



NATIONAL HEALTH EQUITY SURVEY 2022/23

Key Findings

Ethiopian Public Health Institute Addis Ababa

> Ministry of Health Addis Ababa

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The 2022/23 National Health Equity Survey (NHES 2022/23) was implemented by the Ethiopian Public Health Institute (EPHI), in partnership with the Ministry of Health (MOH), under the overall guidance of the Technical Working Group (TWG). Additional information about the 2022/23 NHES may be obtained from the Ethiopian Public Health Institute (EPHI), Gulele Arbegnoch Street, Gulele Sub City, Addis Ababa, Ethiopia. Telephone: +251-11-275-4647; fax: +251-11-275-4744; website: http://www.ephi.gov.et.

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ACRONYMS and ABBREVIATIONS

ANC	Antenatal Care
ARTI	Acute Respiratory Tract Infection
CBHI	Community Based Health Insurance
Con-index	Concentration index
DPT	diphtheria, pertussis, tetanus vaccine
EA	Enumeration Area
EPHI	Ethiopian Public Health Institute
FMoH	Federal Ministry of Health
GP	General practitioner
HepB	Hepatitis B (vaccine)
Hib	Haemophilus influenzae type B (vaccine)
HSTP	Health Sector Transformation Plan
IFSS	Internet File Streaming System
IPV	Inactivated Polio Vaccine
MoH	Ministry of Health
NHES	National Health Equity Survey
OPV	Oral Polio Vaccine
PNC	Postnatal Care
SBA	Skilled birth attendance
SNNPR	South Nations Nationalities Peoples Region
SW-Eth	Southwest Ethiopia
WHO	World Health Organization
ZHD	Zone Health Department

1. INTRODUCTION AND SURVEY OBJECTIVES

Globally, health equity is one of the critical agendas to be addressed since it has been clearly put in Alma-Ata declaration in 1978 as a priority for all countries [1]; [2]. It is one of the sustainable development goal focus areas and one of the health sector transformation plan agendas. So, the health sector of Ethiopia has designed health equity strategy to address health equity in Ethiopia by ensuring fair allocation of human and material healthcare resources to people at all levels contributes to better healthcare outcomes [3]. To monitor and address health equity strategies and programme, it is important to know health equity status in the country. World health organization (WHO) defines health equity as the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically[4],[5]. The unfair inequities due to avoidable causes are specific forms of inequalities [6].

Health inequality defined as the systematic, avoidable and unfair differences in health resource, service, and/or outcome that can be observed between populations, between social groups within the same population or as a gradient across a population ranked by social position (resources, opportunities, and power) and among geographical regions, which can be measured and monitored [7], [8].

The 2022/23 National Health Equity Survey (NHES) in Ethiopia is the first health household survey conducted in Ethiopia with the objective of measuring health equity. Data collection was conducted from September 27, 2022 to December 20, 2022 at households of selected enumeration areas (EAs), and public health administrative structures (MoH, Regional Health Bureaus, and Zone Health Departments) of Ethiopia. The 2022/23 National Health Equity survey finance was covered by government of Ethiopia/MoH/. This report presents the key findings of the 2022/23 NHES.

The primary objective of 2022/23 National Heath Equity Survey (NHES) is to measure health equity status in health resource access, service utilization, and outcome in Ethiopia. In addition, to explore the perception of health policy makers, planners and managers on health equity and its implementation in health system of Ethiopia.

The information collected through the 2022/23 NHES is intended to inform policymakers, programme managers in evaluating and designing Programmes and strategies for improving the health equity of the country's population.

2. SURVEY IMPLEMENTATION

2.1. Study Design

The study design was a cross sectional mixed method using quantitative and qualitative approaches. The quantitative aspect targeted community-based household primary data collection and public health administrative structure (Zone Health Departments), while the qualitative study addressed heads and planners in the existing public health administrative structures of the country (at 12 Regional Health Bureaus (except Tigray region) and MoH).

2.2. Sample Design for Household Survey

The sampling frame used for the 2022/23 National Health Equity Survey (NHES) is the Ethiopia Population and Housing Census, which was prepared in 2019 by the Ethiopia Central Statistical Services. The frame consists of 147,602 Enumeration Areas (EA), which covers the entire country. An EA is a geographical grid consisting of a convenient number of housing units. Administratively, Ethiopia has been divided into eleven geographical regions and two city administrations during this survey data collection period. The sample for the 2022/23 NHES was designed to provide estimates of key indicators for the country as a whole, for urban and rural areas separately, and for each of the eleven regions and the two city administrations.

Two stages cluster sampling were used. EAs were considered as the primary sampling unit and households were considered as the secondary sampling unit. Accordingly, a total of 421 EAs and 9262 households were sampled.

A fresh household listing was carried out in all the 386 selected EAs in all regions (except Tigray region), and the listed households were served as a sampling frame for the selection of households for the second stage.

In the second stage of the selection, a fixed number of 22 eligible households per cluster were selected with a systematic random selection from the newly created household listing. Women age 15-49 years and mothers (caregivers) with under five children, and all household heads/spouses age 18 or greater than 18 who were permanent residents of the selected households were eligible to be interviewed.

Sampling weights were calculated based on sampling probabilities separately for each sampling stage and for each cluster.

2.3. Questionnaires

Two quantitative questionnaires were used: household questionnaire and administrative structure (Zone Health Department) questionnaire. A key informant interview (KII) questionnaire which was used to collect qualitative data.

The household questionnaire was adapted from EDHS and expanded programme for immunisation (EPI) standard questionnaires to reflect the population and health equity issues relevant to Ethiopia. The household questionnaire contained 3 sections: section one- household head interview, section two-maternal health services utilizations, and section three-

childhood immunization and childhood major diseases. Inputs were collected and captured from various stakeholders to refine the questionnaires. Following the questionnaires finalization in English they were translated into local languages: 'Amarigna', 'Afaan Oromo', 'Tigrigna', 'Somaligna'.

The household questionnaire section one was used to identify women who were eligible for individual interview. The household questionnaire section one was also used to collect information on characteristics of household's dwelling unit, that are source of water, type of toilet facilities, materials used for the floor/ceiling of the dwelling unit, and ownership of various durable goods including land and domestic animals.

The household questionnaire section two and section three were used to collect information from eligible women age 15-49 (one eldest woman with youngest under five child was selected if there were more than one woman in each selected household) and from their children age 0-59 months, respectively that contained maternal health services utilizations, and childhood immunization and childhood major diseases. The interviewers used tablet computers to record responses during the interviews.

Administrative structure level (Zone Health Departments) questionnaire was used to collect information mainly on health care resource availability, including health facilities and health workforce based on 2014 Ethiopian fiscal year data from all regions of Zone/Sub-city/Special woreda Health Departments (except Tigray region due to security problem during data collection period). Verification was done by each respective regional health bureau's monitoring and evaluation experts/regional coordinators to verify the number of health facilities and number of core health workfors in each region.

The qualitative approach employed key informant interview (KII) questionnaire to collect qualitative data from heads, policy makers and planners in the existing public health administrative structures of the country such as 10 Regional and 2 City Administration Health Bureaus (2 interviewees from each), and 4 interviewees from MoH.

2.4. Training of Field Staff

EPHI recruited and trained 96 field staff for the main fieldwork to serve as coordinators, team supervisors, and interviewers. The training was conducted from September 19-26, 2022 at Kilole Hotel in Bisheftu. The training course consisted of instruction regarding interviewing techniques and field procedures, a detailed review of questionnaire content, instruction on how to administer the paper and electronic questionnaires, mock interviews between participants in the classroom, and practice interviews with real respondents in areas outside the survey sample. Field practice was organized for two-days, from September 25-26/2022, to provide trainees with additional hands-on experience before the actual fieldwork. A total of 35 teams were formed for field practice. In each region 2 to 5 teams were assigned and one to two team supervisors per region. Team supervisors and interviewers received instructions and practice using the computer-assisted personal interview (CAPI) system to perform supervisory activities, dealing with duplicated cases and transferring interviews to the central office via a secure Internet file streaming system (IFSS).

2.5. Field Work

The NHES data collection took place from September 27, 2022 to December 20, 2022 and fieldwork was carried out by 35 field teams, each consisting of two interviewers (one of them was team leader in addition) and one driver. In addition to the field teams, fourteen regional coordinators were assigned for coordinating and monitoring the field work. The regional coordinator regularly supervised and monitored the respective teams' work and progress throughout the fieldwork period, and collected Zone Health Departments' data and sent to the center. In addition to teams' regional coordinator, regional focal person was assigned from each regional health bureau for close follow up, field teams support and any administrative issues facilitation. Moreover, central coordinators had been assigned for each region's teams from EPHI and MoH and conducted monitoring, technical support and supervision of their respective field teams in the field, and gave feedback to the field teams as well as to the central team to fix matters raised on time. The office data managers had monitored the completeness and possible errors occurring during data encoding and taken correction.

2.6. Data processing

The electronic data collection tool (CSPro software) was created and configured in the tablet, and used by data collectors. All electronic data files were transferred via the secure internet file streaming system (IFSS) to the EPHI central server in Addis Ababa, where they were stored on a password-protected computer. The data were processed by EPHI staff members who took part in the main fieldwork training. During the fieldwork, field-check tables were generated to check various data quality parameters, and specific feedbacks were given to the teams to improve performances.

2.7. Data analysis

Quantitative data

In this study, based on socioeconomic (education level, wealth), demographic (sex, age) and geographic (regions, residence) indicators equity analysis was conducted using relative measure (ratio, concentration index/curves) and absolute measure (absolute difference) by examining the inequality of population categories/groups and regions under health care services utilization, health care resources accessibility and health outcomes (listed with their numerators and denominators in **Annex 1**). The absolute analysis was conducted using the range (absolute difference) within each socioeconomic, demographic and geographic indicator. The ratio of two groups within each socioeconomic indicator variable was taken that means the quantitative relation between two amounts showing the number of times one value contains or is contained within the other (urban to rural residences, male to female, highest to lowest value). A positive concentration index (Con-index >0) means that the health variable of interest is more concentrated among the rich (prorich) and higher education level while a negative index (Con-index < 0) signifies the opposite poor (pro-poor) and to the low education level, and if con-index is zero, there is no inequality [9].

