

Who Benefits from Public Spending on Health Care?

Longitudinal Evidence from Ethiopia

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WORLD BANK GROUP

Development Economics
Development Data Group
January 2026



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Abstract

This study investigates the distribution of benefits from public health care spending in Ethiopia by combining individual health care utilization data from the 2018/19 and 2021/22 waves of the Ethiopia Socioeconomic Panel Survey with regional budget information. It analyzes how health care subsidies and out-of-pocket expenditures are distributed across income groups and rural-urban settings. The results show that, although public health care use and subsidies are generally progressive, they tend to favor wealthier individuals. Further disaggregation by facility type and location over time provides deeper insight into these distributions. Hospital care subsidies are largely pro-rich, while benefits from health centers and posts are strongly pro-poor. Furthermore, rural residents face regressive out-of-pocket costs.

However, the longitudinal nature of the data allowed an assessment of temporal changes, showing recent improvement in pro-poorness at primary facilities. Subsidies at health centers and health posts demonstrated an increased pro-poor orientation between 2019 and 2022, which was particularly strong for outpatient and inpatient services in urban areas. The observed trends over time suggest potential to reduce disparities across all service types, including hospital care, through targeted approaches aimed at improving community access to these facilities. These findings have significant implications for equity in health care financing and inform policy priorities aimed at achieving universal health coverage in Ethiopia.

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Authorized for distribution by Talip Kilic, Senior Program Manager, Development Data Group, World Bank Group

JEL Codes: I38, I14, H51, H53

Keywords: Benefit incidence analysis, health inequality, public health care utilization, Universal Health Coverage, Ethiopia

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Acknowledgments: We gratefully acknowledge Nistha Sinha, Patrick Hoang-Vu Eozenou, and Wondimagegn Mesfin Tesfaye for their insightful feedback. Any remaining errors are our own.

1. Introduction

The Universal Health Coverage (UHC) target of the United Nations Sustainable Development Goals aims to improve health outcomes and reduce disparities by 2030. This includes access to safe, effective, quality, and affordable medicines and vaccines for all, while protecting against catastrophic out-of-pocket (OOP) and impoverishing health care costs (UN, 2015). However, the world is off track to achieving the target (WHO & WB, 2023). There exists a concerning disparity between who utilizes health care services and how public resources are allocated in many countries. The poor and people in rural areas tend to have lower access to health care services, benefit less from public health spending, and even spend a significant portion of their income to get health care services from public facilities (Peters et al., 2008; Qi et al., 2023). The gap can create a situation where health outcomes are often worse for those who need the most help and is more pronounced in low-income countries such as Ethiopia, where a larger share of health care resources go to the wealthier (Ambel et al., 2017; Hailu et al., 2021). In such countries, a greater share of OOP payments originates from wealthier individuals because they have a larger capacity to pay for health while the poorest often forgo care due to financial constraints. Consequently, when a disproportionate share of public resources supports services predominantly accessed by the better-off, the overall distribution of health service utilization becomes markedly regressive.

Over the last couple of decades, Ethiopia has seen upsurges in health care development, service utilization, and public spending. Public health care spending as a percent of GDP changed from 1.5% in 1995/96 to 2% in 2019/20 (MoH, 2022). Public health care spending represented 5.2% and 8.5% of the total government expenditure over those periods. Yet, the government financed only 32.2% of total health expenditure in 2019/20, with the rest covered by household OOP payments (30.5%), donors (33.9%), Community Based Health Insurance (CBHI) (0.9%) and others (2.5%) (MoH, 2022). This trend barely changed over the past decade. Ethiopia's health policy documents also emphasize equity. The first Health Sector Transformation Plan 2015/16–2019/20 (MoH, 2015) prioritized expanding health infrastructure and deploying health workers in rural areas. This was complemented by other enabling conditions, including the CBHI, a subsidized

insurance scheme and financial risk protection to the poor, which covered 34% of the population as of 2019/20 (MoH, 2022).

However, despite these efforts, health inequalities still exist in Ethiopia (Ambel et al., 2017; Bobo et al., 2017; Hailu et al., 2021; Woldemichael et al., 2019). For example, Hailu et al. (2021) find that public spending on hospitals and inpatient services is pro-rich while spending on health centers/posts and outpatient services slightly benefits the poor. Evidence from other developing countries shows mixed results (Bowser et al., 2019; Halasa et al., 2010; Khan et al., 2017; Malik & Ashraf, 2016; Mangham, 2006a; Mohanty et al., 2020; Onwujekwe et al., 2012; Samba et al., 2024; Vaughan et al., 2016; Wagstaff, 2012; Wagstaff et al., 2014). For instance, Bowser et al. (2019) find that utilization of India's public inpatient health care services is pro-poor for, but more equal and less pro-poor if benefits are considered. They also find pro-poor trends for outpatient gross and net benefits with significant locational differences. A finding from Malawi shows that hospital benefits are pro-rich, favoring women and urban residents, while health center benefits are pro-poor and favor rural dwellers (Mangham, 2006). These results might be due to differences in service quality between hospitals and other levels of care as well as country circumstances that can shape the distribution of benefits. Our study would thus inform current priority policies in Ethiopia's health sector.

The study investigates the distribution of health care utilization and benefits using recent longitudinal survey data and official budget data. It addresses the following questions: (1) How do health care utilization and subsidies differ between individuals of varying income levels and those living in rural versus urban areas? and (2) How have the recent distributions of health care utilization and public spending evolved?

We conduct a benefit incidence analysis (BIA) with 'benefit' referring to health service utilization and public subsidies an individual receives through utilization. The subsidies are net of any out-of-pocket expenditure paid to use a public facility's inpatient and outpatient health care services. BIA provides the distribution of both health care utilization and spending over a welfare measure (Malik & Ashraf, 2016; McIntyre & Ataguba, 2011; Wagstaff, 2012). The tool reveals whether health care provisions are pro-poor and evaluates the extent to which benefits match with the needs of health care service seekers.

We analyze individual level data from the Ethiopia Socioeconomic Panel Survey (ESPS) 2018/19 and 2021/22, combined with regional health care budget data from the Ministry of Finance (MoF) and the National Health Accounts (MoH, 2022). The ESPS provides individual level data on four types of public health care service utilization. These include (i) hospital outpatient, (ii) hospital inpatient, (iii) health center and health post (HCHP) outpatient, and (iv) health center inpatient. We first match visit frequencies and out-of-pocket health care payments with public spending data to ultimately estimate subsidies to individuals. We then conduct progressivity and pro-poorness analyses on utilization, out-of-pocket expenditures, and subsidies using concentration curves and concentration coefficients. Consumption expenditure per adult equivalent is used as a welfare measure.

Our analysis at the national level reveals that while public health care use and subsidies remain progressive over the years, they disproportionately favor wealthier individuals. However, this aggregate result at the national level masks significant variations. Specifically, subsidies for hospital care (both inpatient and outpatient) benefit the rich, whereas subsidies for outpatient and inpatient services at health centers and posts are strongly pro-poor. Moreover, rural residents face regressive out-of-pocket (OOP) health care costs. Notably, public health care subsidies became more pro-poor between 2019 and 2022, particularly for services at health centers/posts accessed by urban dwellers.

The study has two main contributions. Firstly, it uses longitudinal data and provides an in-depth service-facility and time disaggregated BIA of health care utilization and subsidies. We analyze the distribution with facility-service type combinations and focus on the recent dynamics. By assigning regionally disaggregated public health care recurrent spending to the same individuals seeking health care services (outpatient, inpatient) at public facilities (hospitals, health centers/posts) over two periods, we provide temporally comparable estimates. Secondly, by breaking down the analysis across various levels (including socioeconomic status, location, and region), this study pinpoints specific areas of significant health care inequality. This detailed analysis provides valuable insights for policy makers seeking to design targeted interventions to reduce disparities among these different groups.

The remainder of the study is organized as follows. Section 2 describes the methods and data employed. Section 3 presents the results and Section 4 discusses them. Finally, section 5 concludes.

2. Methods and data

2.1. Methods

The distribution of health care utilization and benefits from public spending is examined using a benefit incidence analysis. Following Wagstaff (2012), individual level subsidies or net benefits are defined as the difference between the gross benefits received and the OOP expenditures paid by the user. It is summarized as follows:

$$S_{ij} = B_{ij} - E_{ij} = b_{ij}q_{ij} - e_{ij}q_{ij} = q_{ij}(b_{ij} - e_{ij}) = s_{ij}q_{ij}$$

where S_{ij} are the subsidies or net benefits that individual i receives from using health care service type j such as hospital outpatient care; B_{ij} are the gross benefits received from service j by individual i (from the standpoint of the service provider, these represent the costs incurred); E_{ij} are the OOP expenditures paid by individual i to get service type j ; q_{ij} is the number of visits of service type j utilized by individual i ; and b_{ij} , e_{ij} and s_{ij} are the unit benefits/costs, unit OOP expenditures, and unit subsidies, respectively. As discussed below, OOP expenditures E_{ij} and utilization quantities q_{ij} are available at the individual level in the household survey data while B_{ij} come from the budget reports.

