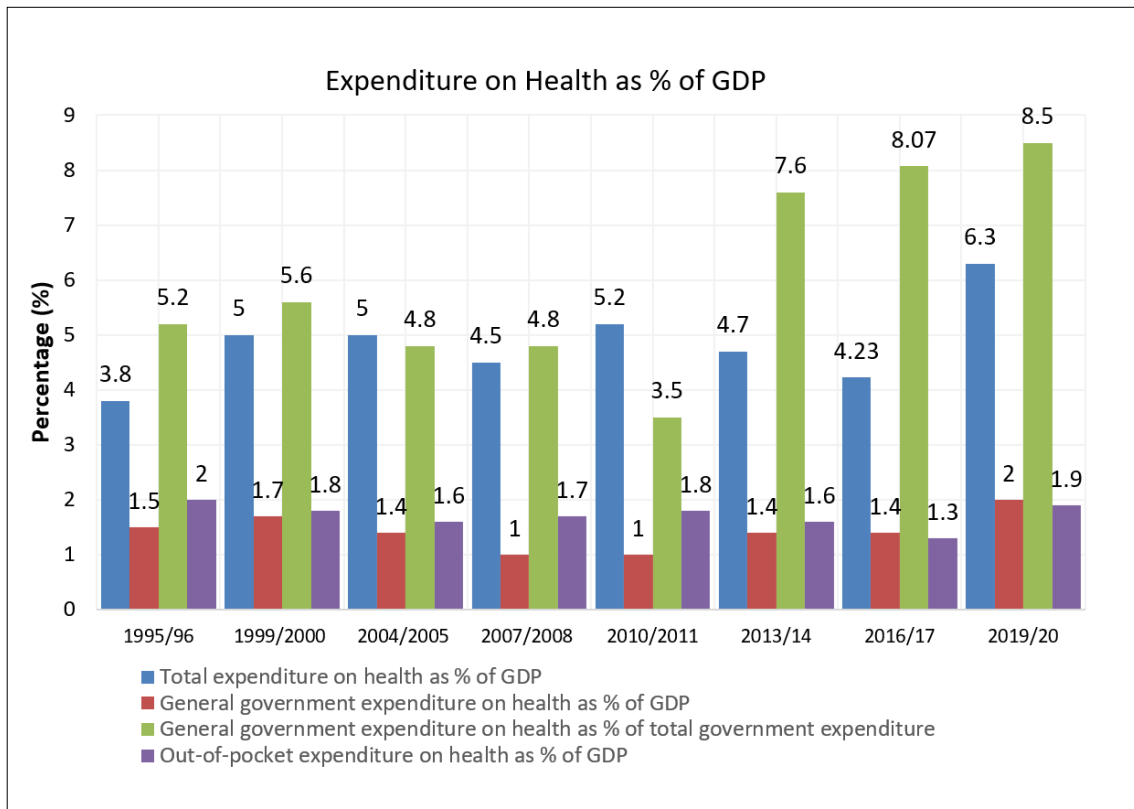


Figure 6-5 : Total health expenditure as a percentage of Gross Domestic Product (GDP), 1995-2020

Catastrophic health spending

Catastrophic health expenditure (CHE) represents out-of-pocket (OOP) payments for healthcare services that exceed a specified threshold of household income or a household's capacity to pay. According to the WHO estimates, household expenditure on health was greater than 10% of the total household expenditure or income. The proportion of population with household expenditure on health spending greater than 10% of the household income was estimated at 1.6% in 1999, and by 2015 had increased to 4.9%. This was higher among urban populations than rural ones (Figure 6-6). In extreme cases, more than 25% of household expenditure was directed towards healthcare spending, and this burden has increased from nearly 0.1% of the population in 1999 to 1.4% in 2015.