We used equity stratifiers (background characteristics) such as age, region (12 regions), residence (Urban/Rural), gender (male/female), education level (no education, primary, secondary, higher), and wealth index (poorest, poor, middle, rich, richest). Wealth index was calculated using principal component analysis (PCA) weights for each asset variable, aggregated score was calculated for each of the surveyed households which was grouped into quintiles that 1 (Q1) representing the poorest 20% of households in the sample and 5 (Q5) representing 20% of the richest (better-off).

Sampling weights were used for analysis using the 2022/23 NHES household data to ensure the actual representativeness of the survey results at the national level as well as the domain level. Therefore, only weighted percentages are shown in the tables and figures of the household survey results.

In each region, density of public sector core health professionals per 10,000 population and public sector health facility to population ratio were calculated based on the total population number of the respective region which was used in 2014 Ethiopian fiscal year health and health related indicators report of Ministry of Health (MOH, 2022). Density of public sector core (front liner) health professionals (medical doctor (GP+ specialist), nurses, and midwifery) per 10,000 population for each region, i.e. the number of each category health professional or the sum of the three categories professionals' numbers (medical doctor, nurses, and midwifery) of the region divided by the respective region's population. The health facility to population was calculated by dividing the number of the population in the region by the number of the health facility type of the respective region. The density as well as the ratio has been competed for each category professional and health facility, respectively, to measure inequality among regions.

Qualitative data

In qualitative data analysis thematic coding of transcribed and translated in-depth interviews were used. Codebook was prepared which included the list of pre-codes and what they mean and entered in to Nvivo 12 software. Then, the data was analysed using a thematic approach by conducting an on-going content analysis. Data analysis was utilized based on various strategic options. Emerging themes were developed from the expanded interviews and discussions. In general, the qualitative data analysis followed the following five interrelated steps: reading, coding, displaying, reducing, and interpreting.

3.KEY FINDINGS: QUANTITATIVE

3.1. RESPONSE COVERAGE

Table 1 shows response coverage for the 2022/23 national health equity survey. A total of 421 enumeration areas (EAs) were sampled. Thirty-four clusters (EAs), in Tigray region, were excluded from the survey due to security problem during data collection. One cluster in Oromiya region had been dropped after repeated replacement due to security problem. Finally, data were collected from 386 clusters. A total of 8,492 households were selected for the interview. Of the selected households, 8,429 were successfully interviewed and resulting a response coverage of 99 percent. Overall, there was slight variation in response coverage between urban and rural residences.

Table 1: Enumeration areas (EAs), households' and individuals' survey and interviews; Ethiopia NHES 2022/23

Sampled EAs & households and interviews	Residence			
	Urban	Rural	Total	
Enumeration areas				
-EAs sampled	164	257	421	
-EAs surveyed ¹	152	234	386	
Household interviews				
-Households selected	3344	5148	8492	
-Households interviewed	3318	5111	8429	
-Household response percentage ²	99.2	99.3	99.3	

¹Thirty four EAs were excluded from the survey due to security problem in Tigray region during data collection, and one enumeration area in Oromiya region was also dropped due to security problem (after attempting 2 times to replace).

²(Households interviewed/households selected) X 100

3.2. ACCESS TO IMPROVED WATER SOURCE AND IMPROVED SANITATION FACILITY

3.2.1. Access to improved water source

- In Ethiopia, 74% of households have access to improved water source¹.
- Access to improved water source varied from 48% in SW. Ethiopia to 99% in Addis Ababa (**Figure 1**), and the absolute difference between them was 52 percentage points.



Figure 1: Percent distribution of households accessed to improved water source by region; Ethiopia NHES2022/23

- The absolute difference between urban (95%) and rural (66%) households in accessing improved water source was 29 percentage points (**Figure 2**). The ratio of urban to rural (ratio of 1.44) households indicated access to improved water source was 44 percent more in urban than in rural residence.
- The concentration curve for access to improved water source that lies below the line of equality and the positive concentration index (0.15) indicated improved water source was significantly concentrated among households with mothers who have higher level of education (**Figure 3**).



Figure 2: Percent distribution of households accessed to improved water source by residence; Ethiopia NHES2022/23



*Con-index: concentration index

Figure 3: Concentration curve and concentration index (con-index) of access to improved water source by education level; Ethiopia NHES2022/23

¹ Improved water source includes: piped water, tube well or borehole, protected dug well, protected spring, rain water, tanker truck/cart with small tank and bottled water.

3.2.2. Access to improved sanitation facility

- Overall, 33% of households accessed to improved sanitation facility in Ethiopia (Figures 4 & 6).
- The coverage ranged from 17% in Gambela region to 89% in Addis Ababa (**Figure 4**), which have 71 percentage points absolute difference between the two regions.
- The concentration curve for access to improved sanitation facility that lies below the line of equality and the positive concentration index (0.32) indicated the improved sanitation facility was significantly concentrated among households with mothers who have higher level of education (**Figure 5**).





Figure 5: Concentration curve and con-index of access to improved sanitation facility by education level; Ethiopia NHES2022/23





Figure 6: Percent distribution of households who have access to improved sanitation facility by residence, and mother's education level; Ethiopia NHES2022/23

Access to improved sanitation facility was higher in urban (66%) than in rural residences (20%) (Figure 6). The ratio of urban to rural (3.4) households in accessing improved sanitation facility showed inequality that access to improved sanitation facility was 3.4 times greater in urban than in rural residence.

3.3. REPRODUCTIVE HEALTH/FAMILY PLANNING/

Contraceptive use is critical for effective family planning which enable women to avoid unplanned or unwanted pregnancies, prevent unsafe abortions, and space the births of their children. The Ministry of Health (MoH) developed the second health sector transformation plan, which aimed to increase the contraceptive prevalence rate (CPR) to 50 percent in 2024/25 using designed initiatives like increase demand for quality contraceptive service, expand family planning and sexual and reproductive health services, and universal access to quality and comprehensive rights-based family planning information and services at all levels of health care delivery system [10].

3.3.1. Any contraceptive method utilization

- Any contraceptive² method utilization in Ethiopia was 45.9 percent.
- The coverage ranged from 3% in Somali region to 62% in SW. Ethiopia region (**Figure 8**). The absolute difference between the highest and the lowest coverage region was 59 percentage points.



Figure 7: Percent of married or in union women age 15-49 receiving any contraceptive method by age, educational, residence, and wealth; Ethiopia NHES2022/23

- The ratio of any contraceptive method utilization from urban to rural residence was 1.4.
- The concentration curves for any contraceptive utilization that lie below the line of equality and the concentration indices showed any contraceptive coverage was significantly concentrated among women whose education level was higher and the richest wealth index (**Figure 9**).



Figure 8: Percent of women receiving any contraceptive method by region; Ethiopia NHES2022/23



Figure 9. Concentration indices and curves of any contraceptive method utilization among married or in union women age 15-49 by education and wealth; Ethiopia NHES2022/23

² Utilisation of any contraceptive methods include: male and female sterilization, injectables, intrauterine devices (IUDs), contraceptive pills, implants, female and male condoms, the Standard Days Method, emergency contraception, and traditional methods such as Lactational amenorrhea method, Rhythm method and Withdrawal.

3.3.2. Modern contraception method utilization

- Modern contraceptive³ utilization among married or in union women in Ethiopia was 45.6%.
- It ranged from 3% in Somali region to 62% in SW. Ethiopia region (**Figure 10**).
- Modern contraceptive utilization was 40% more in urban than rural residences (ratio of 1.4).
- The concentration curves for modern contraceptive utilization that lie below the line of equality and concentration indices showed modern contraceptive utilization significantly concentrated among women with higher education level and the richest wealth index (Table 2; Figure 11).



Figure 10: Percent distribution of married or in union women age 15-49 received modern contraceptive method by region; Ethiopia NHES2022/23

Table 2: Percentage of married or in union women age 15-49 receiving modern contraceptive method by age, residence, education, and wealth; Ethiopia NHES2022/23

Background characteristics	Women used modern contraceptive method (%)	Summary measures of inequality
(Equity stratifiers)		
Mother's age		
15-19	42	Ratio (Highest: Lowest):1.5
20-24	44	
25-29	50	
30-34	46	
35-39	44	
40-44	40	
45-49	33	
Residence		
Urban	58	Ratio (Urban: Rural) =1.4
Rural	41	
Education		
No education	36	Con-index: 0.22(0.13, 0.31); p: 0.0005
Primary	49	
Secondary	65	
Higher	63	
Wealth quintile		-
Poorest	38	
Poor	42	Con-index: 0.20(0.03, 0.32); p: 0.0370
Middle	42	
Rich	58	
Richest	62	
Total	45.6	



Figure 11: Concentration curves of modern contraceptive method use among married or in union women age 15-49 by maternal education level and wealth; Ethiopia NHES2022/23

³ Utilization of modern contraceptive methods include: male and female sterilization, injectables, intrauterine devices (IUDs), contraceptive pills, implants, female and male condoms, the Standard Days Method and emergency contraception.

3.4. MATERNAL HEALTH CARE

It is important to have proper care during pregnancy and delivery for the health of both the mother and the baby. To reduce both maternal and neonatal morbidity and mortality it is critical to take key interventions, such as skilled care during pregnancy, childbirth, and in the postpartum period. It is also important to evaluate the status and equity of these health services utilization distribution across equity stratifiers.

3.4.1. Antenatal care and number of antenatal care (ANC) visits

Eighty nine percent of women age 15-49 with a live birth in the 5 years before the survey received at least one antenatal care (ANC1+) visit from a skilled provider for their most recent birth; while 54% received at least four antenatal care (ANC4+) visits (Figures 12, 13).

Table 3: Percentage of women receiving ANC1+ and ANC4+ services by age, residence, education, and wealth; EthiopiaNHES2022/23

Equity stratifiers	Women receiving (%)		Summary measures of inequality for	
	ANC1 ⁺	ANC4+	ANC1 ⁺	$ANC4^+$
Mother's age				
15-19	84	47		
20-24	89	53		
25-29	89	54		
30-34	92	55	Patio (highest: lowest) -	Patio (highest: lowest) = 1.24
35-39	89	56	Kato (ingliest. lowest) =	Ratio (llightest. lowest) = 1.24
40-44	90	49	1.09	
45-49	89	45		
Residence				
Urban	88	67	Ratio (Urban: Rural) $= 0.98$	Ratio (Urban: Rural) =1.42
Rural	90	47	````	×
Education level				
No education	88	45	Con-index*:.0.02(-0.02.	Con-index: 0.19(95% CI: 0.13, 0.25):
Primary	92	53	0.06): p: 0.4542	p<0.00001
Secondary	89	66	0.00), p. 0.4342	p<0.00001
Higher	88	74		
Wealth quintile				
Poorest	90	41	Con-index: -0.01(-0.03	Con-index:0.25(95% CI: 0.20, 0.30);
Poor	90	47	0.01): p: 0.2021	p < 0.00001
Middle	91	55	0.01), p. 0.3031	p<0.00001
Rich	90	62		
Richest	87	74		
Total	89	54		

*Con-index: concentration index

In Table 3, the concentration indices for receiving ANC4+ visits indicated that ANC4+ visits coverage was significantly concentrated among women with higher level of education and the better-off wealth status.



