

Taking Stock and Looking Ahead: Ethiopia's Quarter Century of Change in Demography and Health, 2000–2025, and Prospects to 2050

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Abstract

Over the past quarter-century, Ethiopia has experienced significant improvements in demographic and health outcomes. This chapter examines trends in reproductive health, maternal health, and child health using nationally representative data from the Ethiopia Demographic and Health Survey (EDHS) series conducted between 2000 and 2025. Eight core indicators are analyzed: family planning demand and contraceptive use, fertility rates, early childhood mortality, skilled birth attendance, childhood vaccination coverage, childhood nutritional status, exclusive breastfeeding practices, and pregnancy-related mortality ratios. The EDHS surveys provide consistent population-based data that enable long-term analysis of demographic and health transitions across time. This analysis combines descriptive trend analysis with contextual interpretation based on international monitoring frameworks and peer-reviewed research. Indicators were examined across successive EDHS rounds to identify long-term changes in reproductive behavior, maternal health service utilization, and child survival outcomes. The results demonstrate substantial improvements across most indicators. Modern contraceptive use increased significantly, contributing to declining fertility rates. Early childhood mortality has fallen markedly, reflecting improvements in primary health care, immunization coverage, and maternal health services. Skilled birth attendance has expanded rapidly, improving maternal and newborn outcomes. Nutritional indicators show gradual improvement, although chronic undernutrition remains a challenge. Exclusive breastfeeding rates remain hovering stagnantly around the 50th percentile - relatively high compared with many low-income settings - contributing to improved child survival. Finally, pregnancy-related mortality has declined substantially, although it remains above global targets.

These improvements coincide with major health system reforms, including the expansion of Ethiopia's primary health care infrastructure and the introduction of the Health Extension Program, which deployed community health workers to provide preventive services in rural communities. The Ethiopian experience illustrates how sustained investments in community-based health systems, reproductive health services, and maternal and child health programs can produce broad improvements across multiple demographic and health indicators. Continued progress will depend on addressing remaining regional and socioeconomic disparities and strengthening the quality and accessibility of health services nationwide.

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Introduction

Ethiopia has experienced one of the most significant demographic and public health transformations in sub-Saharan Africa over the past quarter-century. Improvements in reproductive health services, maternal health care, and child survival have contributed to substantial shifts in fertility, mortality, and health service utilization. These changes reflect both national policy initiatives and broader global efforts to strengthen maternal and child health systems in low- and middle-income countries [1–4].

Understanding these developments requires situating recent health improvements within Ethiopia's longer demographic history. Ethiopia's modern demographic data system began with the first national population and housing census conducted in 1984. That census estimated the country's population at approximately 42 million people [5]. A decade later, the 1994 national census recorded a population of nearly 53 million, indicating rapid population growth during the late twentieth century [6].

During this period, Ethiopia's demographic profile reflected characteristics typical of many low-income countries. Fertility rates were estimated to exceed six children per woman, while infant and child mortality remained high, and maternal mortality was among the highest in the world [5-7]. Limited access to health services, low contraceptive prevalence, and widespread rural poverty contributed to high population growth rates and substantial health challenges.

By the late 1990s, Ethiopia's population had grown to an estimated 65 million people, increasing demand for health services, education, and social infrastructure [8]. At the same time, global health initiatives and national policy reforms began emphasizing expanded access to reproductive health services, maternal health care, and child survival interventions.

Over the past quarter century, Ethiopia's population has continued to grow rapidly, reflecting both historically high fertility and gradually declining mortality. According to estimates from the United Nations Population Division and the World Bank, Ethiopia's population increased from roughly 65 million in the late 1990s to approximately 77 million by the 2007 national census and surpassed 100 million by the mid-2010s [9]. This rapid demographic expansion placed increasing pressure on the country's health system, education sector, labor markets, and natural resources while also highlighting the urgency of expanding access to reproductive health services and maternal and child health programs.

Population growth has continued into the present decade. Recent international demographic estimates suggest that Ethiopia's population exceeded 120 million in the early 2020s and is projected to reach approximately 128–130 million by 2026, making it the second most populous country in Africa after Nigeria and one of the largest in the world [7]. Despite this rapid population growth, Ethiopia has also seen measurable

improvements in key demographic and health indicators, including declining fertility rates, reductions in child mortality, and increased utilization of maternal health services. These parallel trends—continued population growth alongside improvements in reproductive and child health outcomes—illustrate the complex demographic transition underway in Ethiopia during the first quarter of the twenty-first century.

Major health system reforms were introduced in the early 2000s, most notably Ethiopia’s Health Extension Program (HEP), launched in 2003. The program deployed trained health extension workers to rural communities to provide preventive health services, including family-planning counseling, immunization outreach, maternal health education, and disease-prevention programs [10][11]. The expansion of primary health care infrastructure and community-based health services significantly improved access to basic health interventions.

Since 2000, Ethiopia has conducted repeated rounds of EDHS, providing nationally representative household data on fertility, family planning, maternal health, and child health indicators. The EDHS series conducted in 2000, 2005, 2011, 2016, and 2024–25 enables consistent monitoring of demographic and health trends over time and has become one of the most widely used sources of evidence for evaluating health progress in Ethiopia [1–4][12].

This chapter takes stock of Ethiopia’s demographic and health transformation between 2000 and 2025 by examining eight key indicators derived from EDHS data: family planning utilization, fertility trends, early childhood mortality, skilled birth attendance, childhood vaccination coverage, childhood nutrition, exclusive breastfeeding practices, and pregnancy-related mortality ratios.

Examining these indicators together provides a comprehensive perspective on how reproductive health services, maternal health care, and child survival interventions interact within Ethiopia’s evolving health system.

Family Planning

Over the past quarter-century, Ethiopia has experienced major transformations in reproductive health services and family planning utilization. At the beginning of the 2000s, the country faced high levels of unmet need for contraception and low modern contraceptive prevalence. However, sustained policy commitment, large-scale expansion of primary health care, and community-based interventions have significantly improved access to and use of modern contraceptive methods [1–4]. These changes are reflected in national survey data and in international monitoring frameworks such as FP2030 and the Sustainable Development Goals [5][6]. The 2000 EDHS reported that only about 6 percent of married women were using modern contraceptive methods, while the unmet need for family planning exceeded one-third of married women [1][7]. Structural barriers

included limited service availability, shortages of trained health personnel, and geographic barriers to accessing health facilities [8][9].

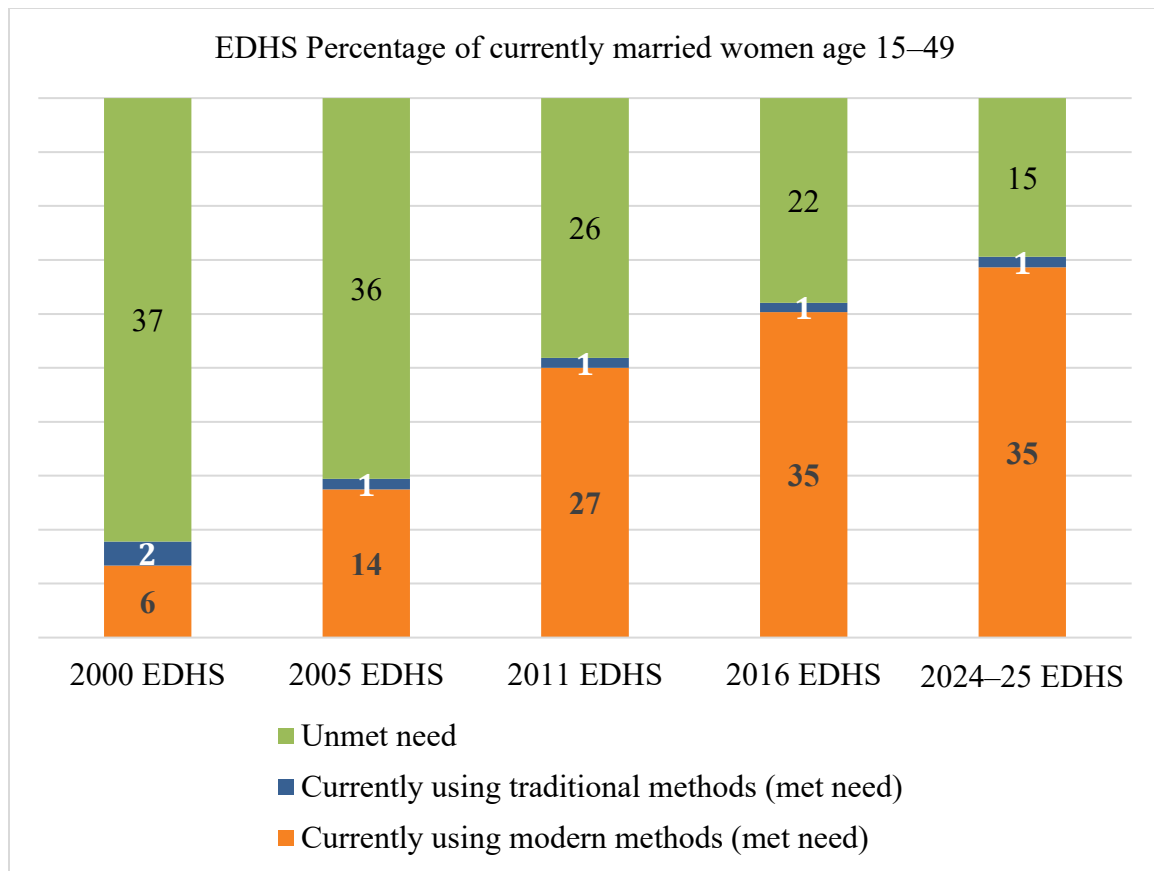
Health System Reforms and the Health Extension Programs: A major turning point occurred in 2003 with the introduction of Ethiopia's Health Extension Program (HEP). This initiative deployed trained health extension workers to rural communities to provide preventive and basic curative services, including family planning counseling and selected contraceptive methods [10]. Evidence shows that the program substantially improved contraceptive uptake, particularly in rural areas where access to services had historically been limited [11][12]. Since then, Ethiopia has recorded one of the fastest increases in contraceptive use in Sub-Saharan Africa.

Modern contraceptive prevalence among married women rose to more than 35 percent by 2016 [1][13]. Expansion of primary health care infrastructure, improved commodity supply chains, and increased reproductive health awareness all contributed to this change [14]. Injectable contraceptives remain the most used modern method, followed by implants and oral contraceptives [15]. As contraceptive availability expanded, the unmet need for family planning declined considerably. Analysis of EDHS data shows that unmet need among married women declined from roughly 37 percent in 2000 to around 22 percent by the mid-2010s [2]. Nevertheless, unmet need remains unevenly distributed geographically and socioeconomically, particularly among rural and poorer households [16][17].

Important disparities remain across Ethiopia's regions and population groups. Urban areas generally have higher contraceptive prevalence than rural or pastoralist regions due to better infrastructure and education levels [18]. Adolescents and young married women also face greater barriers to accessing family planning services, including social norms supporting early childbearing and limited autonomy in reproductive decision-making [19][20].

The trends depicted in Figure 1 illustrate Ethiopia's transition from a high-unmet-need environment to one where a growing proportion of reproductive demand is satisfied through modern contraceptive use. Over time, the proportion of women with unmet need has declined while the proportion using modern methods has increased substantially. The relatively small share of traditional method use suggests that progress has been driven largely by expanded access to modern contraception rather than substitution between traditional and modern practices.

Figure 1: Demand For Family Planning Over Time

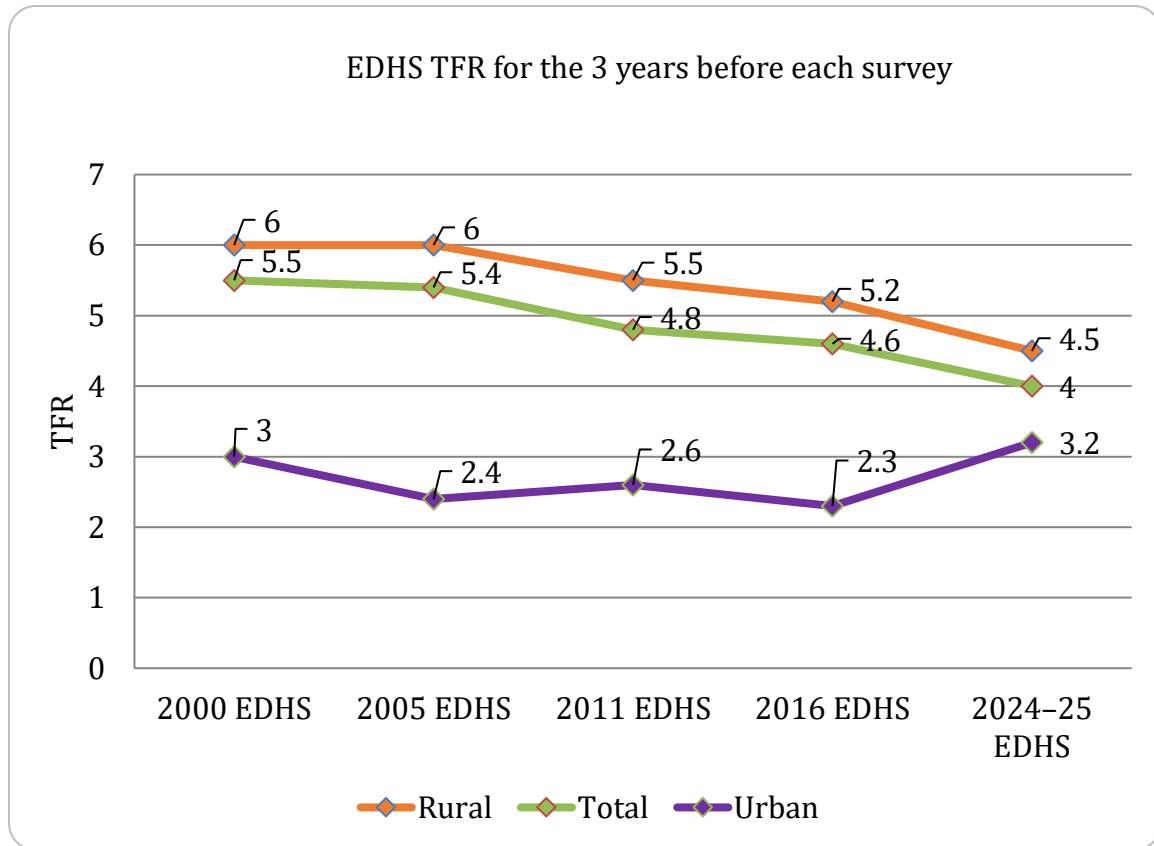


Overall, Ethiopia’s experience over the past twenty-five years represents a major public health achievement. In a context characterized by low contraceptive use and high unmet need, the country has achieved substantial improvements through policy commitments, the expansion of primary health care, and community-based service delivery programs. Continued investment in equitable access to reproductive health services will be essential to sustain progress and further reduce unmet need nationwide.