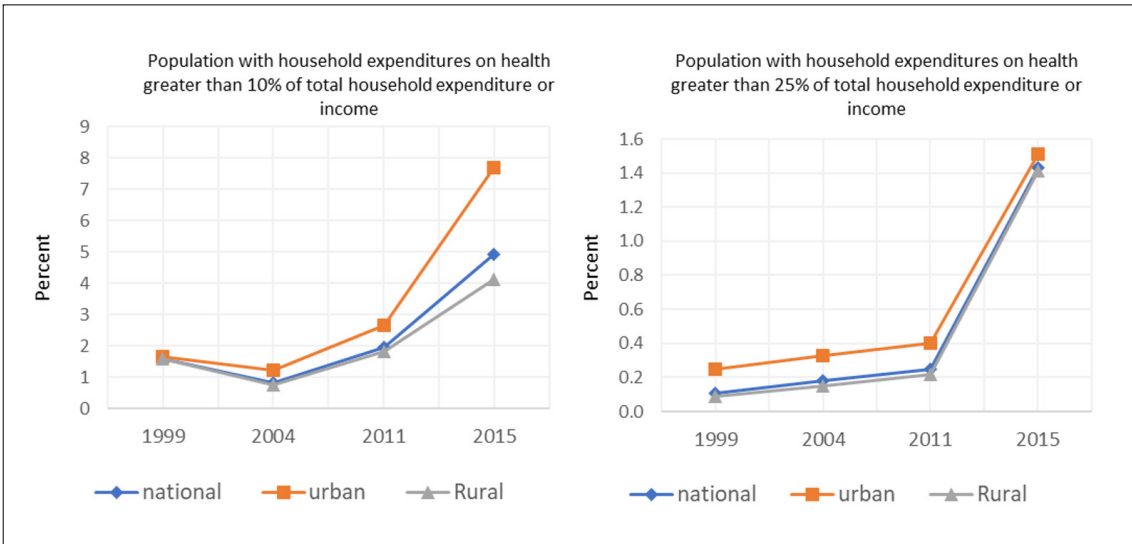


Figure 6-6 : Proportion of population with household expenditures on health from total household expenditure or income, 1999-2015.

The so-called Muskoka-2 database compiles health resource flows from external sources for reproductive, maternal, newborn, child and adolescent health (RMNCAH). The trend follows a similar pattern as the total health expenditure. Health expenditure from external sources for maternal and neonatal health increased from US\$ 15 million to US\$ 117 million in 2018 while spending on reproductive health rose from US\$ 16 million in 2002 to US\$ 181 million in 2018. Maternal and newborn health had its largest amounts of external funding from 2012 (Figure 6-7).