Figure 12: Percent of women receiving ANC1+ by region; Ethiopia NHES2022/23

The absolute difference between the highest and the lowest performing regions was 33 percentage points in receiving ANC1+ whereas 62 percentage points in receiving ANC4+ visits.



Figure 13: Percent of women receiving ANC4+ by region; Ethiopia NHES2022/23

3.4.2. Institutional delivery and skilled birth attendance

3.4.2.1. Institutional delivery

Institutional delivery is the percentage of the last live births in the five years preceding the survey delivered at a health facility (hospital, health center or health post).

- Overall, 56% of the last live births in the 5 years preceding the survey occurred in a health facility (Figure 14).
- The ratio of urban to rural residents who gave live births in health facility was 1.94, indicating the percentage of live births in health facility was 94 percent greater among urban (87%) than among rural residents (45%) (Figure 14).



Figure 14: Percent of delivery in health facility by age, residence, education, and wealth; Ethiopia NHES2022/23



Figure 15: Percent of women's institutional delivery by region; Ethiopia NHES2022/23 $\,$

• The percentage distribution of live births at health facility was varied among regions, ranging from 39% in Afar to 99% in Addis Ababa (**Figure 15**) with 59 percentage points absolute difference between them. Giving live births at health facility was 2.5 times higher in Addis Ababa than in Afar region (ratio of 2.5).

In **Figure 16**, the concentration curves that lie below the line of equality for live births at health facility and concentration indices indicated that institutional delivery was significantly concentrated among women with higher level of education and among the richest wealth quintile.



Figure 16: Concentration indices and curves of institutional delivery by wealth and education level; Ethiopia NHES2022/23

3.4.2.2. Skilled birth attendance⁴ (SBA)

• Overall, 59% of the last live births delivered with the attendance of skilled providers in Ethiopia.

Table 4: Percentage of births attended by a skilled provider by age and residence; Ethiopia NHES 2022/23

Equity stratifiers	Percentage of delivery by a skilled provider	Summary measure of inequality
Mother's age		
15-19	59	
20-24	62	
25-29	59	
30-34	58	Ratio (Highest:
35-39	58	lowest) = 1.20
40-44	51	
45-49	59	
Residence		
Urban	87	Ratio (Highest:
Rural	48	lowest) = 1.82
Total	59	

- Percentage of births delivered with SBA was highest in Addis Ababa (99%) and lowest in Sidama (43%) (Figure 17), and their absolute difference and ratio were 56 and 2.32, respectively.
- The absolute difference between urban and rural residences for births delivered with SBA coverage was 39 percentage points.
- The concentration curves that lie below the line of equality for births delivered by SBA and concentration indices indicated SBA was significantly concentrated among women with higher level of education and women with better-off wealth status (**Figure 18**).



Figure 17: Percentage of births attended by skilled provider by region; Ethiopia NHES2022/23



Figure 17: Concentration curves of skilled birth attendance by wealth and education; Ethiopia NHES 2022/23

⁴ A skilled birth attendance is a percentage of live births in the five years preceding the survey assisted by a skilled provider which includes doctor, health officer, nurse, midwife and/or health extension worker.

3.4.3. Timing of first postnatal check for the mother and the newborn

3.4.3.1. First postnatal care (PNC) for mother

- Overall, 46% of women received a postnatal care (PNC) within 48 hours after birth in Ethiopia (Figures 19 & 20).
- The absolute difference and relative difference from urban to rural residences in utilizing the first PNC within 48 hours were 36 percentage points and ratio of 2.0, respectively.



Figure 18: Percent distribution of women receiving mother's first PNC in the first 2 days after giving birth by age, residence, education level, and wealth; Ethiopia NHES2022/23

• The coverage ranged from 26% in Afar to 86% in Addis Ababa (**Figure 20**); and their absolute difference was 60 percentage points and the ratio from the highest to the lowest coverage region was 3.29.



Figure 19: Percentage of women receiving mother's first PNC in the first 2 days after giving birth by region; Ethiopia NHES2022/23

The concentration curves for women receiving a PNC within 48 hours that lie below the line of equality and concentration indices showed PNC for mother was significantly concentrated among women with higher level of education and the richest wealth index (Figure 21).



Figure 20: Concentration curves and indices of women PNC within 2 days by education level and wealth; Ethiopia NHES2022/23

3.4.3.2. First postnatal care (PNC) for the newborn

- Forty three percent of new-borns received a PNC within 48 hours after birth in Ethiopia. The distribution showed inequality by residence, education level, wealth index, and region (Figures 22-24).
- The absolute difference and relative difference from urban to rural areas mothers in utilizing of the first PNC within 48 hours after birth were 37 percentage points and ratio of 2.13, respectively.



Figure 21: Percentage of new-borns receiving new-borns' first PNC in the first 2 days after birth by age, residence, education level, and wealth; Ethiopia NHES2022/23

- The highest (86%) and the lowest (25%) first PNC coverage were in Addis Ababa and Afar (Figure 23), respectively; and their absolute difference and relative difference were 60 percentage points and ratio of 3.37, respectively.
- The concentration curves for newborns receiving a PNC within 48 hours after birth that lie below the line of equality and positive concentration indices showed PNC service for newborns concentration among mothers of new-borns with the richest wealth index and higher level of education (**Figure 24**).



Figure 22: Percentage of new borns receiving first PNC within the first 2 days by region; Ethiopia NHES2022/23



Figure 23: Concentration indices and curves of PNC for newborns within 2 days by wealth and education level; Ethiopia NHES2022/23

3.5. CHILDHOOD IMMUNIZATION

According to WHO guideline Ethiopia had launched Expanded Programme for Immunisation (EPI) in 1980 and has implemented in both Health Sector Development Programmes (HSDPs) and in the Health Sector Transformation Plan (HSTP) [11] to address universal immunisation of children against vaccine-preventable diseases, such as tuberculosis, diphtheria, whooping cough (pertussis), tetanus, polio, measles, pneumococcal, Rota viruses, and Haemophilus influenzae type B (Hib).

3.5.1. Bacille Calmette-Guérin (BCG) vaccination

- Overall, the percentage of children age 12–23 months who received BCG vaccination was 73% in Ethiopia.
- There was equal percentage distribution between male and female (ratio of 1) children age 12-23 months in receiving BCG vaccination (**Table 5**).



Table 5: Percent of children age 12-23 months received BCG vaccination by sex, residence, age, and education level; Ethiopia NHES2022/23

Equity stratifiers	Children age 12-23 months vaccinated with BCG (%)	Summary measures of inequality
Sex		
Male	73	Ratio (Male: Female)
Female	73	=1
Residence		
Urban	78	Ratio (urban: rural)
Rural	71	=1.10
Mother's age		
15-19	84	
20-24	67	
25-29	74	Ratio (Highest:
30-34	75	Lowest) $=1.62$
35-39	74	
40-44	75	
45-49	52	
Mother's education	1	
No education	71	Con-index:0.06 (-
Primary	71	0.04, 0.20); p:0.2439
Secondary	80	1
Higher	80	
Total	73	

Figure 24: Percent of children age 12-23 months received BCG vaccination by region; Ethiopia NHES2022/23

- BCG vaccination coverage was highest in Addis Ababa (94%) and lowest in Afar region (28%) (Figure 25), and their absolute difference and ratio were 66 percentage points and 3.41, respectively.
- The concentration curve for BCG vaccination utilisation that lies below the line of equality and con-index (0.13) showed BCG vaccination was significantly concentrated among the richest quintile (Figure 26).



Figure 25: Concentration curve of BCG vaccination by wealth; Ethiopia NHES2022/23

3.5.2. All basic vaccinations for age 12-23 months

- Sixty percent of children age 12–23 months had received all basic vaccinations⁵ (Figure 27) in Ethiopia.
- All basic vaccinations coverage varied among regions, which ranged from 14% in Afar region to 87% in Addis Ababa (Figure 28); and have 73 percentage points absolute difference and ratio of 6.21 (from highest to lowest performing region).



Figure 26: Percent of children age 12-23 months vaccinated at any time before the survey; Ethiopia NHES2022/23

- Male and female children age 12-23 months were comparably equal (ratio of 1) in receiving all basic vaccinations (**Table 6**).
- The absolute difference between urban and rural residences' who received all basic vaccinations was 17 percentage points.



Figure 27: Percentage of children age 12-23 months received all basic vaccinations by region; Ethiopia NHES2022/23.

Table 6: Percent of children age 12-23 months received all basic vaccinations by sex, residence, age, education, and wealth; Ethiopia NHES2022/23

Equity stratifiers	Children age 12-23	Summary measure of
	months received all	inequality
G 6 1 3 1	Dasic vaccinations* (%)	
Sex of child	50	Detie (Males ferrels) 1
Male	59	Ratio (Male: female) =1
Female	58	
Residence		
Urban	68	Ratio (Urban: Rural) =1.32
Rural	51	
Mother's age		
15-19	56	
20-24	56	
25-29	60	Ratio (Highest: Lowest)
30-34	61	=1.1
35-39	57	
40-44	59	
45-49	58	
Mother's education		
No education	45	
Primary	64	
Secondary	72	Con-index=0.06(-0.07,
Higher	71	0.20); p: 0.3641
Wealth quantile		
Poorest	52	
Poor	62	
Middle	56	
Rich	60	Con-index = $0.12(-$
Richest	74	0.01,0.25); p: 0.0875
Total	60	

⁵ All basic vaccinations coverage for children age 12-23 months is the percentage of children age 12-23 months who received specific vaccines at any time before the survey (according to a vaccination card or the mother's report) in which a child must receive at least: one dose of BCG vaccine, three doses of DPT-HepB-Hib, three doses of polio vaccine, and one dose of measles vaccine.

3.5.3. Utilization of 3 doses of Pentavalent vaccination

The national coverage of 3 doses of pentavalent vaccines utilization for children age 12-23 months was 71% (Figure 29).