Fertility

Figure 2 summarizes Ethiopia’s Total Fertility Rate (TFR)—the average number of children a woman would have over her lifetime—for the three years preceding each survey, disaggregated by residence (rural vs. urban) and compared with the national total. The primary data source is the EDHS series (2000, 2005, 2011, 2016) and the most recent EDHS round shown on the slide (2024–25). DHS surveys are the standard population-based source of data for fertility, family planning, and maternal/child health indicators in Ethiopia and enable consistent comparisons over time [1–5].

Figure 2. Trends in Fertility by Residence



National fertility declines over two and a half decades: Ethiopia’s national fertility has declined substantially since 2000. In the EDHS series, the national TFR fell from roughly 5–6 children per woman around 2000 to the mid-4 range by 2016, reflecting a broad fertility transition underway in the country [1–4]. World Bank time-series indicators, which compile and harmonize national demographic estimates, also show a long-run decline in fertility for Ethiopia [6]. While the level of fertility remains higher than in many middle-income contexts, the directional shift is consistent with expanding contraceptive access, increasing female education, and changes in reproductive preferences [7–9].

Persistent Urban–Rural Fertility Gap: A defining feature of Ethiopia’s demographic profile is the large urban–rural fertility differential. Across DHS rounds, rural fertility remains substantially higher than urban fertility, reflecting differences in education, labor market opportunities, age at marriage, and access to services [1–4][10]. Urban areas generally have denser health infrastructure and greater access to family planning and maternal health services, which support birth spacing and smaller desired family size [8][11]. The persistence of a wide gap underscores that national averages can mask large

inequities in reproductive outcomes and the enabling conditions that shape fertility behavior [10][12].

Key Drivers of Fertility Change: Multiple pathways contribute to Ethiopia’s fertility transition. Expanded access to modern contraception is central: modern contraceptive use increased sharply over the 2000–2016 period in DHS data, especially among married women, and is strongly associated with reduced fertility and longer birth intervals [2–4][13]. HEP been widely cited as a major mechanism for improving rural access to basic services, including family-planning counseling and selected methods, by placing trained providers in close proximity to households [14]. In addition, rising female education is consistently associated with delayed marriage, increased autonomy, and lower desired fertility [9][15]. Urbanization and structural economic change also influence fertility through shifts in costs of child-rearing and changing aspirations, particularly in cities and peri-urban areas [16].

Regional and Equity Considerations: Even within “urban” and “rural,” fertility differs markedly by region, wealth, and women’s education. DHS reports have long documented higher fertility in predominantly rural and pastoralist regions such as Afar and Somali, where geographic access constraints and service coverage gaps can be more pronounced [3][4]. In contrast, Addis Ababa has consistently reported among the lowest fertility levels nationally, reflecting high female education, greater employment opportunities, and strong access to reproductive health services [3][4]. Policy and program strategies that target underserved regions, adolescents and youth, and postpartum women are particularly important for equitable progress in fertility outcomes and reproductive autonomy [11][12][17].

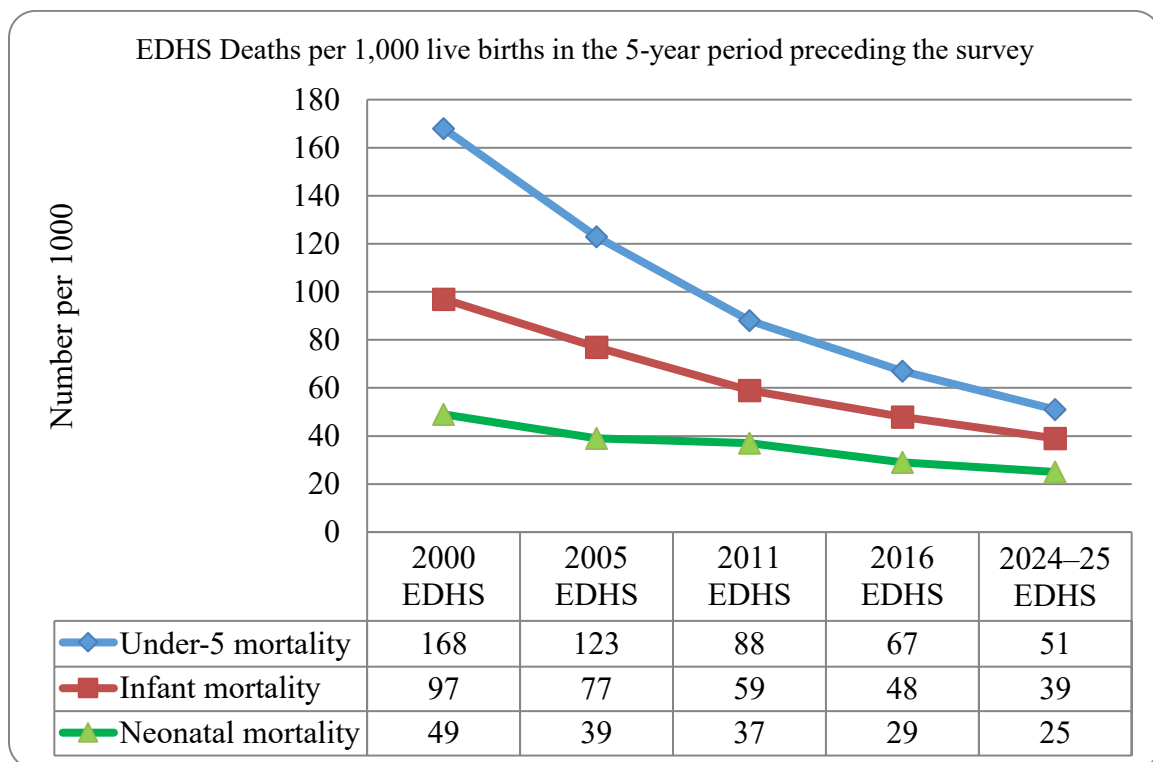
The most recent survey suggested continued national fertility decline relative to earlier survey rounds and ongoing urban–rural divergence. When interpreting the latest estimate, it is good practice to consider potential differences in survey timing, sampling, and contextual shocks (e.g., displacement, economic disruption) that can affect short-term fertility measurement. Nonetheless, the overall pattern across the full series remains clear: fertility is trending downward nationally, urban fertility remains lowest, and rural fertility remains highest—implying that continued progress depends on sustaining access, quality, and equity in reproductive health services [1–6][11].

In sum, Ethiopia’s fertility decline is compatible with sustained investment in voluntary, rights-based family planning and maternal health systems. Secondly, the persistent rural disadvantage highlights the need for last-mile delivery, reliable commodities, and high-quality counseling in remote communities, including pastoralist areas [11][14][18]. Thirdly, social determinants—especially girls’ education and women’s economic opportunities—remain essential “upstream” levers; these should be treated as core components of a fertility transition strategy, not secondary add-ons [9][15][16].

Early Childhood Mortality

Figure 3 tracks Ethiopia’s under-five mortality rate (U5MR), infant mortality rate (IMR), and neonatal mortality rate (NMR) as deaths per 1,000 live births in the five-year period preceding each survey. These metrics are standard DHS child-survival indicators and are widely used to assess progress toward global child mortality targets, including SDG 3.2.1 (under-five mortality) and SDG 3.2.2 (neonatal mortality) [1–4]. The EDHS series (2000, 2005, 2011, 2016) provides consistent, population-based estimates for monitoring national trends [1–3].

Figure 3: Trends in Early Childhood Mortality Rates



Long-Run Declines in Child Mortality: Ethiopia has achieved substantial reductions in early childhood mortality over the last quarter-century. The EDHS series documents a large decline in under-five mortality from the early 2000s through the mid-2010s [1–3], and international monitoring systems (e.g., UN IGME and World Bank time series) similarly show sustained progress in child survival [5][6]. These improvements reflect a combination of strengthened primary health care, expanded immunization and infectious disease control, and gains in nutrition and maternal health services [7–10].

Infant Mortality Trends: Infant mortality (deaths before age one) declined markedly over time, indicating improvements in antenatal, intrapartum, and postnatal care, as well as better management of childhood infections [1–3][8]. Expanded access to essential child

health interventions—such as immunization, improved treatment of diarrhea and pneumonia, and malaria control—has been repeatedly linked to declines in infant and child deaths across low- and middle-income settings [7][9][11].

Neonatal Mortality and the “Last-Mile” Challenge: Neonatal mortality (deaths in the first 28 days of life) has also declined, but typically more slowly than overall under-five mortality. This pattern is consistent with global evidence showing that as deaths among older infants and children fall, a larger share of remaining mortality is concentrated in the neonatal period [5][12]. Neonatal deaths are disproportionately driven by complications of prematurity, intrapartum-related events, and infections—conditions that are highly sensitive to the quality of care during pregnancy, childbirth, and immediate postnatal care [12–14].

HEP is widely cited as a key platform for expanding preventive and basic curative services at the community level, including maternal and child health, immunization, health promotion, and referral linkages [10][15]. HEP and related primary-care expansions have been associated with improved service coverage for child survival interventions, particularly in rural areas [10][15][16]. In parallel, national and partner-supported programs strengthened vaccine delivery and child health platforms, contributing to reductions in vaccine-preventable mortality [9][11][17].

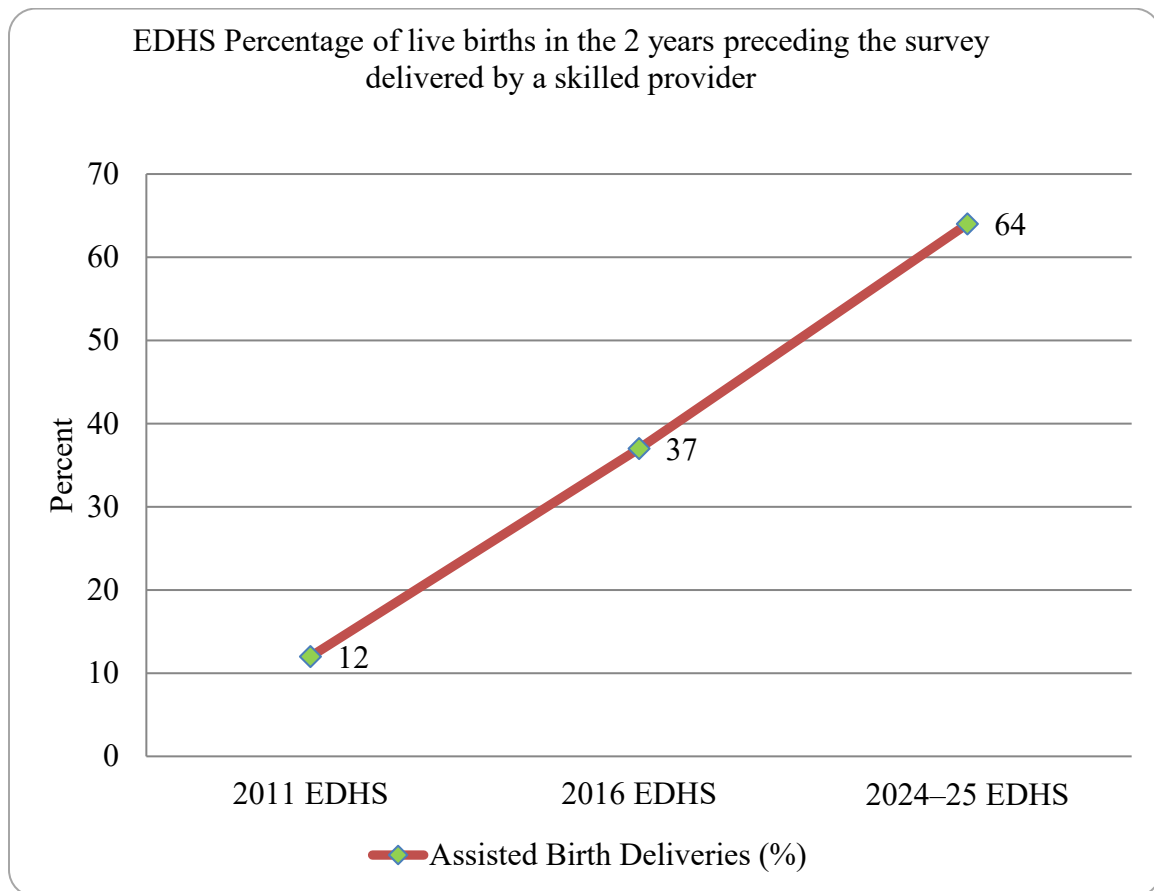
Equity and Regional Considerations: National averages can mask large within-country disparities. DHS reports, and secondary analyses frequently document regional and socioeconomic differences in child mortality and service coverage, reflecting variation in access, geography, and underlying social determinants [2][3][18]. Equity-focused strategies—including strengthening quality of facility delivery, emergency obstetric and newborn care, and referral systems in underserved regions—are essential to sustain progress and ensure gains are shared across populations [13][14][19].

Overall, there are two important lessons here. First, Ethiopia’s improvements in child survival over 2000–2025 are among the most notable public-health gains in the country’s recent history, aligning with international datasets documenting steep declines in child mortality [5][6]. Second, the slower pace of neonatal mortality decline indicates that further reductions in under-five mortality will increasingly depend on improving the quality and continuity of maternal and newborn care—especially skilled birth attendance, intrapartum monitoring, neonatal resuscitation capacity, infection prevention, and postnatal follow-up [12–14][19][20].

Assisted Birth Deliveries

Figure 4 illustrates the rapid expansion of assisted or skilled birth deliveries in Ethiopia. The chart shows the percentage of births attended by skilled health personnel for three survey rounds of the DHS surveys — 2011, 2016, and 2024–25. Skilled birth attendance is a critical indicator for monitoring maternal and newborn health outcomes and is closely linked to global development goals under Sustainable Development Goal (SDG) 3, which aims to reduce maternal mortality and improve maternal health services [1–4].

Figure 4. Assisted Birth Delivery Trends



Growth in Skilled Birth Attendance: The increase in assisted birth deliveries in Ethiopia has been dramatic over the last decade. According to EDHS data, skilled birth attendance rose from roughly 12 percent in 2011 to approximately 37 percent in 2016 and further increased to about 64 percent in the most recent survey period. This trend reflects expanding access to health facilities, improvements in transportation and referral systems, and increasing awareness among families of the benefits of facility-based childbirth with trained health professionals [2][3][5].

Health System Drivers: Several major health system reforms contributed to the rise in assisted deliveries. HEP expanded community-level health services and strengthened links between rural households and primary health care facilities. Health extension workers played a key role in promoting antenatal care, birth preparedness, and referrals for facility delivery [6][7]. At the same time, investments in maternal health infrastructure, including the construction of health centers and training of midwives and skilled birth attendants, significantly improved service availability across both rural and urban areas [8][9].

Impact on Maternal and Newborn Health: Increasing the proportion of births attended by skilled health professionals is one of the most effective interventions for reducing maternal mortality and neonatal deaths. Skilled attendants can identify complications during labor, provide life-saving interventions such as emergency obstetric care, and ensure safe newborn resuscitation and immediate postnatal care [10–12]. Global evidence consistently shows that countries experiencing increases in skilled birth attendance often see parallel declines in maternal and early neonatal mortality [10][11][13].