The study pursues what Wagstaff (2012) calls “constant unit cost assumption” where each health care service unit has an equal cost but a different amount of gross benefit and subsidy per unit of utilization. Empirically, we estimate health care gross benefits, unit costs and subsidies as follows.

- First, parameters for assigning public recurrent health care spending to facilities (hospitals and health centers/posts) and health care services (inpatient and outpatient) are identified from the latest National Health Accounts report (MoH, 2022). Given that these 2019/20 parameters can only be approximated for 2018/19, we assume that they remain unchanged in 2021/22.

- Second, using these parameters, each region's total recurrent spending for the survey years (2018/19 and 2021/22) is allocated to the four facility-service type combinations: hospital outpatient, hospital inpatient, health center/post outpatient, and health center inpatient. The federal government's recurrent health care spending is distributed among regions based on their share of public health care users.
- Third, the weighted total number of health care services per facility for each region is estimated from the household survey for both years 2018/19 and 2021/22.
- Fourth, dividing the regional spending by the total number of health care services per facility gives the unit benefit (b_{ij}), which is equivalent to the unit cost. Multiplying the unit benefit/cost by the number of visits that an individual makes to a health care facility for a specific service type (q_{ij}), which is directly available from the household survey, gives the gross benefits (B_{ij}) (McIntyre & Ataguba, 2011).
- Lastly, we estimate subsidies or net benefits (S_{ij}) as the difference between gross benefits and the OOP expenditure (E_{ij}) observed directly from the household survey. Subsidies to an individual are adjusted to zero if OOP expenditures exceed gross benefits (Wagstaff, 2012). In all facility-service type combinations considered, potential inequalities in subsidies are represented by differences in both utilization patterns and regional gross benefits/costs.

Health care service utilization rates in public facilities and the associated financial benefits received are distributed according to the socioeconomic status of the individuals who use the services. Consumption expenditure per adult equivalent measures socioeconomic status. Concentration curves and concentration coefficients are used to analyze the progressivity and pro-pooriness of health care visits, OOPs, and subsidies.

2.2. The data

This study relies on integrating two sources of data, official health care budget data and survey data. While budget data provide information on the amount of the subsidy by public health care service and facility type,

household survey data identify users and the intensity of use of health care services in public health care facilities. Health service utilization is measured in outpatient visits and inpatient stays at a health facility. From the survey data, four types of services are identified, namely, hospital outpatient, hospital inpatient, health center and health post outpatient, and health center inpatient.

Health budget data

The study uses budget data to extract recurrent health spendings of regions and the federal government for the 2018/19 and 2021/22 fiscal years, in line with the data available from the household survey. Recurrent health care spending at the federal level is assigned to regions according to their share of the total public health care users. However, budget data are not available by health facilities and service types. Parameters from the eighth National Health Accounts (NHA) report are used to assign recurrent expenditures to four types of public health care services: hospital outpatient, hospital inpatient, HCHP outpatient, and health center inpatient (MoH, 2022). Once the total number of visits for each of the health care services is computed from the household survey by region, unit costs of providing the services in each region are calculated.

Table 1 provides annual total and per visit recurrent public spending on health care services in 2019 and 2022 at the national level. Data from MoH (2022) show most of the recurrent health expenditure is allocated to outpatient services with 30.6% at hospitals and 26.4% at health centers or posts. Inpatient services received the rest, with 23.1% at hospitals and 19.9% at health centers. As it can be expected, in Ethiopia, where the number of hospitals and specialized health facilities is limited, the majority of annual health facility visits (approximately 80%) are made at health centers and health posts.

In terms of budget allocation, for each hospital outpatient visit, the government spent 1,174 ETB in 2019 and 958 ETB in 2022. A HCHP outpatient visit cost less, at 172 ETB in 2019 and 136 ETB in 2022 while a HCHP inpatient visit received the highest allocations in both years. All spendings per visit declined in 2022 mainly due to an increase in the number of people who visited health care facilities. Unit costs per visit differ by region (see Table A1 in the appendix). For example, in 2022, unit cost for a hospital outpatient visit ranged

from 571 ETB in Harari region to 2,020 ETB in Somalie region. The government's allocation to each HCHP outpatient visit varied between 92 ETB in Benishangul-Gumuz region to 757 ETB in Addis Ababa.

Table 1. Annual total and unit recurrent public spending on health, by facility and service type, over time

	2019		2022	
	ETB	%	ETB (in 2019 prices*)	%
Total annual recurrent spending				
Hospital outpatient	5,807,546,287	30.6	6,191,397,899	30.6
Hospital inpatient	4,381,131,410	23.1	4,670,703,678	23.1
HCHP outpatient	5,019,054,363	26.4	5,350,790,352	26.4
Health center inpatient	3,786,304,169	19.9	4,036,561,142	19.9
Total	18,994,036,229	100	20,249,453,072	100.0
Number of annual visits	Number	%	Number	%
Hospital outpatient	4,945,930	12.0	6,465,564	12.0
Hospital inpatient	4,849,099	11.8	5,348,469	10.0
HCHP outpatient	29,245,052	71.1	39,452,183	73.5
Health center inpatient	2,074,850	5.0	2,423,691	4.5
Total	41,114,931	100.0	53,689,907	100.0
Unit annual recurrent spending per visit	ETB		ETB (in 2019 prices*)	
Hospital outpatient	1,174		958	
Hospital inpatient	903		873	
HCHP outpatient	172		136	
Health center inpatient	1,825		1,665	

Notes: *The 2022 values are rebased to 2019 using consumer price indices of 2019 and 2022 (ESS, 2022).

Source: Authors' computation using data from ESPS 2018/19 and 2021/22, MoF, and MoH (2022).

Survey data

The survey data used come from the 2018/19 and 2021/22 Ethiopia Socioeconomic Panel Survey (ESPS). It is a nationally and regionally representative multi-topic household survey with several modules that collect socioeconomic, demographic, and various other information from individuals, households, and communities. In 2019, the survey interviewed 6,700 households and 29,503 individuals (CSA & WB, 2020). The follow-up in 2021/22 covered a total of 4,959 households and 25,374 individuals (ESS & WB, 2023).¹ The sample

¹In 2021/22, the survey was not implemented in Tigray region due to security issues.

used in this study consists of individuals who used any health care service, representing 7,723 individuals in 2018/19 and 7,214 individuals in 2021/22.

Table A2 in the appendix provides the descriptive statistics of selected variables for the whole sample of individuals and by health care use status. All the socio-demographic and education variables considered vary between 2019 and 2022 as well as between users and non-users of health care services. The proportion of females was 51% for the total sample in 2019 (50% in 2022) and higher among users of health care (54% in 2019 and 53% in 2022). About a quarter of the total sample comes from urban areas. However, this proportion is higher among users by over 10 percentage points compared with non-users, indicating a pro-urban distribution of health services. More individuals in the rich and richest quintile groups use health care services compared to those in the poor and poorest quintile groups, highlighting income-related health inequalities.

Assumptions

Missing values are treated as follows. Health facility visit information is available only for the previous 30 days. Similar facilities are assumed for 12 months. Similarly, when health facility information for an individual is unavailable, information from another household member is used if available. This approach assumes that members of the same household are likely to use similar facilities in the area. When no health facility information is collected for all household members, these assumptions are made: (1) Rural, inpatient, no OOP paid, CBHI covers costs: hospital visit; (2) Rural, inpatient, no OOP paid: health center visit; (3) Rural, inpatient, some OOP paid: hospital visit; (4) Rural, outpatient: HCHP visit; (5) Urban, inpatient: hospital visit; (6) Urban, outpatient, no OOP paid: health center visit; and (7) Urban, outpatient, some OOP paid: private clinic visit.

Furthermore, the ESPS dataset lacks health facility management details, so user-reported facility types were used for categorization: health centers and posts are public, clinics are private, and all hospitals are assumed public. This assumption has minimal impact since only 9% of hospital outpatient visits are to private hospitals,

which are mainly concentrated in a few urban centers. Most private outpatient services take place in widely available clinics.