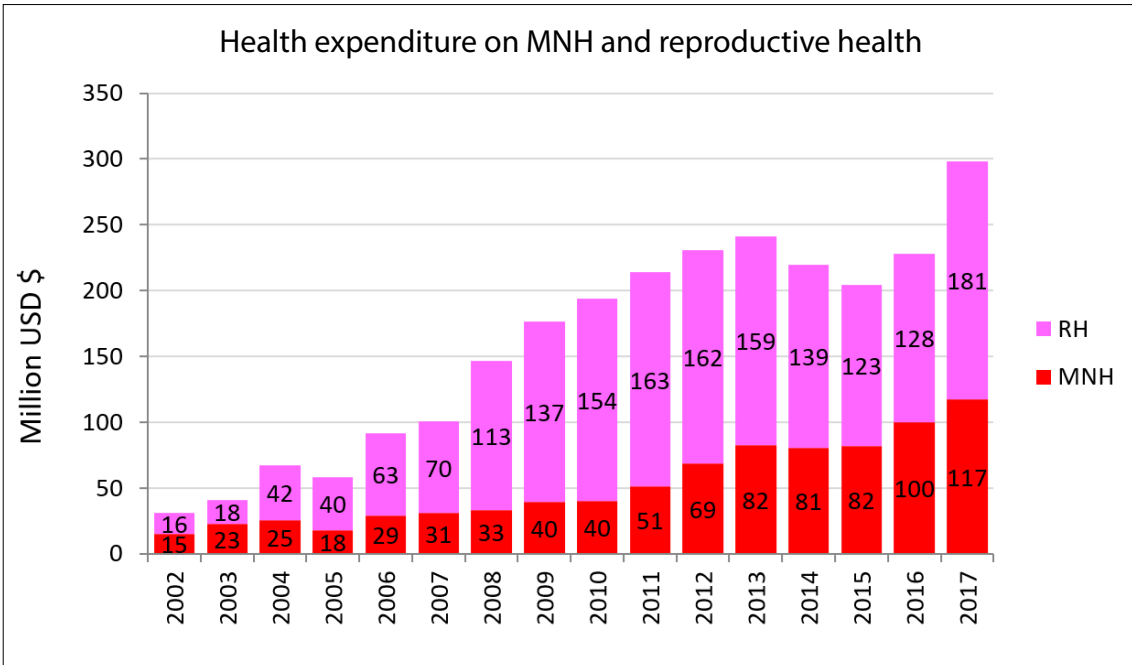


Figure 6-7 : Trends in health expenditure on MNH and reproductive health, 2002-2017

6.12 Community-based health insurance

The Community-based Health Insurance (CBHI) program promotes equitable access to sustainable quality healthcare, works to increase financial protection, and enhance social inclusion. The CBHI benefit package covers all out-patient and in-patient services at the health center and hospital. The 2019 EDHS results show that 28% of households enrolled in the CBHI scheme, with enrolment of rural households at 32% and that of urban households at 19%. Reports show that the number of Woredas implementing the CBHI scheme has increased consistently, from 320 in 2016 to 827 (more than 80% of Woredas) in 2020. The number of Woredas that have started health service provision with CBHI has also increased from 191 in 2016 to 743 in 2020. The national CBHI coverage rate has increased from 38% in 2016 to 50% in 2020. There are geographical disparities in CBHI coverage rate, with the Amhara region having a relatively higher coverage rate (56% in 2016 to 61% in 2020), followed by Tigray region (43% in 2016 to 58% in 2020) and Oromia (26% in 2016 to 44% in 2020).

Studies showed that CBHI schemes can reduce CHE by reducing OOP payments and increasing resource mobilization. The barriers to CBHI enrolment are low levels of awareness, perceptions about high premium amounts, poor perception of quality of services and lack of trust, and are often related to factors such as educational status, household income, family size, occupation, marital status, travel time to the nearest health institution and first choice of place for treatment during illness (82–84). Therefore, strong emphasis should be given to those factors to enhance community health insurance enrolment.