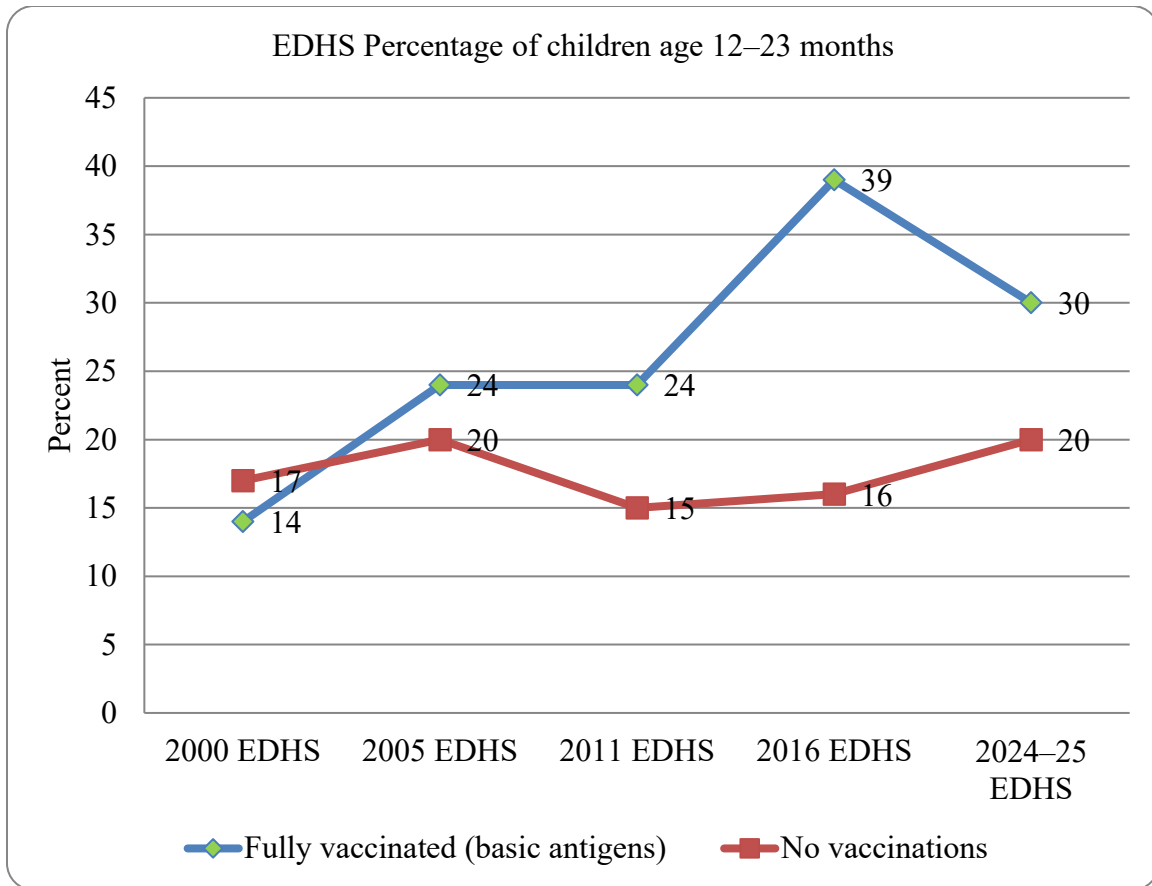
Remaining Challenges: Despite substantial progress, disparities remain between urban and rural areas and across regions. Access barriers such as transportation difficulties, shortages of skilled health personnel in remote areas, and cultural preferences for home births continue to influence delivery practices in some communities [3][14]. Addressing these gaps requires continued investment in maternal health infrastructure, strengthening emergency obstetric care, and ensuring equitable access to skilled providers across Ethiopia’s diverse geographic regions [9][14][15].

The overall message in Figure 4 is that Ethiopia has experienced one of the most rapid expansions in skilled birth attendance in sub-Saharan Africa over the past decade. The sharp upward trajectory—from approximately one in eight births attended by skilled personnel in 2011 to nearly two-thirds of births today—illustrates major improvements in maternal health service utilization. Continued progress will depend on improving service quality, strengthening referral systems, and ensuring that the remaining population delivering at home can access skilled care when needed [8][10][16].

Childhood Vaccination

Figure 5 illustrates trends in childhood vaccination coverage in Ethiopia, based on the EDH data. The chart compares two key indicators: the proportion of children who are fully vaccinated with basic antigens and the proportion of children who have received no vaccinations. These indicators are widely used in global health to assess the reach and effectiveness of national immunization programs and to monitor progress toward child survival goals under Sustainable Development Goal (SDG) 3 [1–4].

Figure 5: Trends in childhood vaccinations



Over the past two decades, Ethiopia has made measurable progress in expanding childhood vaccination coverage. EDHS data show that the share of children fully vaccinated increased from approximately 14 percent in 2000 to around 24 percent in both 2005 and 2011, rising further to about 39 percent by 2016 before declining to roughly 30 percent in the most recent survey period. These improvements reflect expanded outreach services, investments in primary health care, and international partnerships supporting vaccine delivery [2][5][6].

Reduction in Zero-Dose Children: The proportion of children receiving no vaccines—often referred to as “zero-dose children” in global immunization literature—declined during the early years of Ethiopia’s immunization scale-up but has fluctuated in more recent years. EDHS estimates indicate that the share of children with no vaccinations fell from about 17 percent in 2000 to roughly 15 percent in 2011, but later increased slightly in subsequent survey rounds. Reducing the number of zero-dose children has become a major priority in global immunization strategies because these children often live in underserved communities with limited access to health services [7][8][9].

HEP has played a central role in improving vaccination coverage. Introduced in the early 2000s, the program deploys trained community health workers who provide preventive services, including immunization outreach, health education, and referrals to primary health facilities. Evidence suggests that the HEP contributed significantly to improved child health outcomes by expanding access to basic services in rural areas [10][11][12].

Global Partnerships and Immunization Programs: Ethiopia's vaccination progress has also been supported by global health partnerships. Organizations such as Gavi, the Vaccine Alliance, UNICEF, and the World Health Organization have provided financial resources, technical assistance, and vaccine procurement mechanisms that strengthened the national immunization program. These partnerships have enabled Ethiopia to expand coverage for essential vaccines such as measles, polio, diphtheria, pertussis, and tetanus [13][14][15].

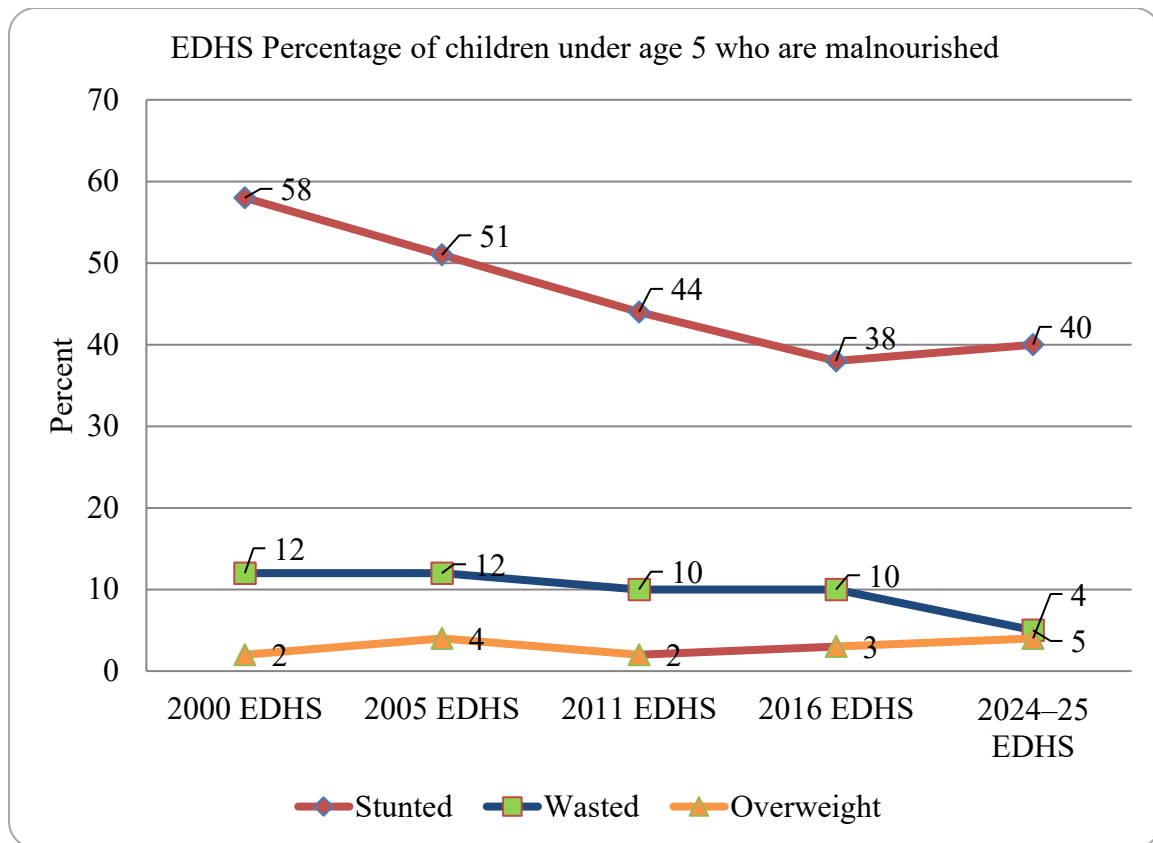
Challenges and Equity Considerations: Despite progress, vaccination coverage remains uneven across regions and socioeconomic groups. Rural communities, pastoralist populations, and households with lower levels of maternal education often experience lower immunization coverage. Geographic barriers, health workforce shortages, and supply chain constraints can limit consistent vaccine delivery in remote areas. Addressing these inequities is critical for ensuring that immunization programs reach all children [16][17][18].

Overall, the trends shown in Figure 5 highlight both the successes and remaining challenges of Ethiopia's immunization program. Expanding full vaccination coverage while simultaneously reducing the number of zero-dose children will require strengthening primary health care systems, improving cold-chain logistics, and expanding community outreach. Sustained investments in immunization are essential not only for preventing infectious diseases but also for maintaining the broader gains in child survival documented in Ethiopia over the past quarter century [4][14][19][20].

Childhood Nutrition

Figure 6 illustrates trends in three widely used indicators of child nutritional status - stunting, wasting, and overweight - among children under five years of age. These indicators are derived from anthropometric measurements collected through successive rounds of the EDHS. Stunting reflects chronic undernutrition, wasting reflects acute undernutrition, and overweight captures emerging risks related to excess nutrition. Together, these indicators provide a comprehensive view of the nutritional environment affecting child health and development in Ethiopia and are widely used in global health monitoring frameworks such as the Sustainable Development Goals and the Global Nutrition Targets [1–4].

Figure 6. Trends in childhood nutrition in Ethiopia



The trends shown in Figure 6 demonstrate meaningful improvements in child nutrition in Ethiopia over the past two decades. However, persistent levels of chronic undernutrition highlight the need for sustained investment in early childhood nutrition programs, maternal health services, and food security initiatives. Multisectoral strategies will remain essential for achieving further reductions in child malnutrition and meeting global nutrition targets.

Long-Term Trends in Stunting: Stunting—defined as low height-for-age—reflects long-term nutritional deprivation and repeated exposure to illness during early childhood. EDHS data demonstrate a gradual decline in the prevalence of stunting from approximately 58 percent in 2000 to about 38 percent in 2016, with modest fluctuations in recent surveys. Despite these improvements, roughly one-third of Ethiopian children under five remain stunted, highlighting persistent challenges related to food security, dietary diversity, and maternal nutrition [2][8][10].

Trends in Wasting: Wasting—defined as low weight-for-height—is an indicator of acute malnutrition. In Ethiopia, wasting has declined from about 12 percent in 2000 to roughly 5 percent in the most recent survey period. Although this trend reflects improvements in

food security and health services, wasting remains a critical concern because it is strongly associated with increased risk of child mortality [3][9][12].

Emerging Trends in Childhood Overweight: While undernutrition remains the dominant nutrition challenge in Ethiopia, the presence of childhood overweight illustrates the emerging double burden of malnutrition. As dietary patterns change and urbanization increases, populations may experience both undernutrition and overnutrition simultaneously. Monitoring trends in overweight is therefore important to ensure balanced nutrition policies [4][14].

Drivers of Nutrition Improvement: Several factors have contributed to improvements in child nutrition outcomes in Ethiopia. National health and nutrition strategies have emphasized community-based health services, improved maternal and child health care, and expanded preventive services through Ethiopia's HEP. These programs promote breastfeeding, complementary feeding, immunization, sanitation, and maternal nutrition education [15][16][17].

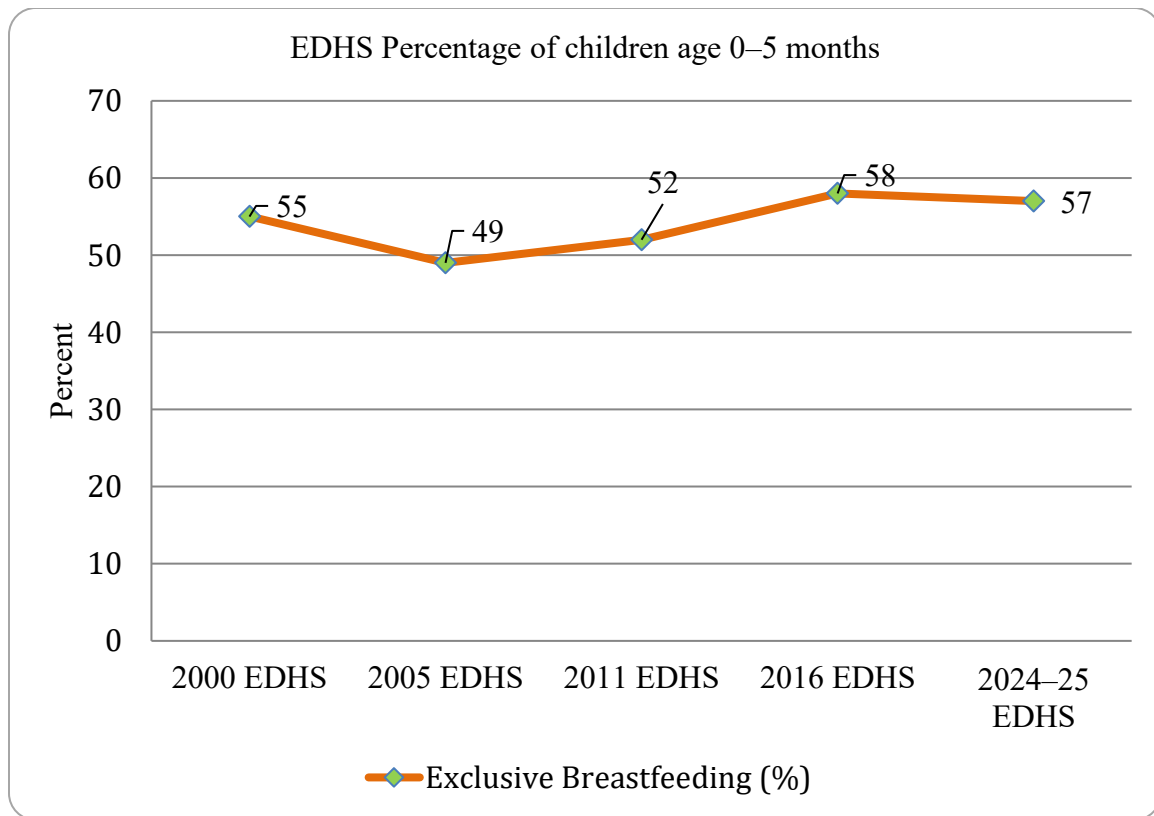
Despite measurable progress, undernutrition remains a major challenge. Stunting and wasting are still concentrated among children living in rural areas, poorer households, and regions experiencing food insecurity. Addressing these disparities requires coordinated policies across health, agriculture, education, and social protection sectors [18][19][20].