3. Results

3.1. Utilization of health care services

Table 2 presents the overall as well as public and private health care utilization rates by type of services, location and over time. Overall, health service utilization is limited, 28.9% nationally² in 2022, higher in urban areas (32.5%) than in rural areas (27.9%). The national public health care utilization rate was 21.7% in 2022. A larger proportion of people in rural areas (23%) used public health care than those in urban areas (17%). Health center/post outpatient services constitute the largest share in both rural and urban settings. Urban residents use public and private health care services almost equally. In contrast, use of private health care is limited especially in rural areas, with the utilization rate in rural areas only a third of that in urban areas. Both total and public health service utilization rates improved in 2022 compared to 2019, with the majority driven by an improvement in utilization of health center/post outpatient care in rural areas.

Table 2. Health care service utilization rates (percent), by service and facility type and location, over time

	National		Rural		Urban	
	2019	2022	2019	2022	2019	2022
Used any health care service	25.1***	28.9	22.6***	27.9	32.5	32.5
Used public health care service	18.0***	21.7	18.1***	23.0	17.7	17.0
Hospital outpatient	1.8	2.2	1.1	1.4	3.6*	4.9
Hospital inpatient	1.5	1.6	1.2	1.4	2.5	2.5
Health center/post outpatient	14.0***	17.2	15.1***	19.5	10.7	9.0
Health center inpatient	0.8	0.7	0.7	0.7	0.8	0.6
Used private health care service	7.1	7.3	4.4	5.0	14.9	15.5
Private outpatient	6.5	6.8	3.9	4.5	14.2	15.0
Private inpatient	0.5	0.5	0.5	0.5	0.6	0.5

Notes: *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively. Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

² This utilization rate is slightly higher compared to that in 2013 (25.2%), and other East African countries such as Kenya (18.5%) and Uganda (23.1%) (Mwabu, 2022).

Among those who reported having used any health care service, there is a general trend of reliance on public health care services nationally and in rural areas from 2019 to 2022. Specifically, three-quarters visited public health care facilities (74.9%) in 2022, with most of them seeking HCHP outpatient services (59.4%) (Table 3). The remaining quarter of users sought health care services in private health care facilities (23.4% outpatient and 1.7% inpatient services in 2022). In rural areas, more than two-thirds of health care visits (69.7%) were made as HCHP outpatient visits. In contrast, in urban areas, private outpatient services dominated (46.2%) while HCHP outpatient care visits constituted less than one-third of the total (27.7%). Another notable finding is that HCHP outpatient visits showed a decrease in urban areas in 2022 (27.7%) compared to 2019 (33.1%), largely compensated by use of hospital outpatient care.

Table 3. Distribution of health care service and facility choices among users (percent), by location, over time

	National		Rural		Urban	
	2019	2022	2019	2022	2019	2022
Used public health care service	71.9	74.9	80.4	82.2	54.3	52.3
Hospital outpatient	7.0	7.6	5.0	5.2	11.1*	15.2
Hospital inpatient	6.0	5.6	5.2	5.0	7.7	7.6
Health center/post outpatient	55.9	59.4	67.0	69.7	33.1**	27.7
Health center inpatient	3.0	2.3	3.3	2.4	2.5	1.8
Used private health care service	28.1	25.1	19.6	17.8	45.7	47.7
Private outpatient	26.0	23.4	17.3	16.0	43.8	46.2
Private inpatient	2.2	1.7	2.3	1.8	1.9	1.5

Notes: *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Table 4 presents average per person annual number of visits to health facilities for outpatient and inpatient services by quintiles of expenditure per adult equivalent and over time. In 2022, the average number of outpatient visits per person was 0.20 at hospitals and 1.24 at HCHP. About three-quarters of the total health care visits were HCHP outpatient visits. At the national level, all types of visits showed no change between 2019 and 2022.

The annual number of health care visits is generally higher among the wealthier than the poor. A few differences are noted by type of facility and service. The richest, with 0.33 annual visits, had three times more outpatient hospital visits than the poorest (0.11) in 2022, with the national average being 0.20. This gap in

2022 also widened compared with that in 2019. In contrast, the poorest had slightly higher utilization of HCHP outpatient care than the richest in both 2019 and 2022.

Table 4. Average per person annual number of visits to health facilities by quintile and service type, over time

	2019					2022				
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total
National	0.21	0.21	1.24	0.09	1.75	0.20	0.17	1.24	0.08	1.68
Poorest	0.15	0.11	1.22	0.03	1.52	0.11	0.14	1.23	0.06	1.54
Poor	0.16*	0.16	1.21	0.08	1.61	0.07	0.15	1.25	0.07	1.53
Middle	0.16	0.23*	1.30	0.10	1.78	0.19	0.11	1.32	0.10	1.72
Rich	0.16	0.16	1.39	0.09	1.80	0.24	0.21	1.37	0.08	1.90
Richest	0.37	0.32	1.09	0.12	1.91	0.33	0.21	1.05	0.07	1.66

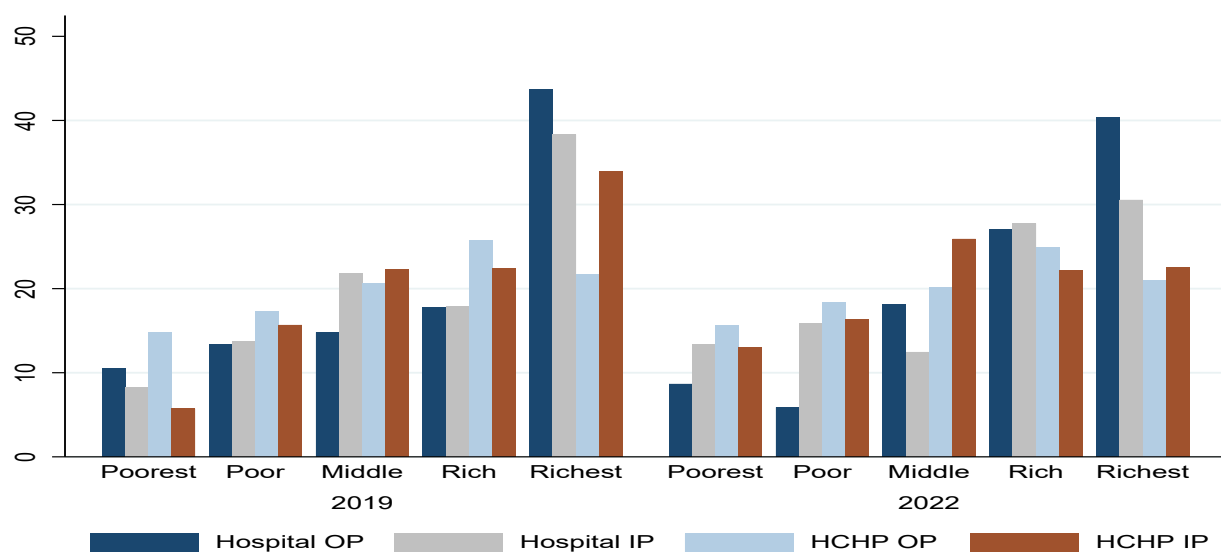
Notes: HO=Hospital; HCHP=Health center or health post; OP=Outpatient; IP=Inpatient. *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Utilization also varies by different characteristics and survey year (see Table A3 in the appendix). Hospital outpatient utilization was higher in urban areas while health center outpatient utilization was higher in rural areas during both years. This difference is also noted in mostly urbanized regions such as Addis Ababa, Dire Dawa and Harari where higher utilization of hospital-based services and lower utilization of health center services was evidenced.

The distribution of the share of utilization and concentration curves corroborate the distribution of average per-person visits presented above (Figures 1 and 2). Figure 1 presents the share of annual public health care service utilization from the total by quintiles. In 2022, the poorest 20% utilized 9% of total hospital outpatient, 13% of total hospital inpatient, 16% of total health center outpatient and 13% of health center inpatient services. Inpatient services use at both facilities by the poorest increased in 2022 compared with 2019. In 2022, the richest 20% used 40% of total hospital outpatient, 31% of total hospital inpatient, 21% of total health center outpatient and 22% of health center inpatient services. We also find that inpatient service utilization at both facilities by the wealthiest decreased in 2022 compared with 2019.