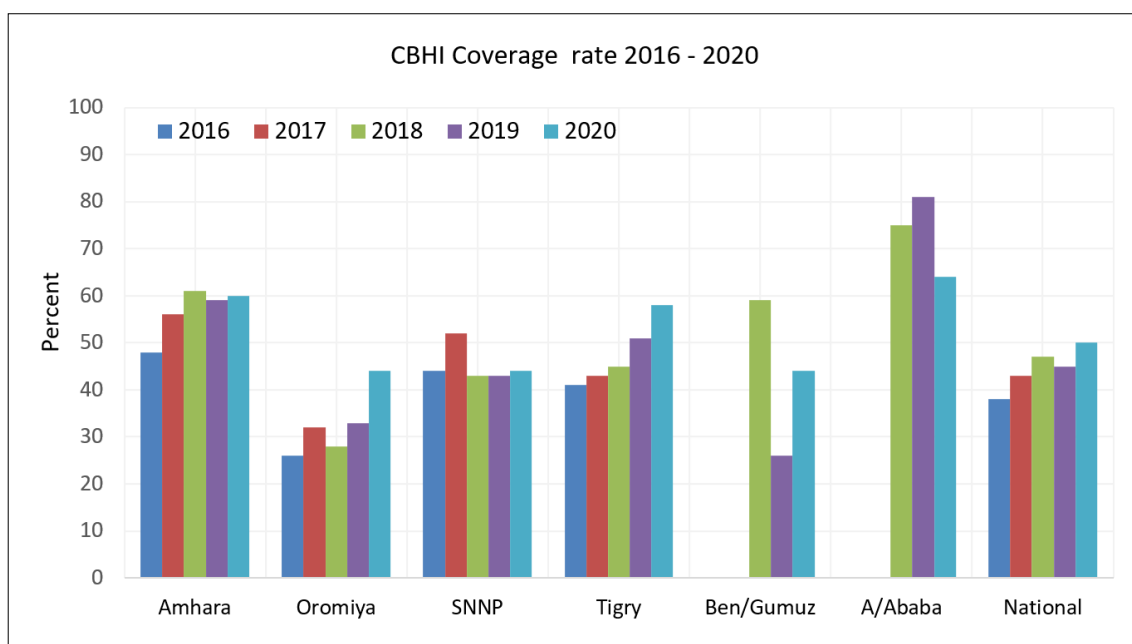


Figure 6-8 : Trends in Community based health Insurance coverage by regions, 2002-2017

6.13 External partners' contributions to healthcare financing

Key external partners

Respondents agreed that external partners had made substantial collective and individual contributions to maternal and newborn mortality reduction in Ethiopia by supporting the country's maternal and newborn health strategies as well as programs and financing. External partners also implemented closely related interventions such as food security and malnutrition-related work, vaccine programs and health infrastructure strengthening. A respondent noted:

'...we are seeing reduced mortality. We are seeing positive outcomes, but these can't happen without our donors. So, they make big contributions!...'

Key bilateral external partners include the US, Japan, the UK, Italy, Spain and Ireland. Multilateral partners include the World Bank, UNICEF, WHO and UNFPA. Other contributions were made by international NGOs and through global health initiatives, including the Global Fund and GAVI-funded country programs. In addition to financial contributions and the supply of medicines, vaccines and other medical products and equipment, external partners also provided substantial technical assistance including health system development activities, capacity and skills building for national and regional Ministry of Health staff, including in monitoring and evaluation, as well as programs for training, supervising, mentoring and motivating health workers. External partners also funded and implemented humanitarian work in regions suffering from droughts and other disasters, albeit with more limited direct impacts on maternal and newborn health.

Issues of dependency and sustainability

Overall, substantial financial contributions to the country's health strategies came from external partners (also noted by Chol and colleagues (85)), although levels of external health financing were reported to be on a downward trajectory, with Ethiopia having stepped up its domestic contributions to health. However, this may not be sufficient to compensate for reductions in external partner funding. Out-of-pocket health expenditures were reported to have increased, as one respondent noted: *'...the partners' contribution is decreasing but government expenditure is still there, no change. So, the health expenditure gap is filled by out-of-pocket expenditure...'*

A related and ongoing challenge was the lack of predictability of some external partners' health financing, including whether some partners would maintain, reduce or stop funds, which might impact on sustaining some health programs. A respondent outlined the problem:

'...this is complicated by declining external resources where you cannot predict who's giving [what] ...in terms of program-based support or flexible budget support...there is a decline in financing of HIV/AIDS, TB or malaria, or family planning [or] MNCH, then we are really in great trouble... we may not even sustain what we have at the moment...'

While respondents hesitated to characterize the country as 'donor dependent', they did say that without current donor funding, the country would need to raise additional domestic financing for health. A respondent described this as a potential future challenge:

'...working towards domestic resource financing increasingly taking over external resources should be a big deal in government's effort at all levels of the system. Yes, we have a draft health financing strategy to address that, but...it's not yet approved. So, I see that as a challenge...'

Other studies have also reported on these issues (86).

Government coordination of external partners

Respondents reflected on the ways national government had effectively coordinated support from multiple external partners, something that many other low- and middle-income countries have struggled with. An important factor was that most external partners, rather than introducing parallel programs and putting government under pressure to adopt their priorities and ways of working, were instead responsive to the Ministry of Health's requests for support and had closely aligned their financial contributions and technical assistance with national priorities, strategies and programs. This was seen as crucial in ensuring that external partners' contributions made substantial impacts in addressing the country's maternal and newborn mortality reduction targets. A respondent captured this point:

'...donor harmonization and alignment...is one of the core strategies by both the Ministry of Finance and the Ministry of Health. So, that really helped to bring them together...'