Exclusive Breastfeeding

Exclusive breastfeeding during the first six months of life is one of the most effective interventions for improving infant survival and health outcomes. The World Health Organization recommends that infants receive only breast milk for the first six months, followed by continued breastfeeding alongside complementary foods for up to two years or beyond. Figure 7 illustrates trends in exclusive breastfeeding in Ethiopia using data from successive rounds of the EDHS conducted between 2000 and 2025 [1–4].

Figure 7 indicates that exclusive breastfeeding rates in Ethiopia have remained relatively high compared with many other low- and middle-income countries. The proportion of infants exclusively breastfed increased from approximately 55 percent in 2000 to around 58 percent in 2016, with recent estimates indicating levels close to 57 percent. These figures demonstrate moderate improvement but also highlight that many Ethiopian infants are still introduced to other foods or liquids before the recommended six-month period [2][5][6].

Figure 7. Trends in Exclusive Breastfeeding



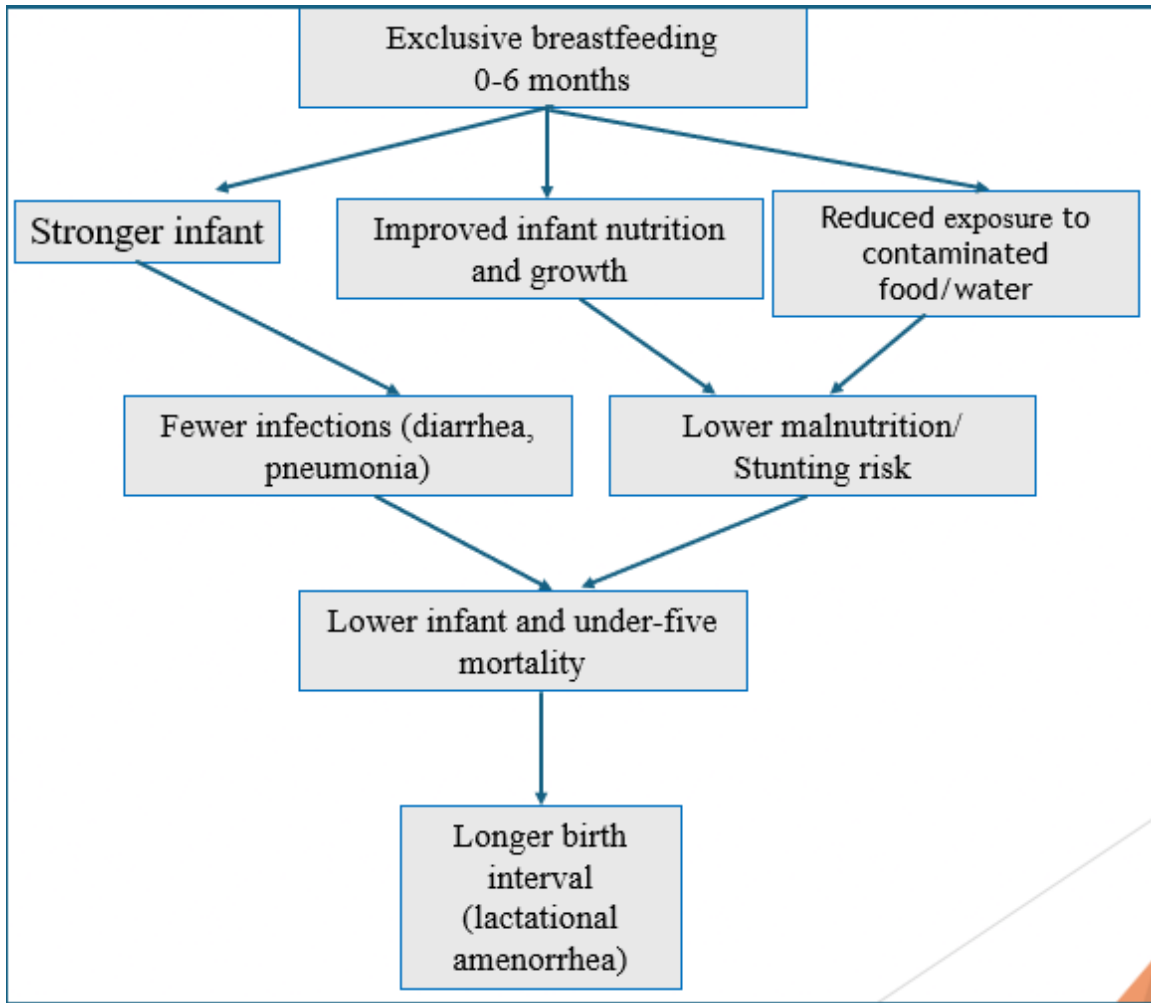
Public Health Importance: Exclusive breastfeeding provides optimal nutrition for infants and protects against infectious diseases such as diarrhea and pneumonia, which remain leading causes of child mortality in many developing countries. Breast milk contains essential antibodies, nutrients, and growth factors that promote healthy development while strengthening the infant immune system. Studies estimate that optimal breastfeeding practices could prevent hundreds of thousands of child deaths globally each year [3][7][8].

Drivers of Improvement: Several national initiatives have contributed to improvements in breastfeeding practices in Ethiopia. The HEP expanded community health services and strengthened maternal and child health education across rural communities. Health extension workers provide counseling on breastfeeding practices during antenatal care visits, postnatal care, and community outreach programs [9][10]. In addition, Ethiopia has implemented infant and young child feeding strategies aligned with global WHO and UNICEF guidelines, further promoting exclusive breastfeeding [11][12].

Remaining Challenges: Despite progress, exclusive breastfeeding rates remain below the global target of at least 70 percent coverage recommended by international health organizations. Barriers include limited maternal knowledge, early return to work, cultural feeding practices, and inconsistent access to postnatal counseling services. Urbanization

and changing lifestyles may also influence infant feeding practices in ways that reduce breastfeeding duration [13][14][15].

Figure 8: Exclusive breastfeeding impact pathway



The overall trend in Figure 7 demonstrates that Ethiopia has maintained relatively strong breastfeeding practices compared with many countries in sub-Saharan Africa. Nevertheless, sustaining and improving these gains will require continued investments in maternal health services, workplace policies supporting breastfeeding mothers, and community-based health education programs. Strengthening these interventions will be essential for achieving national nutrition goals and improving child survival outcomes [16–20].

Pregnancy-related Mortality Ratios (PRMR)

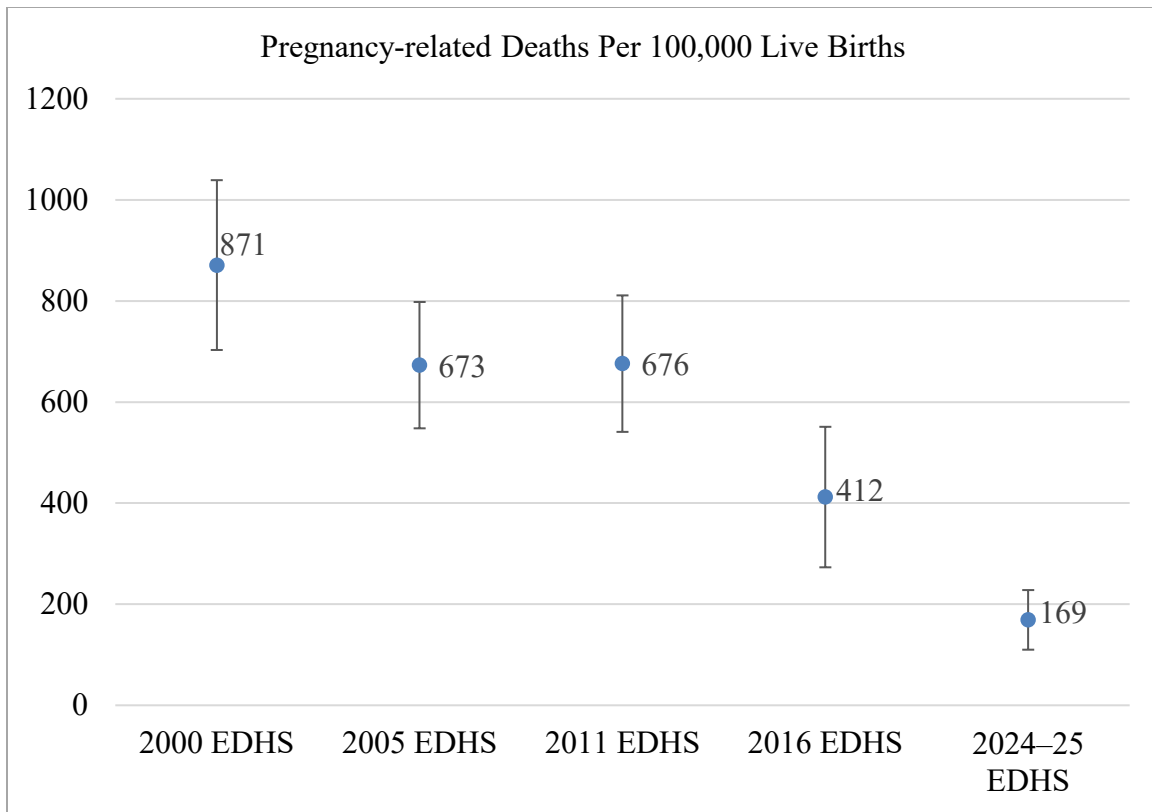
Pregnancy-related mortality remains one of the most widely used indicators of maternal health and health-system performance. The pregnancy-related mortality ratio (PRMR) measures deaths associated with pregnancy, childbirth, or the postpartum period per 100,000 live births. Figure 8 illustrates Ethiopia's PRMR trend using successive rounds of the EDHS. These nationally representative surveys show a substantial decline in maternal mortality over the past quarter century, reflecting improvements in maternal health services, community health programs, and health-system expansion across Ethiopia [1][2][3].

Long-Term Trends in PRMR: EDHS estimates (Figure 9) indicate that Ethiopia's pregnancy-related mortality ratio declined from approximately 871 deaths per 100,000 (95% CI.: 703, 1039) live births in 2000 to 673 in 2005 (95% CI.: 673, 789) and 676 in 2011 (95% CI.: 676, 810), then fell sharply to 412 (95% CI.: 273, 551) in 2016 and to roughly 169 (95% CI.: 169, 227) deaths per 100,000 live births in the most recent survey. This pattern indicates substantial progress in maternal health outcomes. Earlier surveys reflected limited access to skilled obstetric care and weak health infrastructure, while later improvements coincide with expanded health facilities, increased midwife training, and improved maternal health programs nationwide [4][5].

Global Context: International datasets produced by the World Health Organization, World Bank, and United Nations also confirm Ethiopia's progress in reducing maternal mortality over the past two decades. These estimates indicate that Ethiopia's maternal mortality ratio declined from nearly 950 deaths per 100,000 live births around 2000 to below 300 by 2020. Although this represents a major improvement, maternal mortality remains well above the Sustainable Development Goal target of fewer than 70 deaths per 100,000 live births by 2030, highlighting the need for continued policy attention and investment in maternal health services [6][7][8].

Drivers of Maternal Mortality Reduction: The HEP expanded primary health services to rural communities through trained health extension workers who provide maternal health education, antenatal care counseling, and referral services. This program increased awareness of pregnancy risks and encouraged facility-based delivery, thereby reducing maternal deaths [9][10]. Ethiopia also expanded skilled birth attendance and emergency obstetric care services by increasing the number of health facilities and trained midwives. Improved access to these services helped address leading causes of maternal mortality, including hemorrhage and hypertensive disorders [11][12].

Figure 9. Trends in Pregnancy-Related Mortality Ratio (PRMR)



Community Engagement and Health Systems: Community mobilization initiatives, such as the Women Development Army, strengthened connections between households and health facilities, improving service utilization and maternal health awareness. Through expanded community engagement and health system investments, Ethiopia achieved notable improvements in maternal health indicators over the past two decades [13].

Remaining Challenges: Despite considerable progress, maternal mortality remains a significant public health challenge. Persistent risk factors include delays in reaching health facilities, shortages of skilled health professionals in rural areas, and regional inequalities in health-service availability. Leading medical causes of maternal death include obstetric hemorrhage, hypertensive disorders, sepsis, obstructed labor, and complications associated with unsafe abortion [14][15][16].

The overall PRMR trend in Figure 9 reflects a major achievement in Ethiopia’s public health transformation since 2000. The decline in maternal mortality reveals expanded health services, improved access to skilled birth attendance, and stronger community health systems. Continued investment in maternal health and emergency obstetric care will be essential for achieving further reductions and meeting global health targets [6][13][16].

Discussion

The evidence presented across the eight indicators analyzed in this chapter demonstrates that Ethiopia has undergone a significant demographic and health transition over the past quarter-century. Improvements in reproductive health services, maternal care, and child health interventions have contributed to substantial gains in fertility reduction, maternal survival, and child survival. These trends are consistent with broader global patterns observed in countries that have expanded access to primary health care and community-based health programs [1][3][9].

The expansion of family planning services appears to have played a central role in Ethiopia's demographic transition. Increased access to modern contraceptive methods contributed to declining fertility and improved birth spacing, both of which are associated with reductions in maternal and child mortality [4][7][12]. The observed decline, therefore, reflects not only changes in reproductive preferences but also improvements in access to reproductive health services and women's education.

Similarly, improvements in child survival indicators are closely linked to expanded vaccination coverage, improved nutrition interventions, and relatively high exclusive breastfeeding rates. These interventions represent some of the most cost-effective strategies for reducing child mortality globally [8][10][14]. The substantial decline in under-five mortality observed in Ethiopia aligns with international evidence showing that investments in primary health care and preventive child health services can produce rapid improvements in survival outcomes.

The rapid increase in skilled birth attendance also reflects the impact of Ethiopia's health system reforms. Expanded health infrastructure, increased training of midwives and skilled birth attendants, and community-based referral systems contributed to higher utilization of facility-based deliveries. This expansion of maternal health services likely played an important role in the substantial decline in pregnancy-related mortality observed over the study period [11][13].

Despite these achievements, the findings also highlight persistent disparities in health outcomes. Rural areas and underserved regions continue to have lower access to health services and poorer health outcomes than urban populations. Addressing these disparities will be critical for sustaining progress and ensuring that improvements in demographic and health indicators benefit all population groups.