Figure 1. Share of annual public health care service utilization (%), by quintiles, service type, over time

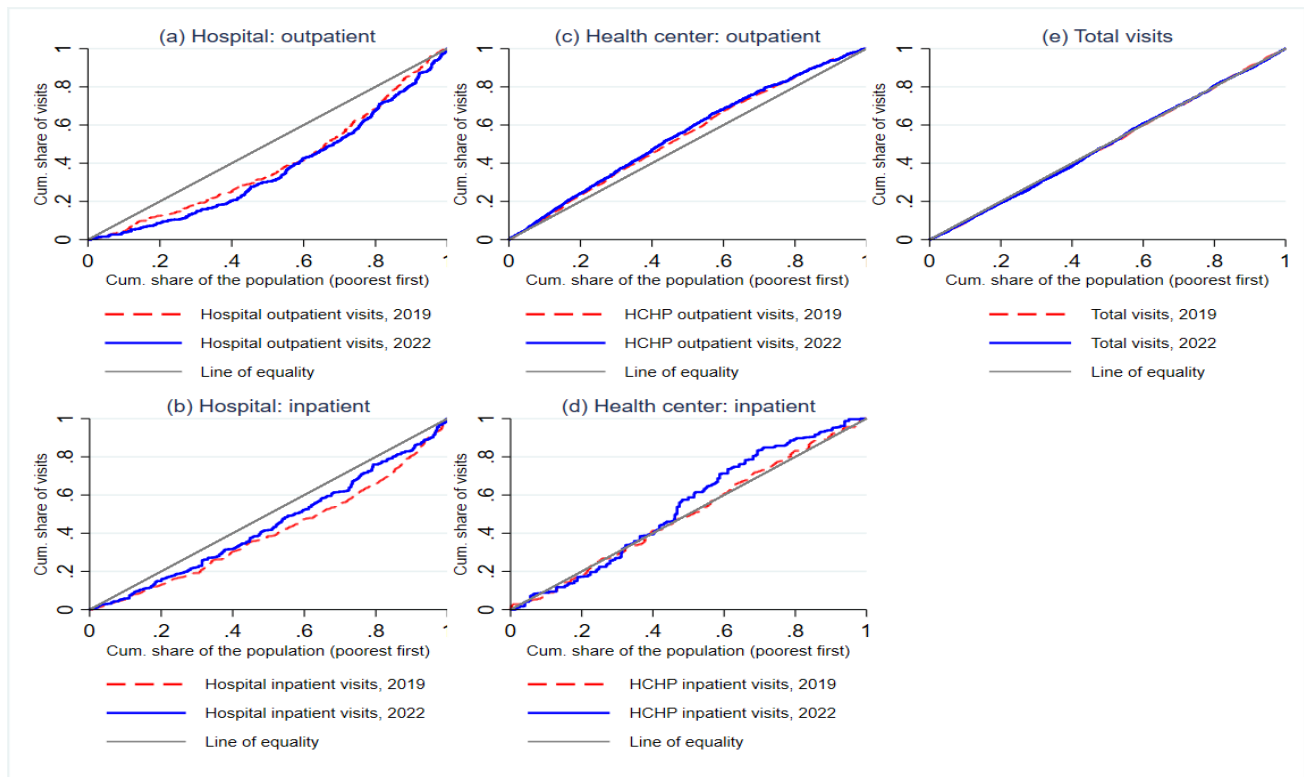


Notes: HCHP=Health center or health post; OP=Outpatient; IP=Inpatient.
 Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Concentration curves show that all types of annual health service utilization are progressive since all curves lie above the corresponding year's income Lorenz curve, though not reported for brevity (Figure 2). With regards to pro-poorness, we find that overall utilization of health care services is almost equalized between the rich and the poor, as evidenced by the concentration curves of total number of visits for both years (panel e). The distribution varies by service and facility type. Both hospital outpatient and inpatient services are pro-rich, as their curves lie below the line of equality.³ Use of hospital inpatient services appeared to be less pro-rich in 2022 than in 2019. Conversely, HCHP outpatient care is marginally pro-poor as its curves lie above the equality line. Moreover, use of inpatient admissions at health centers moved from being almost equalized in 2019 to being marginally pro-poor in 2022.

³The results reflect health care service use, not need-adjusted access or welfare gains. As noted in Commitment to Equity (Lustig, 2022), findings on pro-poorness should be interpreted cautiously if health needs are not considered. Pro-poor utilization and subsidies do not guarantee equitable access, since poorer individuals may have higher morbidity and require more care. Because we do not directly measure health needs, greater use or subsidies among the poor may indicate higher underlying need rather than preferential access.

Figure 2. Concentration of annual public health care use (number of visits), by service type, over time



Notes: HCHP=Health center or health post. All curves lie above the consumption Lorenz curve, not shown for brevity but can be available upon request.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

3.2. Health care out-of-pocket expenditures and subsidies

Out-of-pocket expenditures

In Ethiopia, some public health care services are offered for free or at low cost, while others involve higher but subsidized payments. Table 5 shows the average per person out-of-pocket (OOP) expenditure for public health care as a percentage of expenditure per capita (for the monetary values of the OOP expenditures, refer to Table A4). At the national level, the average OOP expenditure on health care at a public facility was 3.3% of expenditure per capita in 2019, which decreased to 2.4% in 2022. OOP expenditures by service types remained consistent between 2019 and 2022, except for expenditures on HCHP outpatient care.

An additional observation is that individuals with the lowest income incur the highest costs for public health care services relative to their income. In 2019, they spent 5.8% of their expenditure per capita on health care,

decreasing to 3.7% in 2022. In contrast, the wealthiest group devoted 2.4% in 2019 and 1.4% in 2022. This disparity is primarily attributed to higher utilization and consequent expenses at health centers and posts by the poorest compared to the wealthiest. OOP expenditures also vary by sociodemographic characteristics, residence and region (see Table A4 in the appendix).

Table 5. Average per person annual out-of-pocket expenditure on public health care as percent of expenditure per capita, across quintiles, by service type, over time

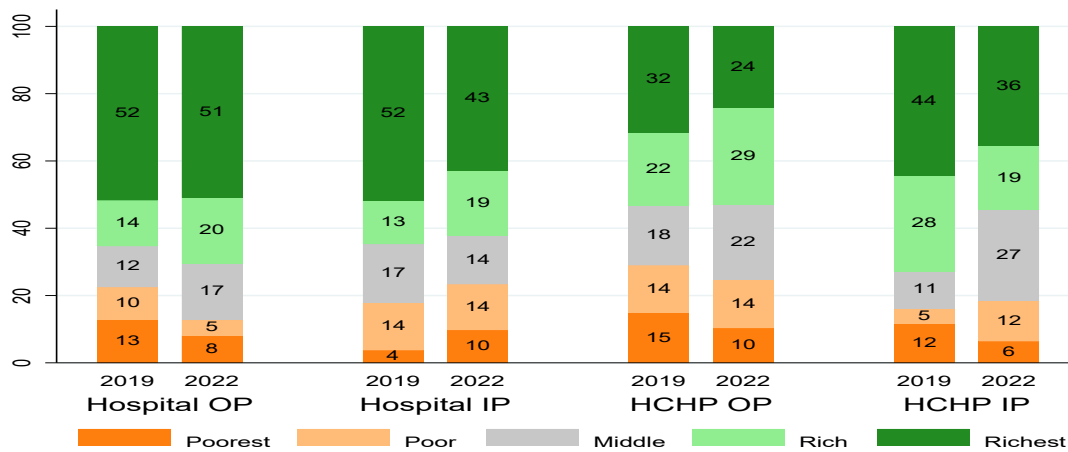
	2019					2022				
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total
National	0.6	1.0	1.5***	0.2	3.3***	0.4	0.8	1.0	0.2	2.4
Poorest	1.1	0.9	3.4**	0.3	5.8	0.5	1.3	1.7	0.2	3.7
Poor	0.6*	1.4	1.7**	0.1	3.8*	0.2	1.1	1.1	0.2	2.5
Middle	0.5	1.2	1.4	0.2	3.2	0.5	0.8	1.2	0.3	2.7
Rich	0.3	0.6	1.0	0.3	2.1	0.3	0.6	1.0	0.1	2.0
Richest	0.6	0.8	0.8**	0.2	2.4***	0.4	0.6	0.4	0.1	1.4

Notes: HO=Hospital; HCHP=Health center or health post; OP=Outpatient; IP=Inpatient. *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Figure 3 depicts per quintile share from the total annual OOP expenditures by service type and over time. Comparing the distributions in 2019 and 2022 indicates that hospital services remain mostly accessible to higher-income groups. Additionally, spending on hospital outpatient services by the lowest income group (bottom 20% of the income quintile) decreased from 13% in 2019 to 8% in 2022. A similar trend is observed for the poor income group, with spending on hospital outpatient services declining from 10% in 2019 to 5% in 2022.