Figure 28: Percent of children age 12-23 months received 3 doses of pentavalent vaccination by region; Ethiopia NHES2022/23

Table 7: Percent of children age 12-23 months received 3 doses of Pentavalent vaccinations by sex, residence, age, education, and wealth; Ethiopia NHES2022/23

Equity stratifiers	Children age 12-23 months	Summary
	Pentavalent vaccine (%)	inequality
Sex	· · ·	
Male	71	Ratio (Male:
Female	71	Female) =1
Residence		
Urban	81	Ratio (Urban:
Rural	67	Rural) =1.20
Mother's age		
15-19	85	
20-24	68	Ratio (highest:
25-29	69	lowest) = 1.66
30-34	74	
35-39	73	
40-44	74	
45-49	51	
Mother's education		
No education	67	Concentration
Primary	70	index: 0.11(-0.01,
Secondary	82	0.22); p:0.0905
Higher	80	
Wealth quantile		
Poorest	59	
Poor	74	Concentration
Middle	67	index: 0.15 (0.03,
Rich	79	0.27); p: 0.0302
Richest	81	
Total	71	

- The percentage distribution of children age 12-23 months who received 3 doses of pentavalent vaccine was highest in Addis Ababa (96%) and lowest in Afar region (21%) (Figure 29), and the absolute difference between the two regions was 75 percentage points.
- The absolute difference between urban and rural residences, and highest and lowest performing mother's age groups were 14 and 34, percentage points, respectively.
- The positive concentration index (0.15) for receiving 3 doses of pentavalent vaccinations utilisation showed pentavalent vaccination coverage was significantly concentrated among the richest quintile (Table 7).

3.5.4. Three doses of Polio vaccine utilization coverage

4 In Ethiopia, 63% of children age 12-23 months received 3 doses of polio vaccination nationally.



Figure 29: Percentage of children age 12-23 months received 3 doses of Polio vaccinations by region; Ethiopia NHES2022/23

- Male and female children age 12 to 23 months comparably received equal three doses of polio immunization (ratio of 1).
- The concentration curve for receiving three doses of polio vaccinations utilization that lies below the line of equality and concentration index (0.14) indicated 3 doses polio vaccinations utilization was significantly concentrated among mothers with richest quintile (Figure 31).



Figure 30: Concentration curve of percentage of children age 12-23 months who received 3 doses of polio vaccination by wealth; Ethiopia NHES2022/23

Children age 12-23 months residing in urban areas received more 3 doses of polio vaccination than rural residents (ratio of 1.18), highest percentage in Addis Ababa and lowest percentage in Afar (ratio of 5.11), and highest with mother's age group 15-19 years and lowest with age group 45-49 years (ratio of 1.66). Table 8: Percentage of children age 12-23 months received 3 doses of Polio vaccinations by sex, residence, age, and education level; Ethiopia NHES2022/23

Equity stratifiers	Children received 3 doses of Polio vaccine (%)	Summary measure of inequality	
Sex of child			
Male	71	Ratio (Male:	
Female	71	Female) =1	
Residence			
Urban	80	Ratio (urban:	
Rural	68	rural) =1.18	
Mother's age			
15-19	85		
20-24	68	Ratio (highest:	
25-29	68	lowest) = 1.66	
30-34	75		
35-39	71		
40-44	74		
45-49	51		
Mother's education			
No education	68	Con-index:	
Primary	70	0.10(-0.01,0	
Secondary	81	.20); p: 0.0947	
Higher	80		
Total	63		

3.5.5. Three doses of Pneumococcal vaccinations

- Uverall, 70% of children age 12-23 months received three doses of pneumococcal vaccine nationally.
- The distribution of children age 12-23 in receiving 3 doses of pneumococcal vaccine varied from 20% in Afar to 96% in Addis Ababa. The absolute difference between the two regions was 76 percentage points and their ratio (Addis Ababa to Afar region) was 4.9.



Figure 31: Percent of children age 12-23 months received 3 doses of pneumococcal vaccinations by region; Ethiopia NHES2022/23



Figure 32: Concentration curve of children received 3 doses of pneumococcal vaccination by wealth; Ethiopia NHES2022/23

- The absolute difference between the urban and rural areas in receiving 3 doses of pneumococcal vaccination was 14 percentage points.
- The concentration curve for the percentage of 3 doses of pneumococcal vaccinations coverage that lies below the line of equality and concentration index showed the coverage was significantly concentrated among mothers with richest quintile (Figure 33).

Table 9: Percentage of children age 12-23 months received 3 doses of Pneumococcal vaccine by sex, residence, age, and education level; Ethiopia NHES2022/23

	Pneumococcal vaccine (%)	of inequality
Sex		
Male	70	Ratio (Male:
Female	70	Female) = 1
Residence		
Urban	80	Ratio (Urban:
Rural	66	Rural) =1.21
Mother's age		
15-19	85	
20-24	66	
25-29	68	Ratio (Highest:
30-34	72	Lowest) = 1.66
35-39	74	
40-44	74	
45-49	51	
Mother's education		
No education	67	Con-index: 0.10(-
Primary	68	0.01, 0.20); p:
Secondary	81	0.1130
Higher	79	
Total	70	

3.5.6. All age-appropriate vaccinations for age 12-23 months children

- In Ethiopia, 42% of children age 12-23 months received all age-appropriate vaccinations before the survey.
- It varied by region, ranging from 12% in Afar to 82% in Addis Ababa (**Figure 34**), their absolute difference and relative difference were 71 percentage points and ratio of 7, respectively.





Table 10: Percentage of children age 12-23 months received all age-appropriate vaccinations by sex, residence, age, education, and wealth; Ethiopia NHES2022/23

Equity stratifiers	All age-appropriate* vaccinations for children age 12-23 months (%)	Summary measure of inequality
Sex		
Male	42	Ratio (Male: Female)
Female	42	=1
Residence		
Urban	52	Ratio (urban: rural) =1.4
Rural	37	
Mother's age		
15-19	41	
20-24	34	Ratio (Highest: Lowest)
25-29	40	= 1.61
30-34	45	
35-39	46	
40-44	55	
45-49	48	
Mother's education		Mother's education
No education	43	
Primary	38	
Secondary	45	
Higher	49	
Wealth quantile		
Poorest	37	
Poor	41	Con-index: 0.10 (-
Middle	36	0.1,0.31);
Rich	39	p: 0.3485
Richest	58	
Total	42	

- Males and females, children age 12-23 months, comparably received all age-appropriate vaccinations equally (ratio of 1).
- The percentage of children age 12-23 months residing in urban areas was more than rural residents (52 percent versus 37 percent) in utilizing all age-appropriate vaccinations, and have 15 percentage points absolute difference.
- All age-appropriate vaccinations coverage of children age 12-23 was 61 percent higher among women in the age group 40-44 years compared with women under the age group 20-24 years (ratio of 1.61).
- All age-appropriate vaccinations coverage of children age 12-23 months was not significantly affected by mother's education level as well as by wealth index (Table 10).

3.6. CHILDHOOD MAJOR DISEASES ILLNESS AND MEDICAL TREATMENT SEEKING

3.6.1. Children with diarrhoea and medical treatment sought

- Eight percent of children under age five had a diarrhoeal episode in the 2 weeks before the survey.
- The prevalence of diarrhoea was 3 percent among children under age 6 months and 10% among those 6-11 months, when complimentary foods and other liquids were introduced. Prevalence remains high (11%) at age 12-23 months (Figure 35), which is the time when children begin walking and are at increased risk of contamination from the environment.



Figure 34: Percent of children under age 5 who had diarrhoea in the 2 weeks before the survey by child's age; Ethiopia NHES2022/23

- In Ethiopia, six out of ten children sought treatment for diarrhoea in the two weeks preceding the survey. The treatment sought magnitude for diarrhoea did not differ significantly by equity stratifiers such as mother's education, and wealth quintile, while regional variation was observed (Table 11; Figure 36).
- The treatment seeking behaviour for male children was greater than by 10% from the female children (ratio of 1.10), higher in urban than rural (ratio of 1.20), higher for <6 months children than 48-59 months children (ratio of 1.5) (**Table 11**), and more among mothers with higher education than uneducated mothers (ratio of 1.28).



Figure 35: Percent of children who sought medical treatment for diarrhoea by region; Ethiopia NHES2022/23

Table 11: Among children with diarrhoea in the 2 weeks before the survey, percentage for whom treatment was sought by age, sex, residence, mother's education, and wealth; Ethiopia NHES 2022/23

Equity stratifiers	Percentage of children	Summary measure of			
	for whom medical	inequality			
Child's ago in months					
	11S 77				
<0 6 11	60	Ratio (highest:			
12.23	00 66	lowest) = 1.5			
24-35	00 67	,			
24-33	07				
36-47	57				
48-59	51				
Sex					
Male	65	Ratio (Male: Female)			
Female	60	= 1.1			
Residence					
Urban	70	Ratio (urban: rural) =			
Rural	60	1.2			
Mother's education					
No education	56	Con-index: 0 13(- 08			
Primary	70	0.34): p:0.2583			
Secondary	66	ole 1), proi z e de			
Higher	72				
Wealth quintile					
Poorest	54				
Poor	58	C 1 0.19(
Middle	69	Con-index: 0.18(-0.10, 0.45), and 0.2217			
Rich	77	0.10, 0.45); p:0.2217			
Richest	73				
Total	62				

3.6.2. Children with Acute respiratory tract infection (ARTI) who sought medical treatment

- Nine percent of children under age five had symptoms of ARTI⁶ in the 2 weeks before the survey (Figure 37).
- Among children under age 5 who had acute respiratory tract infection (ARTI) symptom in the 2 weeks before the survey, advice/treatment was sought for 60% (Table 12).
- The treatment seeking for ARTI varied among regions, ranged from 51% in Dire Dawa to 90% in Afar region (Figure 38).

Table 12: Percentage for whom ARTI treatment was sought by child's age, child sex, residence, and mother's education; Ethiopia NHES2022/23

Background	Percentage of children with	Summary
characteristics	ARTI* for whom medical	measure of
	treatment was sought	inequality
Child's Age in n	nonths	
<6	25	
6-11	72	Ratio (Highest:
12-23	68	Lowest) = 2.87
24-35	65	
36-47	53	
48-59	62	
Sex		Datio (Mala/
Male	63	Kallo (Male/
Female	57	Female = 1.11
Residence		
Urban	72	Ratio(urban/Rural
Rural	55) =1.29
Mother's educat	tion	
No education	53	CI-0 14(05% CI)
Primary	67	0.001 0.274
Secondary	59	n:0.0732
Higher	87	p.0.0752
Total	60	

The concentration curve for the treatment seeking for ARTI symptom that lies below the line of equality and concentration index (0.05) indicated treatment seeking for ARTI was significantly concentrated among mothers with richest wealth quintile (Table 12; Figure 39).