Ethiopia in Comparative African Perspective

Ethiopia's demographic and health trajectory over the past quarter century reflects broader patterns observed in many other African countries that have participated in repeated rounds of the EDHS. The availability of multiple nationally representative surveys since 2000 makes it possible to compare Ethiopia's progress with that of other countries with similarly long DHS series. Kenya, Rwanda, and Egypt provide useful comparative benchmarks because each country has conducted multiple DHS surveys between 2000 and the mid-2020s and has documented measurable improvements in reproductive health, maternal health, and child survival indicators.

Kenya's experience illustrates how sustained investments in reproductive health services and community health programs can contribute to a relatively rapid decline in fertility and improvements in maternal and child health outcomes. Kenya's DHS series shows steady increases in contraceptive prevalence, declines in fertility, and improvements in skilled birth attendance and child survival since the early 2000s. In several indicators, Kenya's improvements began earlier than Ethiopia's, reflecting earlier expansion of family planning programs and maternal health services. Nevertheless, Ethiopia's progress over the past fifteen years has narrowed many of these gaps, particularly in contraceptive use, reductions in child mortality, and maternal health service utilization [51][52].

Rwanda offers another instructive comparison. Following major health system reforms in the early 2000s, Rwanda implemented strong community health programs, expanded maternal and child health services, and improved health system accountability. These reforms were associated with rapid increases in modern contraceptive use, large reductions in child mortality, and significant improvements in maternal health indicators documented through successive DHS rounds. Ethiopia's Health Extension Program shares several similarities with Rwanda's community-based health system approach, demonstrating how community health workers can play a central role in delivering preventive services and strengthening maternal and child health outcomes [53][54].

Egypt provides a useful non-sub-Saharan comparator because its fertility transition began earlier and progressed more rapidly than in many African countries. Egypt's DHS series shows a sustained decline in fertility beginning in the 1980s and continuing through the early 2000s, supported by long-standing national family planning programs and relatively high levels of female education. Compared with Egypt, Ethiopia's fertility transition began later but has accelerated in recent decades as access to reproductive health services expanded and girls' education improved [55][56].

Nigeria, Africa's most populous country, illustrates the challenges of achieving similar demographic transitions in contexts characterized by large regional disparities and uneven access to health services. Despite repeated DHS surveys and national policy initiatives, progress in family planning uptake, maternal health service utilization, and child survival has been slower and more uneven across Nigeria's regions. The comparison highlights the importance of equitable expansion of the health system and sustained investment in community-based services—areas where Ethiopia has made notable progress through its primary health care reforms [57–59].

Taken together, these comparisons suggest that Ethiopia's demographic and health transition is consistent with patterns observed in other countries that have expanded access to reproductive health services, maternal health care, and child health interventions. While the pace and sequencing of improvements differ across countries, the underlying drivers—including female education, expanded primary health care, community health programs, and improved access to family planning—appear broadly similar. Ethiopia's experience, therefore, contributes to a growing body of evidence demonstrating how sustained investments in primary health care and community-based

health systems can produce substantial improvements in population health outcomes over time [60].

Prospects to 2050

A. Demographic Momentum and Population Growth

Ethiopia's demographic future will continue to be shaped by strong population momentum. Even as fertility declines, the large cohort of young people entering reproductive ages will sustain population growth for several decades. United Nations population projections indicate that Ethiopia's population could exceed 150 million by 2050 under medium-variant assumptions, positioning the country among the most populous nations globally. This growth reflects both past high fertility and ongoing improvements in child survival [61].

At the same time, declining fertility and increasing life expectancy suggest that Ethiopia is entering a transitional phase in which population growth will gradually slow. The pace of this transition will depend on continued improvements in access to family planning, female education, and economic opportunities for women.

B. Fertility Transition and Reproductive Health

Looking ahead, Ethiopia's fertility trajectory will be central to its demographic future. Continued expansion of modern contraceptive use and reductions in unmet need for family planning are expected to further lower total fertility rates. However, regional disparities in contraceptive access and persistent sociocultural barriers may slow progress in some areas.

Evidence from other DHS countries suggests that sustained investments in reproductive health services, combined with improvements in girls' education, can accelerate fertility decline. If Ethiopia continues on its current trajectory, fertility could approach replacement levels in urban areas while remaining higher in rural regions, leading to continued internal demographic diversity.

C. Maternal and Child Health: Toward Convergence

Ethiopia is likely to see continued improvements in maternal and child health outcomes, particularly if current trends in service utilization are sustained. Further reductions in child mortality will depend on closing gaps in immunization coverage, improving neonatal care, and addressing persistent nutritional challenges.

Maternal mortality is expected to decline as access to skilled birth attendance and emergency obstetric care expands. However, achieving levels observed in middle-income countries will require improvements in quality of care, referral systems, and health system capacity. Strengthening primary health care and integrating services across the continuum of care—from pregnancy through early childhood—will remain critical.

D. The Central Role of Women's Education and Empowerment

Perhaps the most important determinant of Ethiopia's demographic and health future is the continued expansion of women's education and empowerment. Increased educational attainment among girls is strongly associated with delayed marriage, reduced fertility, improved maternal health care utilization, and better child health outcomes.

As highlighted in earlier sections of this chapter, women's education functions as a cross-cutting driver of demographic transition. Investments in girls' secondary education, labor force participation, and reproductive autonomy will have multiplier effects across all eight indicators examined in this study. These investments are likely to shape not only demographic outcomes but also broader economic and social development trajectories.

E. Nutrition and Early Childhood Development

Despite progress, childhood undernutrition remains a key constraint on Ethiopia's human capital development. Future gains in child survival must be accompanied by improvements in nutritional status, particularly reductions in stunting and micronutrient deficiencies.

Exclusive breastfeeding, improved complementary feeding practices, and expanded access to nutrition-sensitive interventions will be essential for ensuring that gains in survival translate into long-term developmental outcomes.

F. Health Systems and Policy Implications

Ethiopia's future progress will depend on the continued evolution of its health system. The Health Extension Program has demonstrated the effectiveness of community-based service delivery, but future gains will require strengthening quality of care, integrating services, and addressing emerging health challenges.

Urbanization, changing disease patterns, and increasing demand for higher-quality care will require adaptive health system strategies. Investments in data systems, workforce development, and health equity will be essential for sustaining progress.

Taken together, these trends suggest that Ethiopia's demographic and health transition is likely to continue over the coming decades, shaped by the interaction of population dynamics, health system development, and broader social determinants of health.

Conclusion

Over the past twenty-five years Ethiopia has experienced substantial improvements in key demographic and health indicators. Evidence from successive rounds of the Ethiopia Demographic and Health Survey demonstrates measurable progress in family planning utilization, fertility reduction, maternal health service coverage, child survival, and improvements in childhood nutrition.

These improvements reflect the cumulative impact of sustained health system reforms, particularly the expansion of primary health care and community-based services through Ethiopia's Health Extension Program. Expanded access to reproductive health services, increased skilled birth attendance, improved immunization coverage, and strengthened maternal and child health programs have collectively contributed to substantial gains in population health.

Comparisons with other DHS countries demonstrate that Ethiopia's experience is broadly consistent with patterns observed in settings where sustained investments in primary health care and community health systems have been implemented. While the pace of change differs across countries, the underlying drivers—including women's education, improved access to reproductive health services, and expanded primary health care—appear remarkably similar.

Important challenges remain, including regional disparities, rural-urban inequalities, and persistent childhood undernutrition. Addressing these challenges will require continued investment in health systems as well as broader social determinants of health, including women's education, economic opportunities, and improved nutrition programs.

Ethiopia's demographic and health transition, therefore, illustrates a central lesson of population health: when sustained public policy commitment, scientific evidence, and community-based health systems work together, even countries facing complex demographic and health challenges can achieve remarkable improvements in population well-being.

Recommendations for Sustaining Positive Demographic and Health Trends in Ethiopia

1. Strengthen Primary Health Care Systems

Ethiopia's remarkable gains in child survival, maternal health, immunization, and reproductive health over the past quarter century have been built largely upon the foundation of an expanding primary health care system. Continued investment in this system will be essential not only to preserve these achievements but also to address emerging challenges associated with population growth, urbanization, epidemiological transition, and rising expectations for quality care.

Priority should be given to strengthening the full continuum of care—from community outreach and preventive services to health centers, primary hospitals, and referral facilities. Investments should focus not only on expanding physical infrastructure but also on improving service quality, workforce capacity, supply chain reliability, health information systems, and accountability mechanisms. Particular attention should be paid to underserved rural communities, pastoralist areas, and rapidly growing urban settlements where access and quality gaps remain pronounced.

Looking toward 2050, Ethiopia's demographic profile will continue to evolve. The health system must therefore prepare not only for ongoing maternal and child health needs but also for a growing burden of non-communicable diseases, injuries, mental health conditions, and the health consequences of climate-related shocks. Building a resilient primary health care system today will enable the country to manage these future demands more effectively and equitably.

A strengthened primary health care system should be viewed not merely as a health sector investment but as a national development strategy. Sustaining and accelerating Ethiopia's demographic and health gains over the coming decades will depend fundamentally on the strength, accessibility, and quality of its primary health care system.

Policy Actions

- Continue expanding and upgrading health centers and primary hospitals, particularly in underserved regions.
- Strengthen referral systems and emergency transportation networks.
- Improve quality of care through workforce training, supervision, and performance monitoring.
- Modernize health information systems to support timely decision-making and accountability.
- Prioritize equitable access for rural, pastoralist, and disadvantaged populations.
- Prepare primary health care systems to address emerging burdens including non-communicable diseases, mental health, injuries, and climate-related health threats.
- Increase domestic financing and long-term sustainability of primary health care investments.

This recommendation serves as the foundation upon which many of the remaining recommendations rest, as sustained progress in fertility, family planning, maternal health, child survival, nutrition, immunization, and other indicators ultimately depends on a strong and resilient primary health care system.

2. Expand and Modernize Community Health Programs

One of the most important contributors to Ethiopia's remarkable improvements in maternal and child health over the past quarter century has been the Health Extension Program (HEP). Since its introduction, the program has brought essential health services closer to communities, expanded health promotion activities, increased utilization of preventive services, and strengthened the connection between households and the formal health system. Few public health initiatives have had a broader or more sustained impact on population health in Ethiopia.

As Ethiopia looks toward 2050, the role of community health programs should evolve from a primarily service-delivery model to a more comprehensive platform for health promotion, disease prevention, surveillance, behavior change, and community resilience. While major gains have been achieved, significant disparities persist across regions,

particularly in rural, pastoralist, and geographically isolated communities where access to health facilities remains limited. Community-based programs will continue to be essential for reaching these populations and ensuring that progress is shared equitably.

Future investments should focus on strengthening the capacity, effectiveness, and sustainability of the Health Extension Program. This includes improving recruitment, training, supervision, career development, retention, and motivation of HEWs. As health challenges become increasingly complex, HEWs will require enhanced skills not only in maternal and child health, but also in nutrition, adolescent health, mental health, non-communicable diseases, climate-related health risks, and digital health technologies.

Supply chain reliability must also be strengthened. The effectiveness of community health workers depends heavily on consistent access to essential medicines, vaccines, diagnostic tools, educational materials, and communication technologies. Supply disruptions can quickly undermine community confidence and reduce program effectiveness.

The next generation of community health programs should also leverage advances in digital technology. Mobile devices, electronic reporting systems, teleconsultation, decision-support tools, and real-time data collection can improve service quality, strengthen supervision, and enhance responsiveness to local health needs. Such technologies can also help transform community-level data into actionable intelligence for district, regional, and national decision-makers.

Community health programs will remain particularly important for addressing behaviors and practices that cannot be changed through facility-based care alone. Areas such as exclusive breastfeeding, child nutrition, vaccination uptake, sanitation and hygiene, family planning, maternal health care utilization, and early childhood development all require sustained engagement at the household and community levels. The Health Extension Program is uniquely positioned to support these efforts.

Looking ahead, Ethiopia should view community health programs not merely as extensions of the health sector, but as strategic investments in human development. Strong community health systems can improve health outcomes, reduce inequalities, strengthen resilience during emergencies, and accelerate progress toward universal health coverage.

Policy Actions

- Expand and strengthen the Health Extension Program, particularly in underserved rural, pastoralist, and rapidly growing peri-urban communities.
- Enhance training curricula to include nutrition, exclusive breastfeeding support, adolescent health, mental health, non-communicable diseases, climate resilience, and digital health competencies.
- Improve supervision, mentorship, career progression, and retention strategies for Health Extension Workers.

- Strengthen supply chains to ensure uninterrupted availability of essential medicines, vaccines, diagnostic tools, and educational materials.
- Equip HEWs with mobile technologies for data collection, reporting, decision support, and communication.
- Increase community engagement through partnerships with local leaders, schools, women's groups, youth organizations, and faith-based institutions.
- Use community health platforms to strengthen behavior-change interventions related to breastfeeding, child nutrition, immunization, reproductive health, and healthy lifestyles.
- Enhance community-based disease surveillance and emergency preparedness capacities.
- Develop tailored service delivery models for pastoralist and hard-to-reach populations.
- Strengthen integration between community-level services and health facilities to improve continuity of care and referral systems.

Community health programs have been among Ethiopia's most effective public health investments. Continued modernization and expansion of these programs will be essential for sustaining gains achieved over the past 25 years and extending them to all communities by 2050.

3. Improve Maternal Health Services

Few indicators better reflect the overall performance of a health system than maternal mortality and maternal health outcomes. Ethiopia has made substantial progress over the past quarter century, achieving significant reductions in maternal mortality and notable increases in skilled birth attendance, antenatal care utilization, and facility-based deliveries. These achievements represent one of the country's most important public health successes. Nevertheless, maternal mortality remains unacceptably high, and major disparities persist across regions, socioeconomic groups, and urban-rural populations.

Further reductions in maternal mortality will require a renewed focus on both **access and quality of care**. While expanding service coverage in underserved areas remains important, greater attention must be given to the quality, timeliness, and continuity of maternal health services. Women must have access to comprehensive care throughout the entire continuum—from preconception and pregnancy through childbirth and the postpartum period.

A particular priority is strengthening access to **emergency obstetric and newborn care (EmONC)**. Many maternal deaths continue to result from preventable complications such as hemorrhage, hypertensive disorders, sepsis, obstructed labor, and unsafe abortion. Timely recognition and treatment of these complications depend upon functional referral systems, adequately staffed facilities, reliable transportation networks, and availability of essential medicines, blood products, and surgical capacity.

Expanding and improving the maternal health workforce will remain critical. Midwives, nurses, obstetricians, anesthetists, and other skilled birth attendants are the backbone of safe motherhood programs. Continued investments in pre-service education, in-service training, mentoring, supportive supervision, and retention—particularly in rural and remote areas—are essential. Special attention should be paid to improving deployment and retention strategies in historically underserved regions where workforce shortages remain acute.

The postpartum period deserves particular emphasis. Historically, maternal health programs have focused heavily on pregnancy and delivery, while postnatal care has received comparatively less attention. Yet many maternal and newborn deaths occur during the days and weeks immediately following childbirth. Strengthening postnatal care can improve maternal survival, support exclusive breastfeeding, increase family planning uptake, identify postpartum complications early, and improve newborn health outcomes.