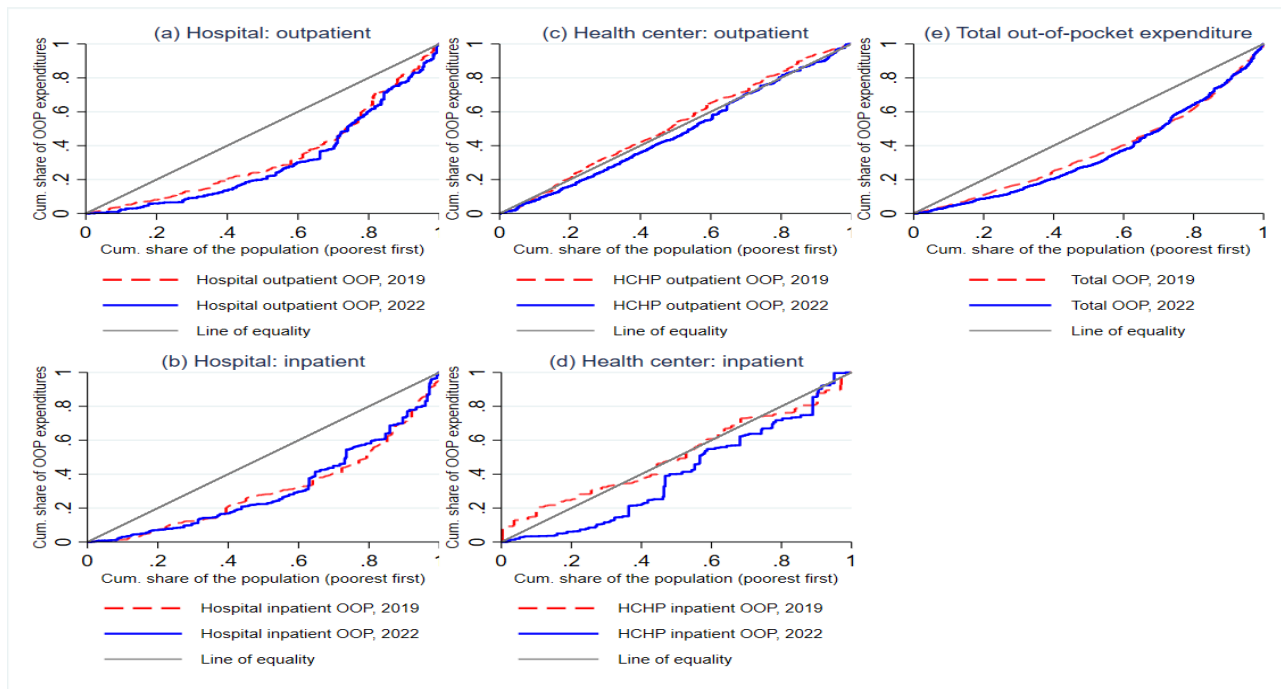
Figure 3. Shares of annual out-of-pocket public health care expenditures, by quintiles, service type, over time



Notes: HCHP=Health center or health post; OP=Outpatient; IP=Inpatient.
 Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

The concentration curve of total OOP expenditure on public health care depicted in Figure 4 indicates it is progressive during both years. However, regressive OOP health expenditures were noted in 2019 in urban areas for hospital outpatient care as well as in rural areas for health center inpatient admissions (see Table 6).

Figure 4. Concentration of OOP expenditure on public health care, by service type, over time



Notes: HCHP=Health center or health post. All curves lie above the consumption Lorenz curve, not shown for brevity but can be available upon request.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Table 6. Concentration coefficients of annual out-of-pocket expenditures on public health care and Gini index, by location and service type, over time

	2019						2022					
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	Gini coeff.	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	Gini coeff.
National	0.27	0.34	0.07	0.33	0.23	0.40	0.35	0.27	0.08	0.21	0.21	0.36
Rural	0.19	0.07	0.16	0.47	0.16	0.35	0.21	0.03	0.12	0.22	0.11	0.34
Urban	0.15	0.40	0.01	0.13	0.24	0.38	0.19	0.29	0.20	0.03	0.23	0.34

Notes: HO=Hospital; HCHP=Health center or health post; OP=Outpatient; IP=Inpatient. Concentration coefficients lower than the corresponding expenditure Gini coefficients imply progressiveness; if higher, regressiveness.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Subsidies

The incidence of annual subsidies, i.e., benefits net of OOPs, to public health care services as a percent of expenditure per capita is presented in Table 7. Total subsidies at the national level accounted for 2.9% of per capita consumption expenditure in 2022, reduced from 2019 which was 4.2%. By income group, most subsidies for the poorest and poor groups came from HCHP outpatient services during both years. Subsidies on health center inpatient stays largely reach the middle-income group. Another observation in Table 7 is that the distribution of subsidies over time shows a decline in subsidies as percent of expenditure per capita. This is particularly significant for hospital outpatient and HCHP outpatient services.

The monetary values of the subsidies by various population groups are presented in Table A5 of the appendix. People in urban areas are more subsidized overall and for all hospital services compared to those in rural areas during both years. In contrast, no differences in subsidies exist on HCHP outpatient and inpatient services.

Table 7. Incidence of annual public health care subsidies as percent of expenditure per capita, across quintiles, by service type, over time

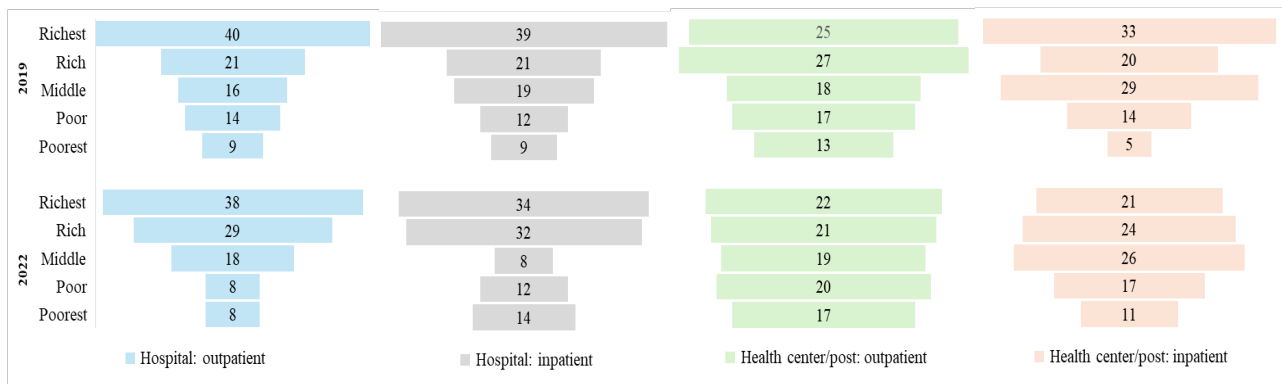
	2019					2022				
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total
National	1.3*	0.7	1.3***	0.9	4.2***	0.9	0.5	0.9	0.7	2.9
Poorest	2.2	1.3	2.9	0.5	6.9	1.1	1.1	2.2	0.8	5.2
Poor	1.5*	0.7	1.7**	1.2	5.2**	0.6	0.5	1.2	0.9	3.3
Middle	1.2	0.8**	1.1**	1.4	4.6**	1.0	0.2	0.8	1.0	3.0
Rich	1.0	0.6	0.9***	0.6	3.1	1.0	0.6	0.5	0.5	2.6
Richest	1.0	0.5	0.5***	0.6*	2.5***	0.6	0.3	0.3	0.3	1.5

Notes: HO=Hospital; HCHP=Health center or health post; OP=Outpatient; IP=Inpatient. *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Figure 5 illustrates the allocation of annual public health care subsidies across different income quintiles and service types. It provides a comparative analysis of the subsidy distributions over 2019 (upper panel) and 2022 (lower panel). Overall, subsidies in general go to the rich. For example, in 2022, the richest 20% received 38% of subsidies to hospital outpatient services compared to only 8% for the poorest 20%. The disparity is similar for most of the other services. However, over time, the distribution of subsidies slightly improved for all services except for hospital outpatient services. The improvement is more pronounced for subsidies to health center services.

Figure 5. Shares of annual public health care subsidies (%) by quintiles, service type, over time



Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

In terms of pro-poorness of subsidies, estimates show a pro-rich landscape for total health care subsidies at the national level. This finding is confirmed by positive concentration coefficients (Table 8) and concentration curves of total subsidies lying below the line of equality (Figure 6, and Figures A1 and A2 in the appendix). However, this pro-rich finding is not unanimous across health care service/facility types, location, and over time. Three observations stand out. First, subsidies to hospital outpatient and inpatient services are consistently pro-rich. This stays the same over time and across rural and urban subpopulations. Second, subsidies to HCHP outpatient and inpatient services improved from being largely pro-rich in 2019 to pro-poor in 2022 as concentration coefficients became negative. Third, in urban areas, subsidies on HCHP outpatient care and total subsidies became pro-poor in 2022 (see Table 8 and panel (e) of Figure A2 in the appendix).