Figure 36: Percent of children under age 5 who had ARTI in the 2 weeks before the survey by child's age; Ethiopia NHES2022/23



Figure 37: Percentage of children with ARTI who sought medical treatment by region; Ethiopia NHES2022/23



Figure 38: Concentration curve of treatment seeking for children under age five who had ARTI by wealth; Ethiopia NHES2022/23

⁶ ARTI suspected if there is cough accompanying with fast breathing and/or fever; but the child may or may not have nasal congestion or obstruction or sore throat or dysphonia or respiratory distress.

3.7: MICRONUTRENT SUPPLEMENTATION

3.7.1. Vitamin A supplements for children

- In Ethiopia, vitamin A supplementation among children age 6-35 months was 41% in the six months prior to the survey.
- The percentage distribution varied by child's age (ratio of 4.84), mother's age (ratio of 1.57), and residence (ratio of 1.38) (**Table 13**).
- Insignificant variation was demonstrated among mother's education level and as well as among wealth index in Vitamin A supplementation (Table 13).



Figure 39: Percent distribution of children age 6-35 months received vitamin A supplementation in six months prior to the survey by region; Ethiopia NHES2022/23

As indicated in Figure 40, the Vitamin A supplementation percent distribution varied from 24% in Afar to 74% in Addis Ababa, and their absolute difference was 50 percentage points. Table 13:Percentage of vitamin A supplementation for children age 6-35 months by age, sex, residence, region, education, and wealth; Ethiopia NHES2022/23

Equity Stratifiers	Percentage given vitamin A supplements	Summary measure of
	in past 6 months (%)	Inequality
Child's Age in months		
6-8	11	
9-11	21	Ratio (Highest:
12-17	50	Lowest) $=4.84$
24.25	54	
24-33 Mother's Age	54	
15-19	51	
20-24	40	
25-29	39	Ratio (Highest
30-34	45	Lowest) = 1.57
35-39	40	,
40-44	48	
45-49	33	
Sex of child		
Male	40	Ratio (Male:
Female	43	Female) =0.95
Residence		
Urban	52	Ratio (Urban:
Rural	37	Rural) =1.38
Mother's education		
No education	40	Concentration
Primary	39	index: 0.04(-
Secondary	48	0.06,0.15); p:
More than secondary	48	0.4362
Wealth quintile		
Poorest	38	Con indow.
Poor	39	0.11(-0.02.
Middle	37	0.24); p: 0.1384
Rich	44	
Richest	57	
Total	41	

3.7.2. Iron Supplementation during Pregnancy

- In Ethiopia, the overall coverage of Iron supplementation for 90+ days for recent birth pregnancy preceding the survey was 37%.
- The Iron supplementation coverage varied from 12% in Afar region to 60% in Harari region (**Figure 42**). The absolute difference between the two regions' coverage was 48 percentage points.
- In Figure 43, the concentration curves for Iron supplementation that lie below the line of equality and concentration indices showed Iron supplementation was significantly concentrated among women having higher educational level and among better-off wealth status.
- Iron supplementation was 20% higher among urban residents than rural residents (ratio of 1.2).



Figure 41: Percent distribution of women received Iron supplement for 90+ days during recent birth pregnancy by region; Ethiopia NHES2022/23



Figure 42: Concentration indices and curves of iron supplementation for 90+ days during recent birth pregnancy by maternal education and wealth; Ethiopia NHES2022/23.



Figure 40: Percent of women received Iron supplement for 90+days during recent birth pregnancy by age, residence, education, and wealth; Ethiopia NHES2022/23

3.8. HEALTH RESOURCES' AVAILABILITY AND ACCESSIBILITY

3.8.1. Community based health insurance (CBHI) coverage

- Overall, 51% of households enrolled in the community-based health insurance scheme in Ethiopia.
- Fifty nine percent of households enrolled in CBHI among rural and 29% among urban residences (Figure 44). The enrollment of CBHI among urban residence was 51% lower than rural (ratio of 0.49).



Figure 43: Percentage of households enrolled in CBHI by age, residence, education level, and wealth index; Ethiopia NHES2022/23

 The concentration curves for CBHI that lie above the line of equality and the negative concentration indices indicated CBHI enrollment was significantly concentrated among households with uneducated mothers' and among the poorest wealth quintile (Figure 46).



Figure 44: Percent distribution of households enrolled with CBHI by region; Ethiopia NHES2022/23



Figure 45: Concentration curves and indices of households' enrollment in CBHI scheme by education level and wealth; Ethiopia NHES 2022/23

3.8.2. Health facilities availability and accessibility

The minimum standard expected to serve number of people by each type of health facility/tier/ as it has been outlined in the Health Sector Transformation Plan-I (2015/16- 2019/20) for health service delivery arrangement: one health center provides services to approximately 25,000 people, one primary hospital to an average of 100,000 population, one general hospital serves to an average of 1,000,000 people, one specialized hospital/comprehensive hospital serves an average of five million people, and one health post serves to 5,000 people [11]. The distribution of each type of health facility to population ratio was done by dividing the total population by the total number of each type of health facility to see the coverage towards achieving at least the national minimum standard to serve certain population per each health facility type.

Table 14 shows the distribution of population per comprehensive hospital, general hospital, primary hospital, health center, and health post across regions. Regions such as Benishangul G., Gambela, and Dire-Dawa City Administration did not have comprehensive hospitals. Whereas, Harari, Addis Ababa, and Dire-Dawa did not have primary hospitals. The national average ratio of a comprehensive hospital to population was 1:3,105,641 with the highest in Harari region (ratio of 1:276, 424) and the lowest in Somali region (ratio of 1:6,506,240).

Overall, the average ratio of a general hospital to population was 1:1,155,587 in Ethiopia. The distribution was varied among regions with the highest in Dire-Dawa (ratio of 1:267,843) and the lowest in SNNPR (ratio of 1:2,285,871).

All regions showed the ratio of a primary hospital to population below the national minimum standard, and the national average ratio1:422,896. A primary hospital to population ratio ranging from the lowest in Oromiya region (ratio of 1:547,683) to the highest in Gambela region (ratio of 1:128,681). Whereas, the overall health center to population ratio was 1:27,744, ranging from the lowest in Addis Ababa (1:38,167) to the highest in Gambela (ratio of 1:18,383). Generally, the national average ratio of health post to population was 1:5,848 with the highest in Benishangul Gumuz region (ratio of 1:2,783) and the lowest in DireDawa city administration (ratio of 1:14,880).

Comprehensive **General Hospital Primary Hospital (PH)** Health Center (HC) Health Post (HP) Region Total population Hospital (CH) (**GH**) Numb CH: Population Numb **GH**: Population Number PH: Population Number HC: Population Number HP: Population er ratio ratio ratio ratio ratio er 2,033,172 1:1,016,586 96 344 1:5,910 Afar 0 0 2 5 1:406,634 1:21,179 1:2,859,671 1:346,627 876 1:26,116 1:6,399 22,877,366 8 15 66 3,575 Amhara 1:1,525,158 1:5,830 1:547,683 1425 1:28,057 1:4,997,605 Oromiya 39,980,837 8 39 1:1,025,150 73 6.858 1:6,506,240 1:542,187 221 1:29,440 1:4,566 6,506,240 5 12 1,425 Somali 1 1:1,301,248 1:2,783 Benishangu 1:301,258 60 1:20,084 433 1,205,032 1:602,516 0 0 2 4 1-G. **SNNPR** 1:2,285,871 1:318,959 483 1:28,396 2,769 1:4,953 13,715,224 1:3,428,806 6 43 4 28 1:18,383 1:3,120 1:128,681 Gambela 514,722 0 1:514,722 4 165 0 1 Harari 276,424 1:276,424 0 0 9 1:30,714 1:9,214 1 1 1:276,424 30 0 Addis 101 1:38,167 0 0 3,854,863 7 1:550695 6 1:642,477 0 Ababa Dire Dawa 535,685 0 2 1:267,843 0 0 16 1:33,480 36 1:14,880 0 4,569,339 2 1:2,284,670 1:1,142,335 1:240,492 137 1:33,353 1:8,293 Sidama 4 19 551 1:4,093 SW. 1:367,957 130 1:25,474 3,311,609 1:3,311,609 3 1:1,103,870 9 809 1 Ethiopia National 99,380,513 32 1:3,105,641 86 1:1,155,587 235 1:422,896 3,582 1:27,744 16,995 1:5,848

Table 14: Distribution of population per health facility type by region; Ethiopia NHES2022/23

3.8.3. Core Health Cadres Distribution

The health workforce is one of the major components for the improvement of national health care system. In the last two decades, Ministry of Health (MOH) has worked extensively to assure fair distribution of health workforce in each population segment (region) of the country that affect the equitable health service provision in the country. The core health cadres' availability rates (densities) were calculated from Zones/Sub-cities/Special woreda Health Departments data (2014 Ethiopian Fiscal Year data) to compare density equity and distribution among regions on selected core health workers which includes medical doctors (GP+=general practitioners plus specialists), nurses, and midwives. The result of 12 regions (except Tigray region) about core health workers densities have been presented in this report.

3.8.3.1. Density of core/frontline health workers and distribution

Overall, the density of total frontline health workers⁷ (the sum of physicians, nurses and midwives) was 8.5 per 10,000 population in Ethiopia with inequality distribution among regions. The absolute difference between the highest and the lowest density regions (**Figure 50**) was 26.1 rate points. The ratio from the highest density to the lowest density regions was 6.7, which indicating the frontline health workers density in Gambela was 6.7 times more than the density in Oromiya region.



Figure 46: Total frontline health workers (physicians + Nurses + midwives) density per 10000 population by region; Ethiopia NHES2022/23

⁷ Density of total frontline health workers is a rate of frontline/core health workers that the sum of core health workers such as medical doctors (GP+= general practitioners plus specialists), nurses, and midwives found in the specific geographic area divided by the number of population in the same geographic area, and multiplied by 10,000.