Looking toward 2050, Ethiopia's maternal health agenda should also evolve to address changing demographic and epidemiological realities. As fertility continues to decline and urbanization accelerates, maternal health programs will increasingly need to address chronic conditions such as hypertension, diabetes, obesity, and mental health disorders that complicate pregnancy and childbirth. Climate-related emergencies, displacement, and humanitarian crises may also place additional pressures on maternal health services.

Improving maternal health should not be viewed solely as a health-sector objective. Maternal health is closely linked to women's education, economic opportunity, gender equality, transportation infrastructure, nutrition, and broader social development. Investments that empower women and improve their social and economic status often yield substantial maternal health benefits.

By 2050, Ethiopia should aspire not merely to reduce maternal mortality further, but to ensure that every woman—regardless of geography, income, education, or social status—has access to safe, respectful, and high-quality maternal health care throughout the reproductive life course.

Policy Actions

- Expand access to comprehensive emergency obstetric and newborn care (EmONC) services nationwide.
- Strengthen referral systems, ambulance networks, and emergency transportation infrastructure, particularly in rural and pastoralist areas.
- Increase the number, distribution, and retention of skilled birth attendants, including midwives and obstetric care providers.
- Invest in continuous professional development, mentoring, and supportive supervision for maternal health workers.
- Improve the quality of antenatal care through enhanced screening, risk assessment, counseling, and continuity of care.

- Strengthen postnatal care services, including early postpartum follow-up visits for both mothers and newborns.
- Ensure reliable availability of essential medicines, blood products, surgical services, and lifesaving equipment.
- Expand access to maternal health services in humanitarian, conflict-affected, and climate-vulnerable settings.
- Integrate maternal health services with nutrition, family planning, breastfeeding support, mental health, and newborn care programs.
- Utilize digital health technologies to improve referral coordination, patient tracking, and service quality monitoring.
- Strengthen maternal death surveillance and response systems to identify systemic weaknesses and guide quality improvement efforts.
- Address social determinants of maternal health through investments in women's education, transportation, nutrition, and economic empowerment.

Maternal health improvements have been one of Ethiopia's greatest public health achievements since 2000. Sustaining and accelerating this progress will require a shift from expanding coverage alone to ensuring that all women receive high-quality, timely, and equitable care throughout pregnancy, childbirth, and the postpartum period. Such investments will generate benefits not only for mothers but also for newborns, families, communities, and future generations.

4. Address Nutritional Inequalities

Ethiopia has made meaningful progress in improving child nutrition over the past quarter century, particularly through reductions in chronic undernutrition (stunting) and improvements in child survival. Nevertheless, undernutrition remains one of the country's most persistent public health and development challenges. Despite progress, millions of Ethiopian children continue to experience stunting, wasting, underweight, and micronutrient deficiencies, with substantial disparities across regions, income groups, educational levels, and urban-rural populations.

The experience of the past 25 years demonstrates that nutritional improvements do not occur solely through health-sector interventions. Nutrition outcomes are shaped by a complex interaction of food security, maternal health, women's education, sanitation, water access, poverty, agricultural productivity, household decision-making, and broader social conditions. As a result, future gains will require a truly multisectoral approach that extends beyond traditional nutrition programs.

A particularly important lesson from both Ethiopia and international experience is that **stunting is not merely a nutrition problem—it is a development problem**. Chronic undernutrition often begins before birth and reflects cumulative disadvantages experienced by mothers and children. Poor maternal nutrition, adolescent pregnancy, inadequate birth spacing, repeated infections, food insecurity, low educational attainment, and limited access to sanitation all contribute to impaired growth and development.

Addressing these interconnected factors requires coordinated action across multiple sectors.

The first 1,000 days—from conception through a child's second birthday—remain the most critical window for intervention. Nutritional deficits acquired during this period can have lifelong consequences for physical growth, cognitive development, educational attainment, economic productivity, and health outcomes. Investments during this window generate some of the highest returns available in public policy.

Maternal nutrition deserves particular attention. The nutritional status of mothers directly influences birth outcomes, child growth, and long-term developmental trajectories. Improving maternal nutrition before conception, during pregnancy, and throughout breastfeeding can yield substantial benefits for both women and children. This reinforces the importance of integrating nutrition interventions into maternal and reproductive health services.

The analysis of women's education presented elsewhere in this report highlights another important pathway. Women with higher levels of education tend to have better access to information, improved health-seeking behaviors, enhanced decision-making capacity, and greater economic opportunities. Consequently, investments in girls' and women's education can produce long-term nutritional benefits that extend across generations.

Exclusive breastfeeding also occupies a central place in Ethiopia's nutrition agenda. As discussed in the dedicated EBF analysis, breastfeeding is one of the most effective and affordable interventions for improving child nutrition and survival. Increasing exclusive breastfeeding rates from current levels toward WHO targets is one of Ethiopia's most immediate opportunities to accelerate nutritional gains.

Looking toward 2050, Ethiopia's nutrition strategy must also adapt to emerging challenges. Rapid urbanization, dietary transitions, climate change, food system disruptions, and changing disease patterns are likely to create new forms of nutritional vulnerability. While undernutrition will remain a concern in many communities, overweight, obesity, and diet-related non-communicable diseases may become increasingly important in urban populations. Future policies should therefore promote healthy diets across the entire life course while maintaining a strong focus on vulnerable populations.

Ultimately, reducing nutritional inequalities is not only about improving health outcomes. It is also an investment in human capital, educational achievement, labor productivity, economic growth, and national development. Few interventions offer greater potential to improve both individual well-being and societal prosperity.

Policy Actions

- Prioritize the first 1,000 days through integrated maternal, infant, and young child nutrition programs.

- Strengthen maternal nutrition interventions before conception, during pregnancy, and throughout breastfeeding.
- Scale up promotion and support for exclusive breastfeeding and appropriate complementary feeding practices.
- Expand community-based management of acute malnutrition and strengthen referral systems for severe cases.
- Improve household food security through coordinated agriculture, nutrition, and social protection programs.
- Strengthen school feeding programs and nutrition-sensitive education initiatives.
- Increase access to safe drinking water, sanitation, and hygiene (WASH) services to reduce infection-related growth faltering.
- Expand micronutrient supplementation and food fortification programs, particularly for women and young children.
- Target nutrition interventions toward regions and populations experiencing the highest burdens of undernutrition.
- Strengthen nutrition surveillance systems to identify emerging disparities and monitor progress.
- Promote girls' and women's education as a long-term strategy for improving household nutrition and child wellbeing.
- Develop climate-resilient food systems capable of withstanding droughts, floods, and other environmental shocks.
- Prepare for emerging nutrition challenges associated with urbanization and dietary transition, including overweight and obesity.

Reducing nutritional inequalities represents one of Ethiopia's greatest opportunities for accelerating progress in health, education, and economic development. Sustained improvements will require coordinated action across sectors, sustained political commitment, and continued investment in both immediate nutrition interventions and the broader social determinants that shape nutritional outcomes. By doing so, Ethiopia can build on the gains of the past quarter century and move toward a future in which every child has the opportunity to achieve his or her full growth and developmental potential.

5. Expand Immunization Coverage

Immunization has been one of the most successful public health interventions in Ethiopia's modern history. Over the past quarter century, the country has achieved substantial improvements in childhood vaccination coverage, contributing significantly to reductions in infant and child mortality. Vaccines have helped protect millions of Ethiopian children from preventable diseases such as measles, polio, diphtheria, pertussis, tetanus, and tuberculosis, making immunization one of the highest-return investments in public health.

Despite these achievements, important challenges remain. Coverage levels for individual vaccines and full immunization continue to vary across regions, socioeconomic groups, and place of residence. A significant number of children still fail to receive all recommended vaccinations, while a smaller but important group remains entirely

unvaccinated ("zero-dose" children). These gaps represent both a public health concern and an equity challenge.

The broader demographic trends documented in this report provide reason for optimism. Ethiopia's continuing fertility decline—illustrated by the reduction in total fertility from 5.5 children per woman in 2000 to 4.0 in the 2024–25 EDHS—creates an opportunity to improve child health services, including immunization. As family sizes gradually decrease, households may be better positioned to seek preventive services for each child, while health systems may be able to devote greater attention and resources to ensuring complete vaccination coverage. However, these potential gains are not automatic and will require deliberate investments and effective service delivery.

A major priority should be reaching children who are consistently missed by routine immunization systems. Many of these children live in remote rural communities, pastoralist populations, conflict-affected areas, informal urban settlements, or among highly mobile populations. These groups often face multiple barriers, including distance to health facilities, transportation challenges, supply interruptions, lack of awareness, competing household priorities, and occasional vaccine hesitancy.

Strengthening vaccine supply chains and cold-chain systems remains essential. Even highly motivated families cannot vaccinate their children if vaccines are unavailable or improperly stored. Investments in cold-chain infrastructure, solar-powered refrigeration, transportation systems, inventory management, and real-time monitoring can substantially improve service reliability and public confidence.

Community engagement will also be critical. Ethiopia's Health Extension Program has demonstrated the value of trusted community-based health promotion. Health Extension Workers, community volunteers, religious leaders, teachers, and local organizations can help identify unvaccinated children, address misconceptions, and encourage completion of vaccination schedules.

Looking toward 2050, immunization programs must adapt to a changing Ethiopia. Urbanization, migration, climate-related displacement, humanitarian emergencies, and evolving disease threats will require increasingly flexible and resilient vaccination systems. Advances in digital technologies offer opportunities to improve vaccine tracking, reminder systems, geographic targeting, and performance monitoring.

Immunization should also be viewed as part of a broader child health strategy. Vaccination services provide opportunities to connect families with nutrition counseling, growth monitoring, breastfeeding support, sanitation education, and other essential child health services. Integrating these services can improve efficiency and maximize health benefits.

By 2050, Ethiopia should aspire not only to increase overall vaccination coverage but also to eliminate major geographic and socioeconomic disparities in immunization access. The ultimate goal should be ensuring that every child—regardless of birthplace,

income, ethnicity, or residence—receives the full protection that modern vaccines can provide.

Policy Actions

- Strengthen routine immunization systems and prioritize completion of the full vaccination schedule.
- Identify and target zero-dose and under-vaccinated children through community outreach and microplanning.
- Expand cold-chain infrastructure, including solar-powered refrigeration in remote areas.
- Improve vaccine forecasting, procurement, inventory management, and distribution systems.
- Utilize digital technologies for vaccine registries, reminder systems, and performance monitoring.
- Strengthen immunization services in pastoralist, conflict-affected, and hard-to-reach communities.
- Enhance community engagement through Health Extension Workers, schools, religious institutions, and local leaders.
- Integrate immunization services with maternal and child health programs, nutrition services, and growth monitoring.
- Strengthen disease surveillance systems to rapidly detect and respond to vaccine-preventable disease outbreaks.
- Address vaccine hesitancy through culturally appropriate communication and community education.
- Ensure sustainable domestic financing for immunization programs while maintaining strategic partnerships with international agencies.
- Monitor and reduce regional, socioeconomic, and urban-rural disparities in vaccination coverage.

Immunization has been a cornerstone of Ethiopia's child survival success story. Continued investments in vaccine delivery systems, community outreach, and equitable access can help ensure that future generations benefit from one of the most effective and cost-efficient public health interventions ever developed. As Ethiopia's demographic transition continues and family sizes gradually decline, the country has a unique opportunity to move closer to universal immunization coverage and further reduce preventable childhood illness and death.

6. Support Women's Education and Empowerment (see Appendix 1 also)

Among all the factors examined in this retrospective review, few have greater potential to influence Ethiopia's future demographic and health trajectory than women's education and empowerment. While many health interventions target specific diseases, conditions, or stages of life, women's education functions as a foundational societal investment that shapes outcomes across multiple domains simultaneously. Its influence extends beyond

the education sector into fertility, reproductive health, child survival, nutrition, economic productivity, gender equality, and national development.

The analysis presented in this report demonstrates that women's education should be viewed not merely as a social objective but as a long-term public health intervention. Unlike many health programs that require continuous service delivery and recurring expenditures, investments in girls' education generate benefits that accumulate and compound over decades, often across multiple generations.

Ethiopia's demographic transition over the past quarter century has unfolded alongside substantial improvements in educational access. Expanded educational opportunities for girls have contributed to delayed marriage, lower fertility, increased contraceptive use, improved maternal health care utilization, and better child health outcomes. These relationships are well established globally and are increasingly evident within Ethiopia's own experience.

One of the strongest pathways through which education influences demographic change is fertility reduction. Women with higher educational attainment tend to marry later, have greater knowledge of reproductive health, desire smaller families, and are more likely to use family planning services effectively. As a result, increases in educational attainment often precede declines in fertility and contribute to slower population growth. In Ethiopia's context, continued expansion of girls' education may be among the most important drivers of future fertility decline and demographic transition.

The benefits extend far beyond fertility. Educated women are generally better equipped to navigate health systems, understand health information, advocate for themselves and their families, and make informed decisions regarding pregnancy, childbirth, infant feeding, nutrition, and disease prevention. These capabilities contribute directly to improvements in maternal survival, childhood immunization, nutritional status, and overall family wellbeing.

Women's education also emerged in this study as a strongly spatial phenomenon. The cluster-level analysis revealed substantial geographic variation in educational attainment across Ethiopia. Hot-spot analysis demonstrated statistically significant concentrations of both educational advantage and educational deprivation. These findings suggest that educational inequalities are not randomly distributed but are embedded within broader social, economic, cultural, and geographic systems. Consequently, interventions must be geographically targeted rather than relying solely on national-level strategies.

Education is also closely linked to economic empowerment. Women who complete secondary and higher education generally experience greater labor force participation, higher earnings, improved financial independence, and stronger bargaining power within households and communities. These economic benefits often translate into improved health investments for children, better nutrition, increased school attendance, and greater resilience to economic shocks.

The intergenerational effects may be even more important. Children of educated mothers consistently demonstrate higher school enrollment, better educational attainment, improved nutritional status, lower mortality, and enhanced developmental outcomes. These benefits accumulate across generations, creating a virtuous cycle of human capital development. In this sense, investments in girls' education may represent one of the most effective strategies available for improving Ethiopia's long-term development prospects.

Looking toward 2050, women's education will likely become even more important as Ethiopia navigates rapid urbanization, technological change, labor market transformation, and increasing global economic integration. The skills required in future economies will place a premium on educational attainment, particularly among women and girls. Expanding educational opportunities today will help ensure that Ethiopia's future workforce is healthier, more productive, and better prepared to compete in a rapidly changing world.

Women's empowerment should also extend beyond formal schooling. Empowerment includes access to economic opportunities, leadership roles, political participation, property rights, financial services, digital technologies, and decision-making authority within households and communities. Educational investments should therefore be complemented by broader efforts to strengthen gender equality and women's agency.

Ultimately, Ethiopia's experience suggests that women's education is not simply one determinant among many. It is a foundational force that influences nearly every demographic and health outcome examined in this report. If exclusive breastfeeding represents one of Ethiopia's most promising near-term opportunities for accelerated progress, women's education may represent its most important long-term investment.