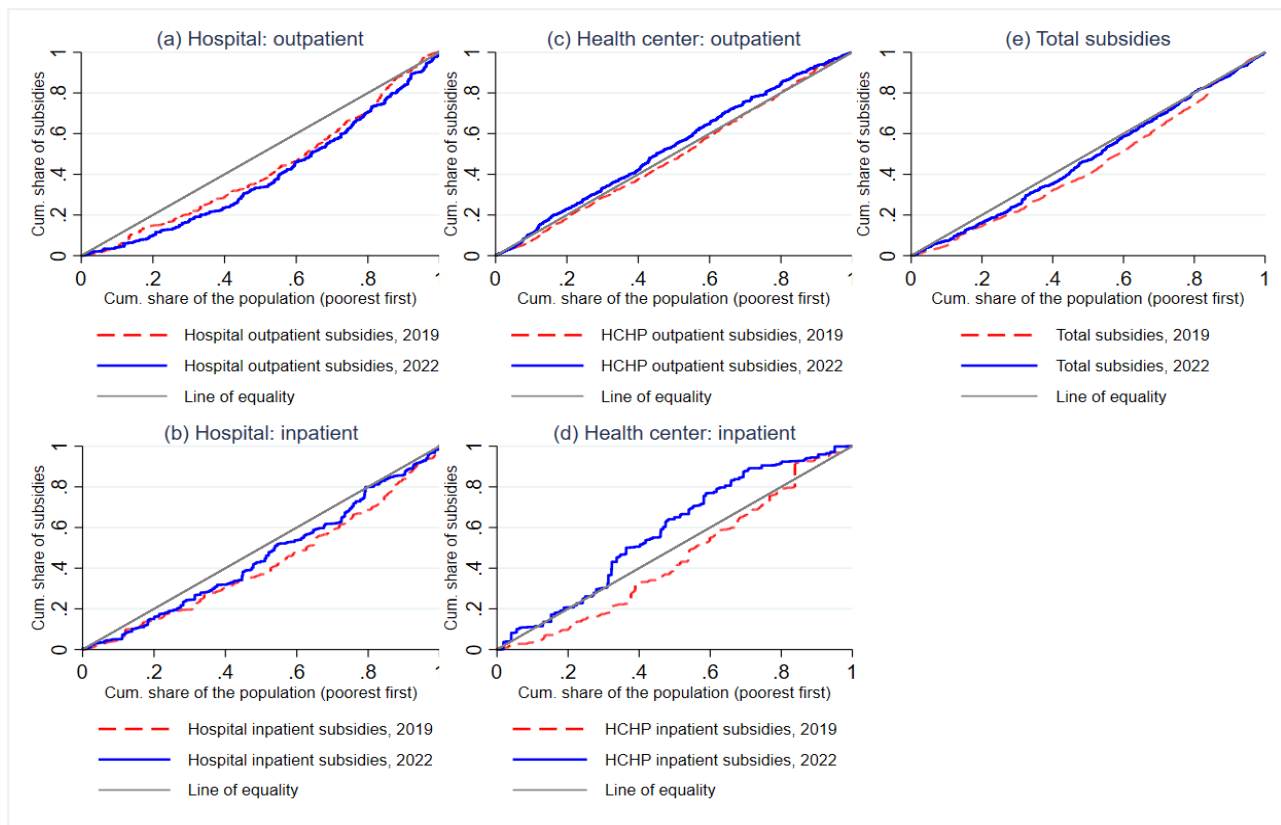
Table 8. Concentration coefficients of annual health care subsidies and Gini index, by population groups and service type, over time

	2019						2022					
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	Gini coeff.	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	Gini coeff.
National	0.20	0.21	0.03	0.15	0.15	0.4	0.25	0.18	-0.05	-0.01	0.10	0.36
Rural	0.04	0.15	0.06	0.23	0.12	0.35	0.22	0.14	-0.08	-0.02	0.06	0.34
Urban	0.10	0.22	0.02	-0.03	0.08	0.38	0.09	0.02	-0.03	-0.22	-0.02	0.34

Notes: HO=Hospital; HCHP=Health center or health post; OP=Outpatient; IP=Inpatient. Negative concentration coefficients imply pro-poorness; if positive, pro-richness. Concentration coefficients lower than the corresponding expenditure Gini coefficients imply progressiveness; if higher, regressiveness.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Figure 6. Concentration of annual health care subsidies (net benefits), by service type, over time



Notes: HCHP=Health center or health post. All curves lie above the consumption Lorenz curve, not shown for brevity but can be available upon request.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

4. Discussion

This study provided an analysis of inequalities in public health care utilization and spending benefits among different demographic and socioeconomic groups in Ethiopia by integrating longitudinal survey data with regionally disaggregated government expenditure on health care.

In terms of distribution, health care utilization remains lower compared to other developing countries, although there is an upward trend, particularly in rural areas. This shift will affect the benefit incidence analysis, as a static analysis cannot adequately explain household health care utilization behavior. As access to services improved and the user base increased, utilization tended to become more equitable. This suggests that policy should primarily focus on expanding the quality of care in regions where services are still limited.

On the one hand, overall health care utilization and subsidies are found to be progressive, i.e., the share of subsidies relative to income is higher for the poor. However, they remained largely pro-rich in absolute terms over the survey years, meaning wealthier groups received a larger share of the total subsidies to health care. This aligns broadly with previous studies in Ethiopia. For instance, Mesfin & Gao (2020) found public health spending to be progressive although it was not strongly pro-poor overall, implying the need to address structural barriers that constrain access to health care services by lower income groups.

On the other hand, aggregate national level estimates could mask important insights because access to health services, out-of-pocket expenses and subsidies vary significantly by location and facility type, among other things. For example, urban areas generally have more health facilities, while rural residents have fewer nearby options. Specialized hospitals and higher-level clinics are mostly located in the capital and a few urban centers, while health posts are rural based. Consequently, different facilities primarily serve different segments of the population.

By facility type, hospital-level services (both outpatient and inpatient) and their subsidies are pro-rich, while outpatient services from lower-level facilities (health centers and health posts) are pro-poor. Other studies also support this. For instance, Hailu et al. (2021) on Ethiopia, Mangham (2006) for Malawi and Samba et al.

(2024) for Senegal found benefits from hospitals to be pro-rich while those from health centers to be pro-poor. A systematic review of studies from various low- and middle-income countries also confirms these differences (Asante et al., 2016). However, not all variations can be due to differences in costs of services. Hospitals are also located closer to urban than rural residents, and urban residents on average have higher incomes and better insurance services.

Additionally, the results can vary over time because of improvements in coverage and scope of services (Croke, 2020). This is in particular relevant to a country like Ethiopia where structural constraints in accessing health care services weaken the effectiveness of cost-related measures. This study revealed the role of an improvement in scope and coverage of services over the 2019 and 2022 period in the more equitable distribution of subsidies that became more pro-poor. The improvement is for all groups but more pronounced for outpatient and inpatient care at lower-level facilities. This aligns with earlier research by Ambel et al. (2017), who also noted a reduction in the disparity between rich and poor regarding health care service utilization between 2000 and 2014. The observed trend toward increasing equality also resonates with findings from other Sub-Saharan African countries like Burkina Faso, Malawi, and Zambia, where studies have also observed improvements in the distributional incidence of health spending over time, potentially linked to Universal Health Coverage (UHC) reforms, although persistent geographical heterogeneities remain (Rudasingwa et al., 2020).

The study's findings on OOP expenditures, particularly the regressive nature of health center inpatient costs for rural residents, underscore the significant financial burden health care can impose. This connects with broader research highlighting high OOP payments in Ethiopia and their potential to cause catastrophic health expenditure (CHE). Recent studies confirm significant socioeconomic inequality in the financial hardship associated with health care in Ethiopia, with CHE incidence rates reported as high (Tadiwos et al., 2025). Factors like wealth status and lack of health insurance exacerbate this risk (Tadiwos et al., 2025; Tsega et al., 2025), also aligning with our study's implicit context where differential subsidy benefits translate to varying

OOP burdens. Regressive OOP payments are also common in other developing countries (Mills et al., 2012; Molla & Chi, 2017; Mtei et al., 2012).

This study has several limitations. First, BIA analysis does not consider differences in service quality between hospitals, health centers, and health posts across urban and rural areas or regions. Secondly, data regarding insurance reimbursement for health care services were not available from the survey and, therefore, could not be included in the analysis. Thirdly, the survey does not differentiate between public and private hospitals, which may overstate the apparent pro-rich bias of hospital subsidies, as users of private hospitals are typically wealthier. Finally, the study does not consider all aspects of health care utilization. Future research should aim to investigate inequalities related to gender, age, chronic illness, and insurance status to provide a comprehensive view of public expenditure within the context of health care utilization.