3.8.3.2. Density of medical doctors, nurses and midwives and distribution

- Overall, the frontline health workers rates/densities in Ethiopia for medical doctors (GP+ specialists), nurses and midwives per 10,000 population were 1.0,5.7 and 1.8, respectively and showed inequality across regions (Figure 51).
- The GP+ specialist density for Ethiopia (1.0 per 10,000 population) was lower than the HSTP -II target of 1.83 per 10,000 population and World Health Organization target of 44.5 per 10,000 population [12]. The inequality in density with the highest in Addis Ababa City Administration (8.0 per 10,000 population) and the lowest in Southwest Ethiopia (0.2 per 10,000 population), which indicated 7.8 rate points absolute difference between the two regions. The ratio from the highest density to the lowest density region was 40, which indicating physician density was 40 times more in Addis Ababa than in SW. Ethiopia.
- On the other hand, the nurses' density showed inequality with the highest density in Gambela region (27.1) and the lowest in Oromiya region (3.3) (Ratio of 8.3). The midwives' density also varied among regions with the highest in Somali region (4.4 per 10,000 population) which made 4.9 times higher than the lowest in Oromiya region (0.9 per 10,000 population).



Figure 47: Frontline health workers' (physicians', nurses' and midwives') densities per 10,000 population by region; Ethiopia NHES2022/23

4.SUMMARY OF A QUALITATIVE STUDY ON EQUITY IN HEALTHCARE SYSTEM

4.1. Equity in healthcare service availability and accessibility

Over the past three decades, Ethiopia has been committed to achieving universal access to healthcare, regardless of geographic and socio-economic disparities. The goal of "health for all" has been a top priority, as reflected in the Health Sector Transformation Plans- I & II of Ethiopia. Significant progress has been made in improving health accessibility through various initiatives, such as the expansion of health facilities, including health posts, and the implementation of the health extension program.

Despite these efforts and notable improvements made, the study participants acknowledge that access to health services remains an unfinished task. Various factors influence accessibility, including the level of socio-economic advancement, regional economic capacity, infrastructure limitations, population growth, and budget distribution. Developing regions face particular challenges in The study on healthcare equity in Ethiopia challenges reveals ongoing despite governmental commitment to "health for all." Disparities persist due to reasons related to socio-economic factors, regional economic imbalances, infrastructure limitations, and uneven budget distribution. Although maternal and child healthcare utilization has improved, variations remain due to demographic and socio-economic factors. Health resource concentration in urban areas limits access for rural and marginalized communities. Socioeconomic status continues to influence health disparities, particularly in maternal and child morbidity and mortality. Ethiopia's policies aim for a shift from universal to equitable and quality healthcare, but face challenges in regional implementation and financial constraints.

expanding health facilities and services due to limited resources and infrastructure. As a result, respondents indicated that the unique context of regions, including population density, distance, and geographical features, needs to be considered in budget distribution.

Differences in social services like education and roads create a big gap in healthcare access across regions and lifestyles. Rural and lowland areas face serious challenges—basic things like electricity and transportation are lacking, making it tough for health facilities to operate. On top of that, private sector involvement is mostly concentrated in urban and highland areas, making the healthcare gap even wider in rural places.

The study participants stress how important it is to tackle these issues and work towards fair healthcare. They're not just talking about a lofty goal; it's a must to make sure everyone gets good healthcare. They point out that using standardized methods to measure effective coverage is crucial, especially for maternal, neonatal, and child health.

"Health for all in all policies is one of the strategies or pillars. However, currently, there are both inter-regional and intra-regional (i.e., between urban and rural) disparities regarding access to health services in the country. There are still areas that have no access to health services. So, we think that health equity aims to narrow these gaps and improve access and that disparity will be fixed in the future." (Regional-102)

"Another reason is gender disparity. As you know, our country's culture of male dominance is still prominent, especially in rural areas, and when there is male dominance, there is a situation where women do not access health services as they wish. There are, for example, disabled members of society; usually our health organization was not made accessible to them, so there are others." (National-4)

4.2. Equity in maternal and child healthcare utilization

The study participants agree that there has been a notable improvement in the utilization of maternal and child health services in Ethiopia over time. Several factors have contributed to this progress, including the initiation of the health extension program and the expansion of health facilities, notably health posts staffed by health extension workers (HEWs). Strategies such as home visits, community engagement, and the active involvement of male stakeholders have collectively resulted in increased utilization of these services.

The government's proactive measures, such as providing maternal and child health services free of charge, have significantly bolstered utilization rates. Additionally, the implementation of health insurance and the engagement of non-governmental organizations have further contributed to the positive trajectory.

Despite these advancements, disparities persist in the demographic profile of service users. Geographical location, administrative region, occupation, and economic status all contribute to variations in service utilization. Individuals residing in rural areas encounter difficulties accessing healthcare facilities and educational institutions, resulting in lower service utilization compared to their urban counterparts. Furthermore, inadequacies in basic infrastructure in certain health facilities impede utilization rates.

The utilization of maternal and child health services is also influenced by cultural and socio-economic factors. Variations in religious beliefs and cultural practices impact the adoption of modern family planning methods. Factors such as conflict, instability, economic capacity, and disparities in leadership across administrative regions further contribute to disparities in service utilization. Peripheral and lowland regions exhibit lower utilization rates compared to central areas, underscoring inequalities in access to health facilities and resources.

In conclusion, Ethiopia has made commendable strides in advancing maternal and child health services. However, the persistent challenge lies in ensuring equitable access for all. Addressing this issue requires sustained efforts and targeted interventions, emphasizing the need for strategic and comprehensive approaches to rectify existing disparities.

"The particular reason for this dramatic progress is the insurance campaign. It is an opportunity to create awareness in our community since it is reaching every corner of the region. specialty services, for example, caesarean and delivery services have been started to be rendered at the level of health centers very recently, and CS is started in 45 health centers in our region which boosted the confidence of communities in health centers." (Regional-32)

"When we look at the infrastructure in health facilities, there is a very wide gap. Indeed, a study was conducted in this region in 2018. Most of the health facilities do not have the infrastructure, especially; water, toilets, telephone, and electricity, most of the health facilities do not fulfil this." (Regional-51) "We give education at schools about using reproductive health, planning and giving birth, and then they went looking for services. [This increased] the use of the service to its end, including giving birth in a health facility, postpartum services for enhancing growth and monitoring of their children, and taking vitamin 'A'. Similarly, the male partnership is another pillar. In addition to their education, the partnership between men, especially to prevent mother-to-child transmission of HIV; has its significant contribution to the program" (Regional-121)

4.3. Equity in health resource distribution

4.3.1. Equity in health facility distribution

Health equity is essential for a just society, but disparities in healthcare access persist in many developing countries. The distribution of health facilities, particularly primary healthcare centers, plays a significant role in health equity. Often, health facilities are concentrated in urban areas, leaving rural and marginalized communities with limited access to quality healthcare. This results in unequal access to care, perpetuating poverty and poor health.

According to the findings of the study, while some efforts have been made to expand services, there are still inequities, with developed regions receiving more attention than developing ones. The lack of diagnostic equipment and specialized services also contributes to the divide between the rich and the poor, as the latter cannot afford treatment in cities or abroad.

The historical system, economic constraints, and topographic differences are cited as reasons for the healthcare disparities. Some respondents suggest alternative solutions like telemedicine and preventive care to address the challenges. Understanding the interaction between geographic factors and contextual factors is crucial in addressing regional disparities. Recent security concerns have also affected healthcare accessibility in certain areas, requiring a re-evaluation of health facility distribution.

Overall, achieving health equity requires a comprehensive approach that addresses the root causes of disparities and ensures equal access to quality healthcare for all individuals, regardless of their location or economic status.

"Especially when we look at diagnostic institutes or the tertiary level, those people who need special services like special diagnostic, treatment, and services are not getting them. Only the rich go to the city or abroad for treatment. Since the poor farmers do not have the capacity, they are preparing themselves for death. So, there is a difference in the tire system and also in the service." (Regional-82)

"Opening a hospital requires many things, assigning experts, and equipping a laboratory. Then, people on beds should be seen and treated, but within a few distances, there is still a hospital where people are not being treated while lying down, so why are you opening another health facility?" (National-1)

4.3.2. Medical supplies and health facilities

The study participants highlighted the scarcity of basic amenities and medical supplies as a major concern in the country's health systems. There is an evident disparity in health facility and service availability between urban and rural areas. Urban

settings generally offer a broader range of advanced medical resources and services, while rural areas face systemic challenges with inadequate funding and a shortage of healthcare professionals.

In urban areas, most facilities have adequate medical equipment, but rural areas lack essential resources like ultrasound machines. However, some institutions have found ways to collaborate and provide mutual assistance, sharing resources, expertise, and knowledge to benefit all parties involved.

Despite the collaborative efforts, most respondents still noted a gap in equitable resource allocation. However, a few national respondents argued that the government is allocating resources based on demand and focusing on addressing social determinants of health. They are implementing programs to transform social determinants of health in certain districts and using them as models for others to learn from.

"Among the woredas/cities, for example, there is one place for medicine; DNS (Dextrose Normal Saline) is now in one place; Pharmacy. "This thing is here, if you want it, let's exchange medicine; if not, it will expire here." Subcities have this many connections. There are also situations where if someone has good experience, he takes the team and goes to other places to share." (Regional-12)

4.3.3. Equity in health workforce distribution

The availability and distribution of healthcare professionals significantly impact population health outcomes. Low-income and marginalized communities often face limited access to healthcare due to shortages of healthcare professionals in their areas, leading to disparities in health outcomes and preventable illnesses.

To address these disparities, a comprehensive approach is necessary, considering factors like the geographic distribution and mix of healthcare professionals, the quality of healthcare services in underserved areas, and the availability of resources to support professionals in such regions. There is a need to improve the distribution of the health workforce, which may involve providing financial incentives for healthcare professionals to work in underserved areas, expanding training programs, and utilizing technology for remote healthcare delivery.

Respondents identified several challenges in professional mix and speciality services, with certain areas having a scarcity of laboratory, pharmacy, and speciality professionals. Insecurity in some regions has led to the accumulation of specialists in urban settings, leaving rural areas with limited access to specialized care. Despite challenges, there have been positive changes, such as the introduction of human resource structures and increasing the number of health workers, including doctors assigned to health centers in regions where this was previously lacking.