Policy Actions

Expand Educational Access

- Achieve universal completion of primary education for girls.
- Accelerate expansion of secondary education, particularly in underserved regions.
- Increase opportunities for tertiary, technical, and vocational education for women.
- Improve educational access in rural, pastoralist, and hard-to-reach communities.

Reduce Barriers to School Attendance

- Address school-related costs that discourage girls' enrollment and retention.
- Expand safe transportation and boarding options where appropriate.
- Improve school sanitation facilities, particularly menstrual hygiene management.
- Reduce gender-based violence and safety concerns within and around schools.

Delay Early Marriage and Childbearing

- Strengthen enforcement of laws prohibiting child marriage.
- Expand adolescent reproductive health education and services.
- Support community-based initiatives that encourage girls to remain in school.
- Engage religious and community leaders in efforts to delay marriage.

Promote Women's Economic Empowerment

- Expand vocational training and entrepreneurship opportunities.
- Improve access to credit, savings programs, and financial literacy.
- Increase women's participation in formal labor markets.
- Support equal employment opportunities and workplace protections.

Strengthen Women's Leadership and Agency

- Promote women's participation in local and national decision-making bodies.
- Increase representation of women in education, health, business, and government leadership positions.
- Strengthen legal protections related to inheritance, property ownership, and economic rights.

Target Educational Hot Spots and Cold Spots

- Use geographic analyses to identify areas of persistent educational disadvantage.
- Prioritize investments in regions and communities with the highest concentrations of low educational attainment.
- Monitor educational inequalities alongside national averages.

Integrate Education and Health Policies

- Strengthen collaboration between the education and health sectors.
- Incorporate nutrition, reproductive health, breastfeeding, and health literacy into school curricula.
- Utilize schools as platforms for promoting healthy behaviors and lifelong wellbeing.

Looking Ahead to 2050

If Ethiopia succeeds in substantially increasing girls' educational attainment over the coming decades, the country is likely to experience benefits that extend far beyond the education sector. Lower fertility, improved maternal and child health, reduced poverty, increased economic productivity, stronger human capital, and greater social stability could all emerge as downstream consequences. Few investments offer such broad and

enduring returns. For this reason, women's education and empowerment should be viewed not as a supporting recommendation, but as one of the central pillars of Ethiopia's demographic, health, and development strategy for the first half of the twenty-first century.

7. Reduce Regional and Socioeconomic Disparities

One of the most important findings emerging from Ethiopia's demographic and health experience over the past quarter century is that national progress has not been distributed evenly across all regions and population groups. While national averages show substantial improvements in fertility, family planning, child survival, maternal health, immunization, nutrition, and other indicators, these averages often mask persistent disparities between regions, urban and rural populations, wealth groups, and educational strata.

The analyses presented throughout this report consistently demonstrate that geography continues to play a powerful role in shaping health outcomes. Significant differences remain among Ethiopia's regions in fertility levels, contraceptive use, maternal health service utilization, childhood nutrition, immunization coverage, exclusive breastfeeding, and women's educational attainment. Some regions have experienced rapid progress and now approach levels observed in middle-income countries, while others continue to face challenges characteristic of much earlier stages of demographic and health transition.

Particularly noteworthy are the disparities affecting pastoralist communities, remote rural populations, and geographically isolated areas. These communities often face structural barriers that extend beyond the health sector itself, including long travel distances, transportation constraints, limited infrastructure, lower educational attainment, periodic food insecurity, climate-related vulnerabilities, and shortages of skilled health personnel. Conventional facility-based service delivery models may be less effective in such settings, necessitating more flexible, context-specific approaches.

The persistence of regional disparities should not be viewed simply as a matter of unequal service coverage. Rather, these disparities often reflect broader differences in economic development, educational opportunities, infrastructure, governance capacity, social norms, environmental conditions, and historical investment patterns. Consequently, efforts to reduce inequalities must address both immediate health system constraints and the underlying social determinants that shape health outcomes.

The women's education analysis conducted as part of this project provides an important illustration. Spatial clustering analyses revealed statistically significant concentrations of educational advantage and disadvantage, suggesting that inequalities are often embedded within localized systems rather than randomly distributed across the country. Similar patterns are evident in many demographic and health indicators. This finding highlights the importance of geographic targeting and place-based interventions.

As Ethiopia continues its demographic transition, reducing disparities may become increasingly important than improving national averages alone. Countries that achieve the greatest long-term health gains often do so not merely by raising average performance, but by narrowing gaps between advantaged and disadvantaged populations. In many cases, future national progress will depend heavily on improvements among populations that have historically been left behind.

Urbanization presents both opportunities and challenges in this regard. Urban residents generally enjoy better access to health services, education, and economic opportunities than rural residents. However, rapid urban growth can also create new forms of inequality, particularly among residents of informal settlements and peri-urban communities. Policies must therefore address both traditional rural disadvantages and emerging urban vulnerabilities.

Climate change and environmental pressures may further exacerbate existing inequalities. Droughts, floods, food insecurity, displacement, and resource competition often disproportionately affect already vulnerable populations. Building resilience among disadvantaged communities will therefore become increasingly important as Ethiopia looks toward 2050.

Reducing disparities is not only a matter of fairness and social justice. It is also a practical strategy for accelerating national progress. The greatest opportunities for future improvements in health and demographic outcomes are increasingly concentrated among populations that have not yet fully benefited from the gains achieved elsewhere. By focusing on these populations, Ethiopia can simultaneously improve equity and accelerate overall development.

Policy Actions

Strengthen Geographic Targeting

- Use DHS, census, administrative, and geospatial data to identify high-priority regions and districts.
- Develop targeted investment strategies for areas experiencing persistent demographic and health disadvantages.
- Monitor progress through disaggregated indicators rather than relying solely on national averages.

Expand Services in Underserved Areas

- Increase investments in health facilities, schools, roads, and communications infrastructure in remote regions.
- Improve recruitment, deployment, and retention of health professionals in underserved communities.
- Expand access to maternal health, family planning, immunization, nutrition, and child health services.

Develop Tailored Approaches for Pastoralist Communities

- Expand mobile health services and outreach programs.
- Strengthen cross-sector coordination among health, education, water, and agriculture sectors.
- Develop service delivery models adapted to mobile populations and seasonal migration patterns.

Address Socioeconomic Barriers

- Expand social protection programs for vulnerable households.
- Reduce financial barriers to accessing health and education services.
- Strengthen poverty-reduction initiatives in disadvantaged regions.

Improve Data-Driven Decision Making

- Enhance subnational monitoring systems.
- Utilize geospatial analyses, hot-spot mapping, and equity-focused indicators to guide resource allocation.
- Institutionalize routine disparity assessments across major health and development programs.

Strengthen Community Engagement

- Involve local leaders, community organizations, women's groups, and youth groups in program design and implementation.
- Support culturally appropriate interventions that reflect local needs and priorities.

Build Climate and Emergency Resilience

- Strengthen services in drought-prone and climate-vulnerable areas.
- Improve preparedness for displacement, food insecurity, and humanitarian emergencies.
- Integrate resilience planning into health and development programs.

Looking Ahead to 2050

Ethiopia's future demographic and health success will increasingly depend on its ability to narrow persistent regional and socioeconomic gaps. The greatest opportunities for improvement may no longer lie in populations that have already experienced substantial gains, but among communities that continue to face structural disadvantages. By prioritizing equity-focused, geographically targeted, and multisectoral strategies, Ethiopia can ensure that the benefits of development reach all regions and populations. In doing so, the country can move beyond national averages toward a future in which progress is measured not only by how far Ethiopia advances, but also by how broadly those advances are shared.

8. Institutionalize Health Equity as a National Development Principle

Over the past quarter-century, Ethiopia has achieved remarkable progress in demographic and health outcomes. However, one of the clearest findings emerging from this review is that progress has not been experienced equally across all regions, populations, and communities. Significant disparities remain in fertility, family planning, maternal health, child survival, immunization, nutrition, exclusive breastfeeding, and women's education. These disparities suggest that Ethiopia's next phase of development should focus not only on improving national averages but also on ensuring that the benefits of progress are shared equitably.

Health equity refers to the principle that every individual should have a fair and just opportunity to attain their highest possible level of health. Achieving health equity requires identifying and addressing avoidable differences arising from social, economic, geographic, educational, environmental, and structural conditions. Equity is therefore not a separate program but a lens through which all policies and investments should be viewed.

Many of the disparities observed in this report originate outside the health sector. Access to education, transportation infrastructure, safe water, sanitation, food security, economic opportunity, and social protection all influence health outcomes. As a result, reducing inequities requires coordinated action across multiple sectors and levels of government. The health sector alone cannot eliminate disparities that originate in broader social and economic systems.

As Ethiopia continues its demographic transition, an equity-focused approach can help ensure that future progress reaches populations that have historically benefited least from development investments. Such populations may include residents of remote rural areas, pastoralist communities, urban informal settlements, low-income households, women with limited educational attainment, persons with disabilities, and populations affected by conflict, displacement, or environmental shocks.

The cluster-level and spatial analyses conducted for this report demonstrate that disadvantage often occurs in geographic concentrations rather than being randomly distributed. This finding suggests that place-based strategies may be particularly effective. Geographic targeting can help direct resources toward communities experiencing multiple overlapping disadvantages.

Institutionalizing equity does not necessarily require creation of a large new bureaucracy. Rather, it involves incorporating equity considerations into planning, budgeting, implementation, monitoring, and evaluation processes throughout government. Ministries can routinely ask:

Who is benefiting?

Who is not benefiting?

Where are disparities widening or narrowing?

Which populations require additional support?

These questions can help transform equity from an abstract principle into an operational decision-making framework.

Looking toward 2050, Ethiopia's success should be measured not only by improvements in national indicators but also by reductions in avoidable disparities between regions and populations. The country's greatest opportunities for future gains may lie among communities that remain furthest behind.

Policy Actions

Establish an Equity Framework

- Develop a national health equity strategy or framework.
- Incorporate equity objectives into national and regional development plans.
- Require major programs to assess potential equity impacts.

Strengthen Equity Monitoring

- Routinely disaggregate indicators by:
 - Region
 - Residence (urban/rural)
 - Wealth
 - Education
 - Gender
 - Other relevant characteristics
- Establish equity dashboards and monitoring systems.

Promote Geographic Targeting

- Utilize DHS, census, and administrative data to identify high-need communities.
- Incorporate GIS and spatial analysis into planning and resource allocation.
- Prioritize investments in persistent hot spots of disadvantage.

Build Cross-Sector Collaboration

- Coordinate policies across:
 - Health
 - Education
 - Agriculture
 - Water and sanitation

- Transportation
- Social protection
- Women's affairs
- Develop shared equity objectives across ministries.

Institutional Capacity Building

- Train government staff in health equity concepts and measurement.
- Incorporate equity considerations into routine program management.
- Promote equity-focused research and evaluation.

Community Engagement

- Involve communities in identifying priorities and designing solutions.
- Strengthen participation of underserved populations in planning processes.

Looking Ahead to 2050

If the first quarter century of Ethiopia's health transformation was primarily about expanding services and improving national indicators, the next quarter century may increasingly be about ensuring that progress reaches everyone. An explicit commitment to equity can help Ethiopia move from a story of national improvement to a story of broadly shared development. By embedding equity into planning, implementation, and evaluation across all sectors, Ethiopia can ensure that future gains are not only larger, but also fairer and more sustainable.

Given my background in California's Office of Health Equity, I would consider this recommendation one of the most original contributions in the manuscript because it shifts the discussion from "**What improved?**" to "**Who benefited, who did not, and what should we do about it?**" That is precisely the conversation Ethiopia will increasingly need as it moves from basic coverage expansion toward inclusive development.

9. Strengthen Data Systems, Analytics, and Research Capacity

Ethiopia's remarkable demographic and health achievements over the past quarter-century would not have been possible without investments in data collection, monitoring, and research. National surveys such as the Ethiopia Demographic and Health Survey (EDHS), population censuses, administrative reporting systems, disease surveillance programs, and specialized research studies have provided the evidence base that informed policy decisions, guided investments, and enabled the country to track progress over time. Indeed, the analyses presented throughout this report are made possible by high-quality longitudinal datasets spanning multiple decades.

As Ethiopia looks toward 2050, the importance of robust data systems will only increase. The country's demographic transition, epidemiological transition, rapid urbanization, technological change, climate-related challenges, and evolving health needs will require increasingly sophisticated information systems to support timely, evidence-based decision-making. Future success will depend not only on collecting more data, but also on improving data quality, accessibility, integration, interpretation, and use.

EDHS remains one of the country's most valuable public goods. Few countries in Africa possess a comparable record of nationally representative demographic and health data spanning more than two decades. Continued support for the EDHS should remain a national priority. Maintaining regular survey cycles will allow policymakers to assess trends, identify emerging challenges, evaluate interventions, and benchmark progress against national and international goals.

At the same time, surveys alone are insufficient. Administrative health information systems must continue to improve in quality, completeness, timeliness, and geographic coverage. Routine health information systems have the advantage of providing continuous data rather than periodic snapshots. When functioning effectively, they can serve as early warning systems for emerging problems while enabling local managers to make informed operational decisions.

An equally important challenge involves moving from **data collection to data use**. Many countries have succeeded in generating large volumes of data but struggle to convert information into action. Ethiopia should prioritize building a culture of evidence-informed decision-making at all levels of government. Data should become a routine part of planning, budgeting, implementation, monitoring, and evaluation processes.

The analyses conducted for this report also highlight the value of disaggregated and geographically detailed data. National averages often conceal important differences among regions, districts, communities, and population groups. Future data systems should increasingly support subnational analysis and equity-focused monitoring. Geographic information systems (GIS), spatial analytics, dashboards, and interactive data visualization tools can help decision-makers identify patterns that might otherwise remain hidden.

Building analytical capacity is equally important. Investments in data systems yield limited returns if institutions lack the ability to interpret and use the information generated. Ethiopia should continue strengthening capacity in epidemiology, biostatistics, demography, health informatics, GIS, survey methodology, data science, monitoring and evaluation, and implementation research. Universities, research institutes, government agencies, and development partners all have important roles to play in this effort.

The emergence of artificial intelligence (AI) presents new opportunities as well. AI-assisted analytics can help automate routine analyses, improve data quality checks, generate visualizations, identify anomalies, and translate technical findings into policy-

relevant language. However, as discussed elsewhere in this report, AI should be viewed as a tool that complements—not replaces—human expertise and judgment.

A particularly important area for future investment is implementation and operational research. Ethiopia has demonstrated that it can successfully pilot and scale innovative programs. The next challenge is understanding why some interventions succeed in certain settings and not others. Research that focuses on implementation, service delivery, behavioral change, and local context may generate greater policy value than increasingly complex statistical modeling detached from operational realities.

Looking toward 2050, Ethiopia has an opportunity to become a regional leader in evidence-based policymaking. By strengthening data systems, improving analytical capacity, embracing new technologies, and promoting a culture of evidence use, the country can ensure that future demographic and health decisions are guided by timely, accurate, and actionable information.