5. Conclusions

This study finds a complex pattern of health spending distribution in Ethiopia – progressive relative to income but favoring wealthier groups in absolute terms, particularly for services received from higher-level health facilities. This points to the role of structural barriers that prevent the lower income group from accessing health care services and benefits. These can tend to be more pro-poor as coverage expands and services become available closer to the communities. However, persistent pro-richness in hospital care, disadvantages faced by rural populations regarding OOP expenditures for certain services, and the broader context of high financial hardship risk and utilization inequalities emphasize the need for continued and targeted efforts. Addressing supply-side constraints, including infrastructure deficits, quality differences, and weak referral linkages, is essential for ensuring that current pro-poor spending patterns translate into equitable access and improved health outcomes. Moreover, strengthening primary health care, ensuring equitable resource allocation across facility types and regions, and expanding financial protection mechanisms (like health insurance) appear crucial for reducing inequality and moving toward universal health coverage.

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Appendix

Table A1. Annual total and unit recurrent public spending on health, by facility and service type and region, over time

Fiscal year	Region	Total health recurrent budget, current ETB				Spending/cost per visit in 2019 prices, ETB			
		Hospital outpatient	Hospital inpatient	Health center outpatient	Health center inpatient	Hospital outpatient	Hospital inpatient	Health center outpatient	Health center inpatient
2018/19	Tigray	392,543,390	296,129,224	339,247,681	255,923,690	950	619	160	1,171
	Afar	78,229,389	59,015,153	67,608,167	51,002,652	2,791	2,841	204	1,776
	Amhara	1,552,862,050	1,171,457,336	1,342,029,604	1,012,408,298	1,424	836	141	2,715
	Oromia	1,846,613,647	1,393,059,418	1,595,898,478	1,203,923,414	1,151	905	212	2,525
	Somalie	220,573,383	166,397,464	190,626,083	143,805,641	1,858	1,585	320	1,022
	Benishangul-Gumuz	126,223,582	95,221,299	109,086,176	82,293,080	1,552	1,638	248	792
	SNNP	827,718,112	624,418,926	715,338,629	539,641,422	907	836	95	883
	Gambella	37,644,713	28,398,643	32,533,682	24,542,953	1,766	2,602	225	2,145
	Harari	31,160,554	23,507,085	26,929,879	20,315,522	941	1,096	567	9,833
	Addis Ababa	622,298,689	469,453,397	537,809,050	405,715,599	1,063	1,093	575	3,913
	Dire Dawa	71,678,779	54,073,465	61,946,934	46,731,898	1,259	1,450	669	8,949
		Total/ average	5,807,546,287	4,381,131,410	5,019,054,363	3,786,304,169	1,174	903	172
2021/22	Tigray	-	-	-	-	-	-	-	-
	Afar	231,356,272	174,531,924	199,944,976	150,835,684	829	497	162	599
	Amhara	2,921,753,620	2,204,129,924	2,525,066,445	1,904,874,686	1,118	861	115	2,219
	Oromia	3,827,268,619	2,887,237,730	3,307,639,459	2,495,236,785	1,028	745	105	1,592
	Somalie	484,767,358	365,701,691	418,950,380	316,050,286	2,020	1,054	193	1,230
	Benishangul-Gumuz	208,812,318	157,525,082	180,461,821	136,137,865	1,237	1,366	92	906
	SNNP*	2,114,230,206	1,594,945,594	1,827,180,674	1,378,399,456	722	889	163	1,269
	Gambella	134,803,473	101,693,848	116,501,173	87,886,850	936	1,583	296	9,074
	Harari	57,553,241	43,417,357	49,739,224	37,522,572	571	1,164	527	3,529
	Addis Ababa	1,217,233,223	918,263,659	1,051,969,182	793,590,787	803	1,625	757	4,242
	Dire Dawa	131,354,118	99,091,703	113,520,139	85,637,999	1,121	1,227	410	1,511
		Total/ average	11,329,132,447	8,546,538,513	9,790,973,472	7,386,172,970	958	873	136

Notes: *SNNP (Southern Nations, Nationalities and Peoples region) includes Sidama and South West regions. The 2022 unit costs are rebased to 2019 prices using consumer price indices (ESS, 2022).

Source: Authors' computations based on data from ESPS 2018/19 and 2021/22, MoF, and MoH (2022).

Table A2. Descriptive statistics of individuals by health care use status, over time

Variable	All individuals				Users of health care services				Non-users of health care services			
	2019		2022		2019		2022		2019		2022	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Socio-demographics												
Female	0.51***	0.500	0.50	0.500	0.54	0.5000	0.53	0.499	0.50**	0.5000	0.48	0.500
Age	22.26***	17.899	24.15	17.931	26.85***	20.180	29.05	20.159	20.73***	16.790	22.15	16.530
Household size	5.83***	2.356	6.36	2.376	5.31***	2.250	6.12	2.337	6.00***	2.370	6.45	2.380
Urban	0.25***	0.435	0.22	0.412	0.33***	0.470	0.24	0.429	0.23*	0.420	0.21	0.400
Education												
Not educated	0.47	0.499	0.49	0.500	0.51***	0.500	0.47	0.499	0.46***	0.498	0.49	0.500
Primary	0.42***	0.493	0.38	0.486	0.36	0.480	0.38	0.486	0.43***	0.496	0.38	0.486
Secondary	0.09***	0.281	0.10	0.304	0.10**	0.296	0.12	0.320	0.08***	0.276	0.10	0.297
Above secondary	0.02***	0.152	0.03	0.170	0.03*	0.163	0.03	0.182	0.02**	0.148	0.03	0.165
Quintiles of expenditure												
Poorest	0.20	0.400	0.20	0.400	0.15	0.360	0.16	0.364	0.22	0.410	0.22	0.410
Poor	0.20	0.400	0.20	0.400	0.18	0.380	0.18	0.386	0.21	0.410	0.21	0.410
Middle	0.20	0.401	0.20	0.401	0.20	0.400	0.19	0.392	0.20	0.400	0.21	0.400
Rich	0.20	0.399	0.20	0.399	0.23	0.420	0.22	0.417	0.19	0.390	0.19	0.390
Richest	0.20	0.400	0.20	0.400	0.25	0.430	0.25	0.431	0.18	0.390	0.18	0.380

Notes: *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Table A3. Average per person annual number of visits to health facilities, by service type and population groups, over time

	2019					2022				
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total
National	0.21	0.21	1.24	0.09	1.75	0.20	0.17	1.24	0.08	1.68
Quintile										
Poorest	0.15	0.11	1.22	0.03	1.52	0.11	0.14	1.23	0.06	1.54
Poor	0.16*	0.16	1.21	0.08	1.61	0.07	0.15	1.25	0.07	1.53
Middle	0.16	0.23*	1.3	0.1	1.78	0.19	0.11	1.32	0.10	1.72
Rich	0.16	0.16	1.39	0.09	1.8	0.24	0.21	1.37	0.08	1.90
Richest	0.37	0.32	1.09	0.12	1.91	0.33	0.21	1.05	0.07	1.66
Residence										
Rural	0.14	0.18	1.43	0.09	1.83	0.12	0.14	1.39	0.07	1.73
Urban	0.34	0.27	0.86	0.09	1.56	0.45	0.26	0.75	0.09	1.55
Sex										
Female	0.20	0.24*	1.33	0.09	1.86	0.20	0.16	1.27	0.09	1.71
Male	0.23	0.17	1.13	0.08	1.61	0.21	0.18	1.20	0.06	1.65
Education										
No educ	0.19	0.23	1.41	0.09	1.92	0.20	0.20	1.37	0.09	1.87
Primary	0.25	0.20*	1.09	0.10	1.64	0.18	0.12	1.23	0.09	1.63
Secondary	0.31	0.33	0.84	0.07**	1.55	0.37	0.28	0.90	0.01	1.57
Tertiary	0.31	0.35	0.88	0.13	1.67	0.53	0.19	0.73	0.02	1.47
Region										
Tigray	0.28	0.33	1.44	0.15	2.2	-	-	-	-	-
Afar	0.11	0.08*	1.31	0.11	1.61	0.26	0.32	1.13	0.23	1.94
Amhara	0.18	0.23	1.56	0.06	2.04	0.18	0.17	1.49	0.06	1.90
Oromia	0.21	0.20	1.00*	0.06	1.48	0.15	0.15	1.24	0.06	1.61
Somalie	0.19	0.17	0.95	0.22	1.53	0.13	0.19	1.21	0.14	1.68
Benishangul-Gumuz	0.24	0.17	1.28	0.30	1.99	0.12	0.08	1.45	0.11	1.77
SNNP	0.15	0.13	1.27**	0.10	1.65	0.26	0.16	0.98	0.09	1.49
Gambella	0.16*	0.08	1.10	0.09*	1.43	0.34	0.15	0.93	0.02	1.45
Harari	0.54	0.35	0.78	0.03	1.71	0.70	0.26	0.65	0.07	1.68
Addis Ababa	0.57	0.42	0.91	0.10	1.99	0.83	0.31	0.76	0.10	2.01
Dire Dawa	0.56	0.37	0.92	0.05**	1.90	0.42	0.29	0.99	0.20	1.89