"Overall, when we see it as a country, when we see it as a region, the equity in human resources and health centres is still unbalanced. We tried to do such an analysis as a region. In our case [our region] there are only 19 doctors; which is very small number, and this means one doctor serves 1000 people but our population is two million and our doctors can only serve 190,000 people. So, there is inequity and injustice regarding health professionals in the region." (Regional-122)

4.3.4. Equity in the implementation of CBHI and Healthcare financing

Ethiopia implemented a healthcare financing (HCF) strategy in 1998 to improve access to healthcare and introduced reforms, including revenue retention at health facility level, a payment subsidization system for the poor, and governance autonomy. However, not all reforms have been fully implemented or scaled up, leading to differences in HCF implementation across administrative regions.

Healthcare financing is crucial for reducing disparities in access to care and ensuring equal access for all, regardless of economic or social status. Health insurance, specifically community-based health insurance (CBHI), has been introduced to support the sick by the healthy and the poor by the wealthy, helping address health disparities.

Some regions, especially pastoralist and semi-pastoralist areas, have faced challenges in implementing HCF due to difficulties in contextualizing policies based on their specific conditions and slow institutionalization of the system.

Despite challenges, there have been successes in healthcare utilization and seeking behaviors due to CBHI, with increased attendance at health institutions. However, reimbursement issues pose a major challenge for CBHI schemes due to unclear policies, resource limitations, lack of infrastructure, and complex reimbursement processes. These challenges hinder the financial independence of health institutions and can affect the quality of care and satisfaction of insured clients. Overall, ensuring the equitable implementation of HCF reforms and addressing reimbursement challenges are essential for enhancing healthcare access and delivery in Ethiopia.

"With respect to community health insurance, it's deeply understood and accepted by the community as evidenced by an increment in OPD attendants and OPD per capital which was 0.7 before two years and now 1.25 which shows us how much health-seeking behaviour is growing. The interest of people to visit health institutions has been dramatically growing, that's due to health insurance ..." (Regional- 31)

"So, it's not effectively refunded by MoH and the regional health bureau. To strengthen the health care financing system and especially as mentioned earlier, the amount of money allocated to health facilities from the total resources is limited, especially the running cost, and the health care service is being cut down. Due to these all factors, the health care financing in the country/ the region is going down." (Regional-71)

4.3.5. Equity in the implementation of DHIS2 and CHIS

Ethiopia adopted DHIS2 as its nationwide health information system platform in 2016, aiming to integrate data from different regions and improve data collection and analysis. While DHIS2 has made significant progress, there are disparities in implementation across various regions, with urban facilities showing better implementation than rural ones due to factors like internet access and electricity.

The electronic community health information system (e-CHIS) is a high-priority initiative of the Ethiopian Ministry of Health, aiming to use technology and data to improve community-level health services. While e-CHIS has shown promise, its implementation varies across regions, with some regions showing good performance and commitment, while others lag behind, potentially due to the availability of resources and skilled manpower. Participants recognized the importance of

DHIS2 and e-CHIS in improving healthcare data and decision-making. However, the challenges of internet access, insecurity, and the lack of skilled manpower have hindered smooth implementation in some regions.

Addressing the disparities in DHIS2 and e-CHIS implementation is crucial to fully realize the potential of these systems in improving healthcare outcomes and ensuring access to quality healthcare for all communities across Ethiopia. Efforts to expand training, invest in technology and infrastructure, and increase commitment among health workers are essential to achieve this goal.

We launch CHIS, and e-CHIS are now available in a better way and now there is a better implementation. It is also placed first in the leadership lens. A task force was established to expand it well and I am a member of that task force. Good works are being done ... (National-2).

4.4. Equity in health outcomes; maternal and child morbidity and mortality

Ethiopia is striving to achieve universal health coverage (UHC) as part of the 2030 sustainable development goals, aiming for equal access to essential medical services without financial hardship. Despite notable improvements in public health over the past 20 years, health disparities based on socioeconomic status and household education level persist. There are significant differences in health outcomes between high and low-income families, with stunting and malnutrition more prevalent among poor families.

Ethiopia has made impressive progress in improving health outcomes and achieving most of the Millennium Development Goals (MDGs), but disparities still exist in maternal and child mortality across regions. There are geographical health inequalities with rural areas experiencing higher mortality rates. Contextual factors, such as climate and exposure to illness, influence the cause of maternal and child morbidity in different regions.

According to the study participants, various factors contribute to maternal and child morbidity and mortality, including shortages of specialized health workforce, infrastructure, and services. Delays in seeking appropriate medical help during obstetric emergencies also contribute to maternal deaths. Pneumonia and diarrhea are major killers of children under five years of age. The Ministry of Health is prioritizing efforts to address maternal and child health through health extension programs and primary healthcare.

Efforts to avert maternal and child mortality include establishing maternal waiting homes, implementing maternal death surveillance and review systems, increasing the health workforce, strengthening referral linkages, providing health education, and ensuring ambulance availability. Initiatives have been designed to address both supply and demand factors in maternal and child health care, such as improving blood supply, promoting health facility births, and implementing Integrated Management of Neonatal and Childhood Illness (IMNCI) programs.

Despite progress, challenges in healthcare infrastructure and workforce, as well as geographic and socioeconomic disparities, continue to impact maternal and child health outcomes in Ethiopia. Efforts to address these issues are ongoing to achieve equitable access to healthcare services for all communities.

4.5. Policies and strategies supporting health equity in Ethiopia: a move from universal access to equitable and quality services

Ethiopia has shifted its focus towards achieving equity and quality in healthcare, recognizing the disparities in health access across different regions and social strata. The Health Sector Development Plan (HSDP) has transitioned from a prevention-based and primary healthcare-focused approach to a more comprehensive strategy that addresses equity and quality. Initiatives have been introduced to improve healthcare in underserved and geographically marginal regions, such as mobile health care services, outreach programs, and special training for health workers.

According to the findings, special supports and initiatives, including subsidy financing and mixed criteria in resource allocation, aim to ensure equity in healthcare access. However, despite the national emphasis on equity, there are challenges in its implementation at sub-national and local levels. Limited capacity, inadequate resources, and weak monitoring and support systems have hindered the effective implementation of equity-related programs.

Variation between regions in implementing equity and quality strategies is evident, with some regions lagging behind and not fully implementing the plans. The Health Extension Program, which has made significant strides in enhancing healthcare access in rural areas, has shown limited impact in pastoral and urban areas due to security issues and infrastructure gaps. The lack of clear implementation strategies and contextualization at the local level further contribute to disparities in healthcare services.

Financial constraints have also posed challenges, as regions may lack the necessary funds to implement equity-related plans effectively. While efforts have been made to address health inequalities, there is still much work to be done at the regional and local levels to ensure equitable access to quality healthcare services across Ethiopia.

"Here is a success. One of the biggest is the equity strategy. The equity strategy first: the five components that I mentioned earlier are the ones that have not been tried in any other country and we have generated them in our country. For example; geography, socio-economic, gender, people with special needs and education." (National-3)

4.6. Actors and their engagement in health equity

The government of Ethiopia has adopted a multisectoral approach to address health equity issues, involving key stakeholders from various sectors, including health, agriculture, water, and education. Community engagement has played a crucial role in achieving universal health access and reducing child mortality. Supporting partners, both national and international, have provided financial and technical assistance to address health equity, especially in underserved and developing areas.

According to the study participants, while the engagement of multiple stakeholders has brought remarkable achievements, there are some challenges in coordination. The lack of a permanent coordinating body responsible for all stakeholders, including NGOs, funders, and public and private institutions, has been noted as a weakness. Additionally, the political

leadership in some regions and sectors has been perceived as weak, leading to limited achievements by the coordinating committee.

There is an uneven distribution of supporting partners across different regions and rural/urban areas. The number and type of interventions by supporting partners fluctuate based on global and national economic and political contexts. This unequal distribution is attributed to the lack of mapping and planning areas of intervention in the country, leading to an insufficient focus on areas with significant health equity problems.

Respondents highlighted that most supporting partners tend to focus on specific health issues like maternal and child health, HIV/AIDS, and humanitarian concerns, with less attention to addressing health system inequities. Some partners prioritize areas with better infrastructure, leading to a gap in implementing equity-related initiatives in underdeveloped regions lacking necessary infrastructure.

"The government can't do it alone. For example, providing income, building a health facility, and renovating, the support of partners is not easy in terms of compiling those who work with the community. In terms of strengthening the health sector, capacity building, and monitoring these supporting partners play a big role" (Regional-51)

"Most NGOs work on programs, but there is a very wide gap in terms of working on the health system or equity. Even those who are working on programs talk about equity in their project, but when they come, they prefer areas where there is a road. However, the problem is the issue of equity is in an environment where there is no such infrastructure. So, there is a wide gap in its implementation." (Regional-82)

4.7. Health equity structures in the healthcare system

The Ministry of Health in Ethiopia has established a dedicated directorate to address healthcare disparities and promote health equity. The directorate was set up in 2009 to reduce geographical disparities in healthcare provision, focusing on the four developing regions initially and later extending support to low-performing areas and pastoralist zones of agrarian regions. Its main objective is to provide essential resources and support, including equipment, financial aid, and technical expertise, to areas that need it the most, ensuring that all individuals have access to quality healthcare.

The directorate is part of the government's commitment to achieving health equity and bridging critical gaps in healthcare provision. It targets regions that are hard to reach due to geographical challenges, such as agrarian and pastoralist areas, to provide them with special support and resources. This directorate works collaboratively with local stakeholders to improve health systems and ensure that healthcare services reach every individual, regardless of their location.

However, the findings of this study revealed that there is variation between regions in the existence and functionality of structures supporting health equity-related tasks. Some regions have established equity directorates, while others may lack operational structures or face challenges in implementation. The study emphasizes the need to strengthen the equity structure at all levels, from the ministry level to the regional, zone, and district levels, to ensure the effective implementation of health equity strategies.

In response to the existing gaps and challenges, efforts are being made to restructure and improve the equity strategy. The creation of steering and technical committees is seen as a way to address these gaps and improve the functionality of the equity structure at different levels of the healthcare system. Overall, the dedicated directorate and the ongoing efforts to strengthen the equity structure demonstrate the government's commitment to promoting health equity and ensuring equitable access to healthcare services across the country.

"In some regions, there is a directorate of equity. In our region it is new, it is intended to be under Plan, Policy Program directorate as sub or is to be given additional work but so far, it is not operational, and it does not have its structure." (Regional-102)

4.8. Efforts to achieve health equity: Lessons from Ethiopia

Ethiopia has made significant progress in achieving health equity through the implementation of supportive policies and strategies. These policies recognize the diverse health needs of the population and aim to allocate resources accordingly to ensure access to healthcare for all. Key components of these policies include expanding healthcare facilities in underserved areas, improving maternal and child health, and increasing the number of trained healthcare professionals. As a result, Ethiopia has witnessed a reduction in maternal and child mortality rates and overall improvements in the health of the population.