Policy Actions

Strengthen National Data Infrastructure

- Sustain regular implementation of the Ethiopia Demographic and Health Survey (EDHS).
- Continue investments in population censuses, surveillance systems, and administrative datasets.
- Improve interoperability across data systems and institutions.

Enhance Routine Health Information Systems

- Improve data quality, completeness, timeliness, and geographic coverage.
- Strengthen data validation and quality assurance procedures.
- Expand digital reporting systems and real-time monitoring capabilities.

Promote Data Use for Decision-Making

- Institutionalize evidence-based planning and budgeting processes.
- Require routine use of data in program monitoring and performance reviews.
- Develop user-friendly dashboards and decision-support tools.

Expand Geographic and Equity Monitoring

- Routinely disaggregate indicators by region, district, urban-rural residence, wealth, education, and gender.
- Expand GIS and spatial analytics capabilities.
- Use geographic targeting to identify underserved populations and emerging disparities.

Strengthen Research and Analytical Capacity

- Invest in training programs for epidemiology, demography, biostatistics, GIS, and health informatics.
- Strengthen partnerships between government agencies, universities, and research institutions.
- Support young researchers and analysts through mentorship and professional development programs.

Advance Implementation and Operational Research

- Prioritize research focused on service delivery, behavioral change, and program effectiveness.
- Encourage studies that directly inform policy and operational decisions.
- Promote decision-first analytical approaches that emphasize interpretation and practical relevance.

Leverage Digital Innovation and AI

- Utilize digital tools for data collection, analysis, and dissemination.
- Explore AI-assisted approaches for quality assurance, visualization, and reporting.
- Develop governance frameworks to ensure ethical and responsible use of emerging technologies.

Strengthen Open Data and Knowledge Sharing

- Improve access to public datasets while protecting confidentiality.
- Encourage publication and dissemination of research findings.
- Foster collaboration among government, academia, civil society, and development partners.

Looking Ahead to 2050

The next phase of Ethiopia's demographic and health transition will require increasingly sophisticated decisions in an environment characterized by rapid change and growing complexity. Strong data systems and research capacity will be essential for successfully navigating this future. If the first quarter century of progress was built on expanding services and generating data, the next quarter century should focus on transforming data into insight, insight into action, and action into measurable improvements in health and wellbeing. In this sense, investments in data systems and research are not merely technical priorities—they are strategic investments in Ethiopia's capacity to shape its own future.

10. Promote Exclusive Breastfeeding as a Foundational Child Survival and Human Capital Strategy

Exclusive breastfeeding (EBF) during the first six months of life remains one of the most effective, affordable, and scalable interventions available for improving child survival, nutrition, and long-term human development. Among the many demographic and health indicators examined in this report, EBF stands out for a unique reason: despite substantial progress in child survival, maternal health, immunization, and health service utilization, exclusive breastfeeding rates have remained largely unchanged over the past quarter century. National surveys consistently indicate that approximately 50–60 percent of Ethiopian infants are exclusively breastfed during the first six months of life, with little evidence of sustained long-term improvement.

This stagnation represents one of the clearest missed opportunities identified in this review. Unlike many health interventions that require substantial infrastructure, expensive technologies, or long implementation periods, exclusive breastfeeding is a low-cost intervention with immediate and far-reaching benefits. Yet Ethiopia has not achieved the same transformational gains in EBF that it has achieved in many other areas of maternal and child health.

The health benefits of exclusive breastfeeding extend across multiple dimensions of population health. Infants who are exclusively breastfed experience substantially lower risks of diarrheal disease, respiratory infections, malnutrition, and other causes of childhood illness and death. Breast milk provides optimal nutrition during the first six months of life while simultaneously strengthening immune system development and protecting infants from environmental exposures that often accompany the early introduction of foods and liquids.

The analysis presented in this report demonstrates that EBF functions as a **multiplier intervention**, influencing several outcomes simultaneously. Improvements in breastfeeding contribute directly to reductions in infant mortality, improvements in nutritional status, enhanced cognitive development, and healthier growth trajectories. Few public health interventions affect so many outcomes at once.

The benefits extend beyond childhood. Growing evidence suggests that breastfeeding supports improved educational attainment, cognitive performance, and productivity later in life. Consequently, EBF should not be viewed solely as a child survival intervention but also as an investment in Ethiopia's future human capital.

Mothers benefit as well. Exclusive breastfeeding contributes to healthier birth spacing through lactational amenorrhea, reducing the likelihood of closely spaced pregnancies that can increase risks for both mothers and infants. Breastfeeding is also associated with reduced risks of certain maternal health conditions, including breast and ovarian cancers. Thus, EBF supports both child and maternal health objectives simultaneously.

A particularly important finding from the deeper EBF analysis is that socioeconomic gradients appear relatively weak compared to many other health indicators. The most striking pattern is not education, wealth, or residence but rather the steep decline in breastfeeding continuity as infants age. Many Ethiopian mothers initiate breastfeeding successfully, but maintaining exclusivity through the full six-month period remains challenging. This suggests that future efforts should focus not only on breastfeeding initiation but also on sustained support during the critical months that follow birth.

The World Health Organization recommends EBF rates of at least 70 percent. Ethiopia's current level of approximately 57 percent suggests substantial room for improvement. Achieving the WHO benchmark could generate significant gains in child survival, nutrition, and development while reinforcing progress already achieved in other sectors.

Looking toward 2050, EBF represents one of Ethiopia's most promising opportunities for accelerated improvement. Unlike many interventions that require major technological breakthroughs or large-scale infrastructure investments, breastfeeding promotion can be expanded relatively quickly through existing health systems and community platforms. The Health Extension Program, maternal health services, postnatal care programs, and community outreach networks already provide much of the infrastructure needed to support further progress.

Ultimately, if women's education represents one of Ethiopia's most important long-term investments, exclusive breastfeeding may represent one of its most important short-term opportunities. Together, they form complementary pillars of a strategy designed to improve health, strengthen human capital, and accelerate national development.

Policy Actions

Elevate EBF as a National Priority

- Recognize exclusive breastfeeding as a core child survival and human capital strategy.
- Establish national targets aligned with WHO recommendations.
- Incorporate EBF indicators into routine health sector performance monitoring.

Strengthen Facility-Based Support

- Ensure breastfeeding counseling is provided during antenatal, delivery, and postnatal care.
- Expand implementation of Baby-Friendly Hospital Initiative standards.
- Promote immediate skin-to-skin contact and early initiation of breastfeeding following birth.

Strengthen Community-Based Support

- Utilize the Health Extension Program to provide ongoing household-level counseling.
- Establish peer-support groups and community breastfeeding champions.
- Engage fathers, grandparents, and community leaders in breastfeeding promotion efforts.

Focus on Continuity, Not Just Initiation

- Prioritize support during months 2–5, when breastfeeding rates typically decline.
- Strengthen follow-up through postnatal care visits and community outreach.
- Address common breastfeeding challenges that lead to early supplementation.

Address Workplace and Social Barriers

- Expand maternity leave protections where feasible.
- Encourage breastfeeding-friendly workplace policies.
- Promote social norms that support breastfeeding in both rural and urban settings.

Integrate EBF Across Programs

- Link breastfeeding promotion with:
 - Maternal health services
 - Nutrition programs
 - Child survival initiatives
 - Family planning services
 - Early childhood development efforts

Improve Monitoring and Research

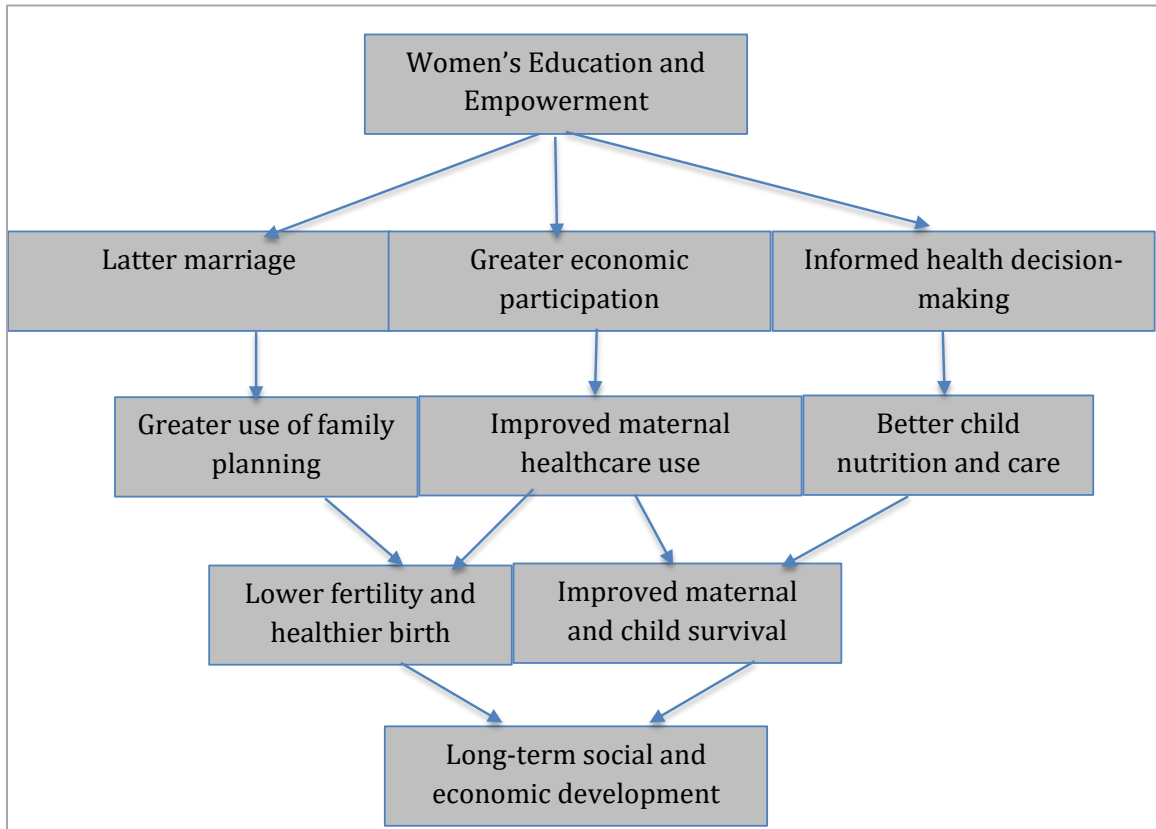
- Continue tracking EBF trends through EDHS and routine information systems.
- Support operational research focused on barriers to sustained breastfeeding.
- Use regional analyses to identify areas requiring targeted interventions.

Looking Ahead to 2050

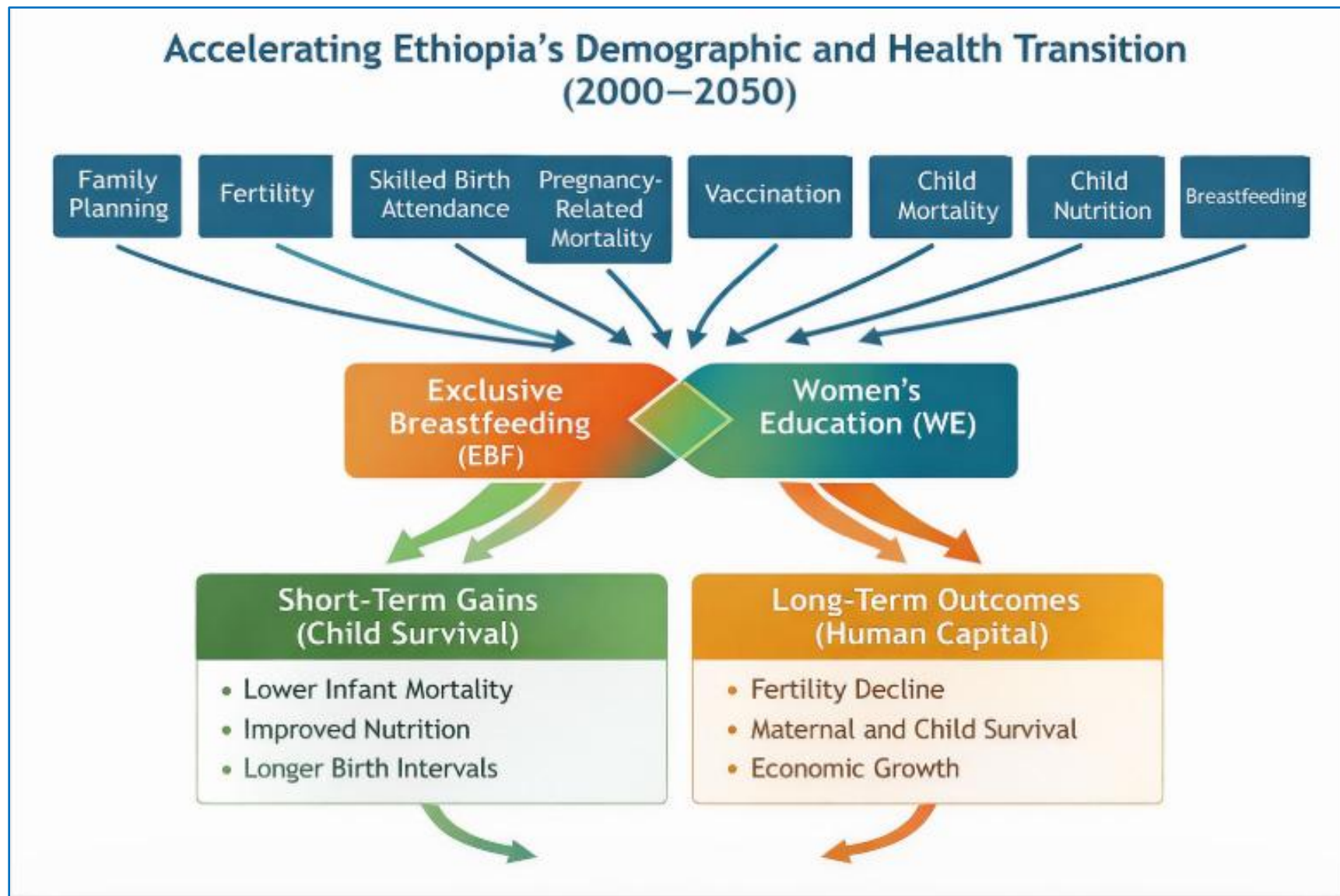
The next phase of Ethiopia's child health success story may depend less on discovering new interventions than on fully utilizing one already known to work. Exclusive breastfeeding is uniquely positioned to accelerate progress across multiple domains simultaneously. If Ethiopia can increase EBF rates from current levels toward or beyond 70 percent, the country could achieve further reductions in child mortality, improvements in nutrition, stronger cognitive development, healthier birth spacing, and enhanced human capital formation. Few interventions offer such broad benefits at such low cost. For this reason, exclusive breastfeeding should be regarded not as a supporting

recommendation, but as one of the central pillars of Ethiopia's maternal and child health strategy for the decades ahead.

Appendix 1. Women's Education and Empowerment Pathway



Appendix 2: Exclusive Breastfeeding (EBF) and Women's Education (WE)—Two Priority Areas with Exceptional Potential to *accelerate* Gains Across All Systems



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