Respondents identified multiple mechanisms that enabled the national government to effectively coordinate multiple external partners. A key factor enabling strong coordination was the federal government leadership's and political will towards developing a strong, national, community-based primary healthcare strategic plan – the HEP – and the determination to ensure that it would be implemented. The WHO (2015) report, 'Success factors for Women's and Children's Health' also reached this conclusion. One respondent said:

'...many countries have developed strategic plans in Africa; most of them, they write it and put it on the shelf. But the countries that implement them...are Rwanda and Ethiopia. They use it as a Bible...'

The national government had a clearly defined agenda and was not willing to be swayed by the priorities of multiple external partners if they did not align with their own. Indeed, the Ethiopian government pushed external partners to embrace the International Health Partnership Plus initiative that formalized aid effectiveness principles, including better alignment and harmonization of external financing around its national strategies. A respondent remarked:

'...Ethiopia was the first country to really push...development partners to sign the compact...the IHP+. So, that was used as a driver of alignment and harmonization...'

Eventually, external partners were said to have accepted this position, and agreed to support the HEP. A respondent explained:

'...at the initial phase, partners were against it [HEP]..., the government said, "I don't need your funding...but I'm going to do it...we want to manage it through government systems" ...that led to development partners to review their approach to working with the government of Ethiopia...'

Hence, as one respondent put it, external partners eventually came round to supporting Ethiopia's HEP:

'...in terms of alignment of aid and harmonization, I would say...partners are really aligning and owning the strategic plan...'

Respondents confirmed that the Ethiopia's SDG Pooled Fund had positively contributed to maternal and newborn mortality reductions. There are three key channels of external financial assistance for health in Ethiopia. The first channel is received directly by Ethiopia's Ministry of Finance. The second channel is a form of sector support managed by the Ministry of Health, where external partners contribute to the SDG Pooled Fund which is controlled by the Ethiopian government. This was seen as a very strong mechanism to guide external support of government priorities and strategies, therefore making an important contribution to reducing maternal and newborn mortality. As one respondent stated:

'...It is flexible and the MoH uses it for its priorities. It is mainly for improving RMNCH or reduction of maternal and child mortality...'

The third channel was viewed as less impactful on the country's maternal and newborn health strategies. This involved external partners directly funding and implementing their own health programs and projects. As a respondent explained: *'...the partner itself implements using their money. This deteriorates the system. It doesn't have that much benefit...'*

Most external partners support the SDG Pooled Fund, apart from the US. Nevertheless, while the contributions of the US were welcomed, they were not seen as impactful as those funds channeled through the Pooled Fund: *'...USAID doesn't put money in to the SDG pool fund... USAID exceeds all in bringing a lot of money. But it doesn't get into our system...'*

Respondents pointed to a number of donor coordination mechanisms that were seen as helping to effectively align multiple external partners and their programs with Ethiopia's country strategies. These included coordination groups and committees, the Joint Assessment of National Health Strategies (JANS) process and a resource mapping process. *External partner coordination groups and committees*, including a number of Technical Working Groups and the Joint Coordinating Committee, were important mechanisms for exchange of information and transparency about external partners' work and to help the government coordinate multiple externally funded programs on the ground. A respondent clarified that these had been effective, especially when they were first introduced:

'...donor coordination mechanisms...the Joint Coordinating Committee...these structures were really [good] compared to other countries, but now they are dying out because of fatigue...'

External partners also contributed to Ethiopia's country-led JANS, which was not only seen by respondents as an effective mechanism for strengthening the country's national plans, it also helped to ensure external financing was closely aligned with country strategies, thereby maximizing the impacts of their contributions. A respondent explained:

'...the Joint Assessment of National Strategies started in Ethiopia in 2010 and partners... are expected to... review the quality of the strategic plan before it's endorsed...then both government and partners endorse that plan and ...partners have to stick to that; government has to stick to that...'

Additionally, the Ministry of Health-led *resource mapping process* helped to identify external finances and ensure these were transparent and directly contributed to national strategies and plans. One respondent said:

'...even if donors are financing outside the government, they need to reflect to whom they are providing and how much they are providing and which activity. So, all the resources of partners started to be mapped annually to inform the planning process. That helped to bring the resources that are on budget, the resources that are off budget, to come under one umbrella...'

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