The success of Ethiopia's equity strategy has become an inspiring example for other countries. The country has developed innovative approaches to healthcare delivery, such as mobile health services, which have been effective in providing essential healthcare to marginalized and hard-to-reach areas. Additionally, programs like the Ethiopian Primary Healthcare Alliance for Quality (EPAQ) and the health extension program have contributed to promoting health equity in the population by focusing on low resource utilization and community involvement.

The health extension program has been particularly successful in rural areas, where access to healthcare services is limited. The involvement of Women's Development groups and community-based health education programs has empowered mothers with knowledge and skills to make informed health decisions for themselves and their families. These programs have proven to be effective in improving health outcomes and empowering communities to take charge of their health.

Ethiopia's initiatives, such as the Sekota declaration, have garnered interest from neighbouring countries, seeking to learn from the country's experiences in promoting health equity. The country's commitment to providing equitable healthcare has positioned it as a role model for other nations to follow. By adopting similar strategies and focusing on community involvement and education, other countries can make significant strides towards achieving health equity and improving the well-being of their populations.

"Now, soon, the group from Somalia will enter Ethiopia to visit the works we have done in the Sekota declaration and, the Sudan group also have the plan to visit the work we have been doing at the Sekota declaration" (National-2).

5.CONCLUSION

Most of the indicators such as improved water source access, improved sanitation facility access, modern contraceptive use, receiving antenatal care four plus (ANC4+) visits, institutional delivery, skilled birth attendance (SBA), postnatal care (PNC) for mother and babies, Iron supplementation for pregnant women for 90+ days, and community-based health insurance (CBHI) enrollment show inequality by wealth, education, residence, region. The wealthiest and higher educated population groups benefitted more from utilizations of modern contraceptive use, ANC4+ visits, institutional delivery, SBA, PNC for mother and babies, and Iron supplementation services as compared to the poorest and uneducated population groups, respectively. There are inequalities among regions in improved water source access, improved sanitation facility access, ANC4+ visits, institutional delivery, SBA, PNC for both mothers/babies, all basic vaccinations, and all age-appropriate vaccinations interventions; Addis Ababa is the most advantaged City Administration from these interventions. All of the indicators indicate inequality between urban and rural population groups with disproportionately more in urban than in rural (except CBHI enrollment). However, male and female children reveal comparably equal utilization of all vaccines.

Qualitative study also showed that resources access, health care services access and utilizations, and outcomes varied among regions, residence, socioeconomic and demographic population groups due to variation by regions, socioeconomic status, cultural male dominancy, topography, urban-rural, health facilities and health workforce distributions, infrastructures, resource, awareness and budget disparities.

6.Recommendations:

- To ensure equity in health services utilizations increase community education and awareness, increase infrastructures, and alleviate budget disparities.
- Strengthen health equity regulations, policies and strategies implementations to narrow down inequity.
- Tailor interventions strategies to improve healthcare services accessibility and utilization focusing on poor performing regions, rural areas, far to reach areas and disadvantaged population groups.
- Promote and expand the CBHI and improve its utilization efficiency to all socioeconomic population groups, regions and urban/rural residences to ensure equitable quality healthcare access for all citizens without financial limitation.
- Alleviate financial resource limitation and expand health infrastructures to address unreached population.
- Strengthen the health workforce through human resource for health development, tailored motivation scheme & salary at lower health system/rural areas.
- Enhance multisectoral collaboration to improve social determinants, coordination and leadership commitment.
- It is important to have effective and continuous inequality monitoring system for regular monitoring and evaluating health performance inequality towards realizing health equity at all levels of the health system.

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ANNEX

Health focus	Key indicators	Indicator	Indicator numerator	Equity stratifiers
areas		denominator		used
Environmental	Access to improved	Number of	Number of households that use	Woman's age and
health related	water source	households assessed	improved water sources (piped	education, urban/rural
			water, tube well or borehole,	residence, region of
			protected well, protected spring, rain	the country; not
			water collection, tanker truck/cart	stratified by wealth
			with small tank, or bottled water)	because
	Access to improved	Number of	Number of households that have	water/sanitation are
	sanitation	households assessed	access to improved sanitation	part of the wealth
			sever system. Flush/pour flush to	IIIUCX
			sentic tank Flush/nour flush to pit	
			latrine Flush/pour flush-don't know	
			where Ventilated improved nit	
			(VIP) latrine or Pit latrine with slab	
			and composting toilet.	
Reproductive	Current use of any	Number of women	Number of women age 15–49 years.	Wealth, woman's age.
health	contraceptive method	age 15–49 years who	married or in-union, who are	woman's education,
	1	are currently married	currently using, or whose sexual	urban/rural residence,
		or in-union	partners are using any contraceptive	region of the country
			method	
	Current use of modern	Number of women	Number of women age 15–49 years,	
	contraceptive method	age 15–49 years who	married or in-union, who are	
		are currently married	currently using, or whose sexual	
		or in-union	partners are using modern	
			contraceptive method	xx7 1.1 1
Maternal	Antenatal care coverage	Women age 15-49	Percentage of women age 15–49	Wealth, woman's age,
health care	(at least one visit)	years, live birth in the	years who gave birth in the last five	woman's education,
		last 5 years, last born	standed at least one enteretal care	urban/rural residence,
		ciiiid	visit with a health worker during the	region of the country
			pregnancy of the last birth	
	Antenatal care coverage	Women age 15-49	Percentage of women age 15–49	
	(four or more visits)	vears, live birth in the	vears who gave birth in the last five	
		last 5 years, last born	vears prior to the survey and	
		child	attended at least four antenatal care	
			visits with a health worker during	
			the pregnancy of the last birth	
	Institutional delivery	All live recent births	Deliveries that occur in a health	
		in the last 5 years	facility	
	Births attended by	All number of	Number of women age 15–49 years	
	skilled health personnel	women age 15–49	who gave births in the last five years	
		years who gave births	prior to the survey and were	
		in the last five years	attended during delivery by skilled	
		prior to the survey	nealth personnel (doctor,	
			avtension worker)	
	Postnatal care for	Women age 15 /0	Women (15-49 years ald) who	1
	mothers in the first 48	who gave hirth in the	received a nostnatal check-up in the	
	hours	5 years preceding the	first two days after birth	
	10010	survey		
	Postnatal care for New-	Live-born babies in	New-born who received postnatal	1
	borns in the first 48	the 5 years preceding	check-up within 2 days of birth	
	hours	the survey		

Annex 1. List of key indicators with denominators, numerators and equity stratifiers

Child	BCG immunization	Live children, age	Children age 12-23 who received	
vaccinations	coverage	years preceding the	preceding the survey	
	All basic vaccination	survey	Children age 12 23 received * PCG	
	coverage for age 12-23	12-23 months in the 5	three doses of DPT-HepB-Hib, three	
	months	years preceding the	doses of oral polio vaccine	
		survey	(excluding polio vaccine given at	
			birth), and one dose of measles-	
	All age appropriate	Live children age	Children age 12 23 received BCG	Wealth maternal age
	vaccinations (full	12-23 months	three doses of DPT-HepB-Hib, four	and education.
	immunization coverage)		doses of oral polio vaccine, IPV,	urban/rural residence,
	for age 12-23 months		three doses of pneumococcal	region of the country,
			vaccine, two doses of rotavirus	sex of the child
			vaccine, and one dose of measies-	
	Three doses of	Live children, age	children age 12-23 who received 3	
	pentavalent vaccine	12-23 months	doses of (DPT-HEP.B-HIB	
	utilization coverage		(PENTAVALENT)	
	Three doses of Polio	Live children, 12-23	Children age 12-23 who received 3	
	coverage	monuns	doses of Pono vaccine	
	Pneumococcal 3 doses	Live children, 12-23	Children age 12-23 who received	
	immunization coverage	months	pneumococcal 3 doses vaccination	
Childhood	Prevalence of	Live children, 0-59	Number of children under age 5(0-	Wealth, maternal age
major diseases	diarrhoea	months	59 months) who had diarrhoea in the	and education,
	Prevalence of	Live children 0-59	Number of children under age 5(0-	region of the country.
	acute respiratory tract	months	59 months) who had pneumonia in	sex of the child
	infection (ARTI)		the 2 weeks before the survey	
Micronutrient	Vitamin A	Live children, 6-35	Received vitamin A in the past 6	Wealth, maternal age
Supplement	coverage	months	months preceding the survey	urban/rural residence
	es verage			region of the country,
				sex of the child
	Iron supplementation	Women aged 15-49	Received iron tablets during	Wealth, woman's age,
	during pregnancy	years	days)	woman's education,
			days)	region of the country
Health	Percent of households'	All households	Households enrolled in community-	Wealth, woman's age,
resources'	community-based health		based health insurance scheme	woman's education,
availability	insurance scheme			Sex of households'
anu	enronnent			residence region of
accessionity				the country
	Comprehensive hospital	Number of	Number of Specialized Hospitals per	
	rate/density at tertiary	population (all ages)	1,000,000 people (100x10000) in the	
	neatth care level	in the geographic	same geographic area (maximum standard by Ethionia health system)	
	General Hospital	Number of	Number of General Hospitals per	
	rate/density at secondary	population (all ages)	500,000 people (50x10000) in the	region of the country
	health care level	in the geographic	same geographic area (maximum	
	Drimony boolth sorra	area (specific region)	standard by Ethiopia health system)	
	facilities (HFs)	population (all ages)	hospitals, health centers and health	
	rate/density	in the geographic	posts) per 10,000 people in the	
	-	area	geographic area (minimum standard)	

No. of frontline health workers* density per 10,000 population (availability)	Number of population (all ages) in the geographic area (specific region) in 2014 Ethiopian fiscal year (EFY)	Absolute number of frontline health workers (professionals) and physical presence in the same geographic area (region) in 2014 EFY	region of the country
No. of medical doctors/nurses/midwives density per 10,000 population (availability)	Number of population (all ages) in the geographic area (specific region) in 2014 Ethiopian fiscal year (EFY)	Absolute number of medical doctors/nurses/midwives and physical presence in the same geographic area (region) in 2014 EFY	region of the country

*Frontline/core health workers include: general practitioners plus specialists, nurses, and midwives.