Notes: HO=Hospital; HCHP=Health center or health post; OP=Outpatient; IP=Inpatient. *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

Table A4. Annual out-of-pocket health expenditures (ETB), by service type and population groups, over time

	2019					2022				
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	HO: OP	HO: IP	HCHP: OP	HCHP: IP	To- tal
National	88	181	171*	45	484**	75	150	134	24	382
Quintile										
Poorest	75	45	169*	35	323	39	93	88	10	229
Poor	48	145	137	12	341	19	112	106	16	253
Middle	54	159	153	25	392	66	114	158	34	372
Rich	52	101	161	55	369	65	128	172	20	385
Richest	184	382	220**	81	867***	154	261	132	34	581
Residence										
Rural	63*	107	192	29	391	30	95	151	22	298
Urban	137*	333	127**	77*	674	215	320	82	27	644
Sex										
Female	70	186	168	61*	486**	67	134	144	19	364
Male	108	175	173**	26	482	83	168	124	29	404
Education										
No educ	92	175	233	33*	533	54	164	173	13	404
Primary	87	121**	155	34	396**	54	60	132	37	283
Secondary	141	502	86	154	884	232	383	80	2	697
Tertiary	224	775	127	288	1413	331	530	102	8	972
Region										
Tigray	47	192	79	18	336	-	-	-	-	-
Afar	87	183	357	86	713	49	366	410	43	867
Amhara	31	137	197**	12	377	33	134	104	4	275
Oromia	108*	141	170	8	427	41	90	135	20	286
Somalie	63	556	236	251	1107	103	536	277	201	1117
Benishangul-Gumuz	36**	110	161	84	391	13	84	161	20	278
SNNP	63	89	155	88	394	104	88	119	16	327
Gambella	48	88	126	39	301	83	105	139	55	383
Harari	270	607*	190	18	1084**	186	115	83	20	403
Addis Ababa	481	968	164	161	1774	703	1003	150	76	1931
Dire Dawa	315	738	169	6**	1227	165	468	145	93	870

Notes: The 2022 values are rebased to 2019 prices using consumer price indices of 2019 and 2022 (ESS, 2022). *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

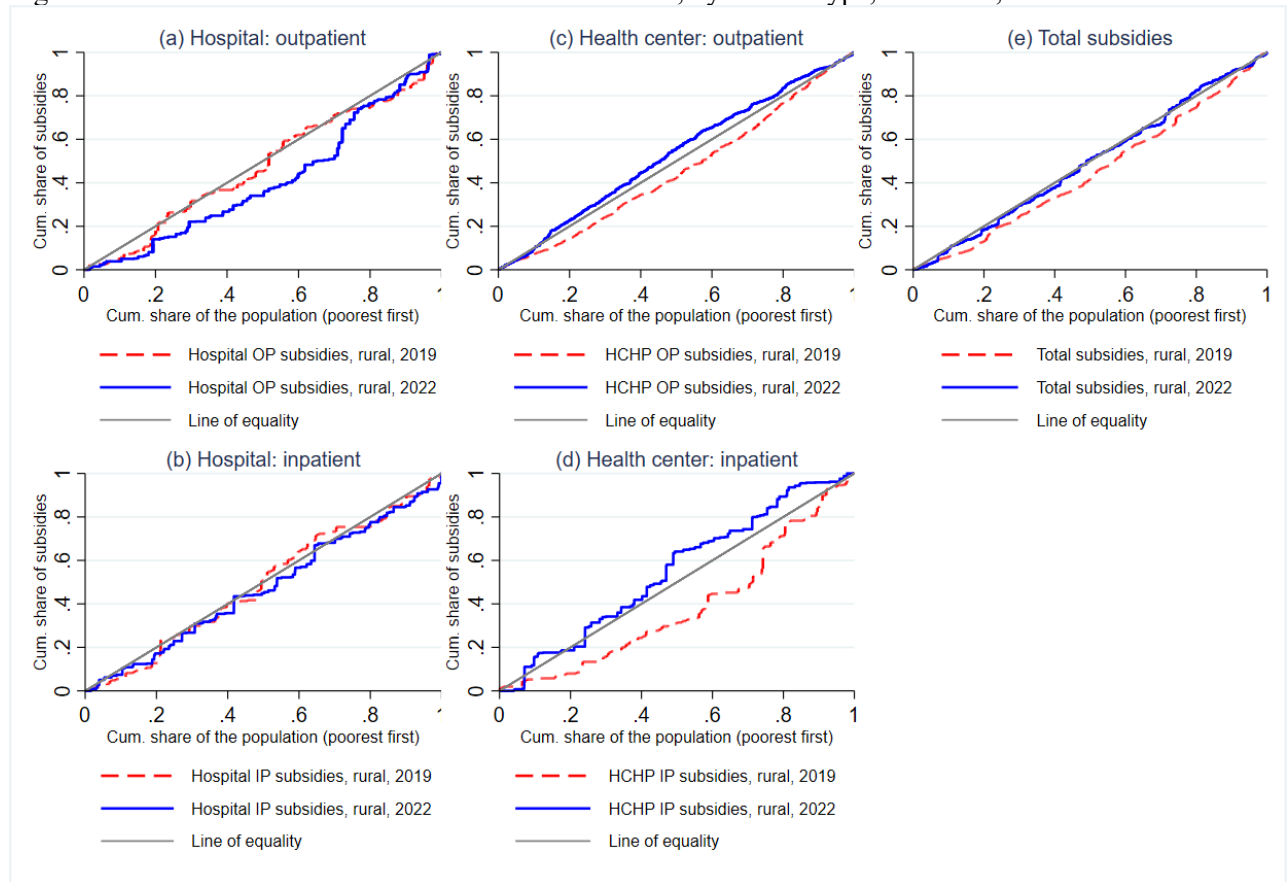
Table A5. Annual public health care subsidies (ETB), by service type and population groups, over time

	2019					2022				
	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total	HO: OP	HO: IP	HCHP: OP	HCHP: IP	Total
National	184	100	133***	134	552**	140	75	102	109	426
Quintile										
Poorest	109	60	115	42	325	67	65	113	78	324
Poor	145	68	128	108	448	59	50	114	102	325
Middle	153	96**	125	194	568	135	31	102	150	418
Rich	165	90	154***	115	525	179	108	96	117	501
Richest	302	160	137**	179	778***	214	104	92	93	503
Residence										
Rural	120	85	137***	131	473**	96	57	98	89	340
Urban	317	130	126	141	715	277	133	115	168	693
Sex										
Female	174	119**	149***	148	590**	137	68	104	141	450
Male	197	77	115	118	507*	143	83	100	72	398
Education										
No educ	154	108	141***	144	548	152	77	101	136	467
Primary	234**	112	111	160	618*	126	74	102	136	438
Secondary	244	142	110	95**	591	211	125	103	15	455
Tertiary	198	142	152	186	678	286	63	87	31	468
Region										
Tigray	221	128	180	160	689
Afar	226	134**	113**	130	603	174	28	64	95	362
Amhara	226	112	151*	155	643	168	82	118	125	493
Oromia	170	101	119**	152	543***	112	64	72	78	326
Somalie	299	119	181***	146	745	180	75	92	134	481
Benishangul-Gumuz	332*	189*	205***	188	914***	141	57	44	82	323
SNNP	95	52	60**	54	260*	112	69	96	108	385
Gambella	239	172	154	162	726	250	168	154	153	724
Harari	367	215	323	315	1221	294	237	296	239	1066
Addis Ababa	325	176	395	242	1138	345	208	458	360	1371
Dire Dawa	463	269	478*	458	1668	356	178	308	229	1071

Notes: The 2022 values are rebased to 2019 prices using consumer price indices of 2019 and 2022 (ESS, 2022). *, ** and *** show mean differences of 2022 and 2019 values are significant at 10%, 5% and 1% levels respectively.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22.

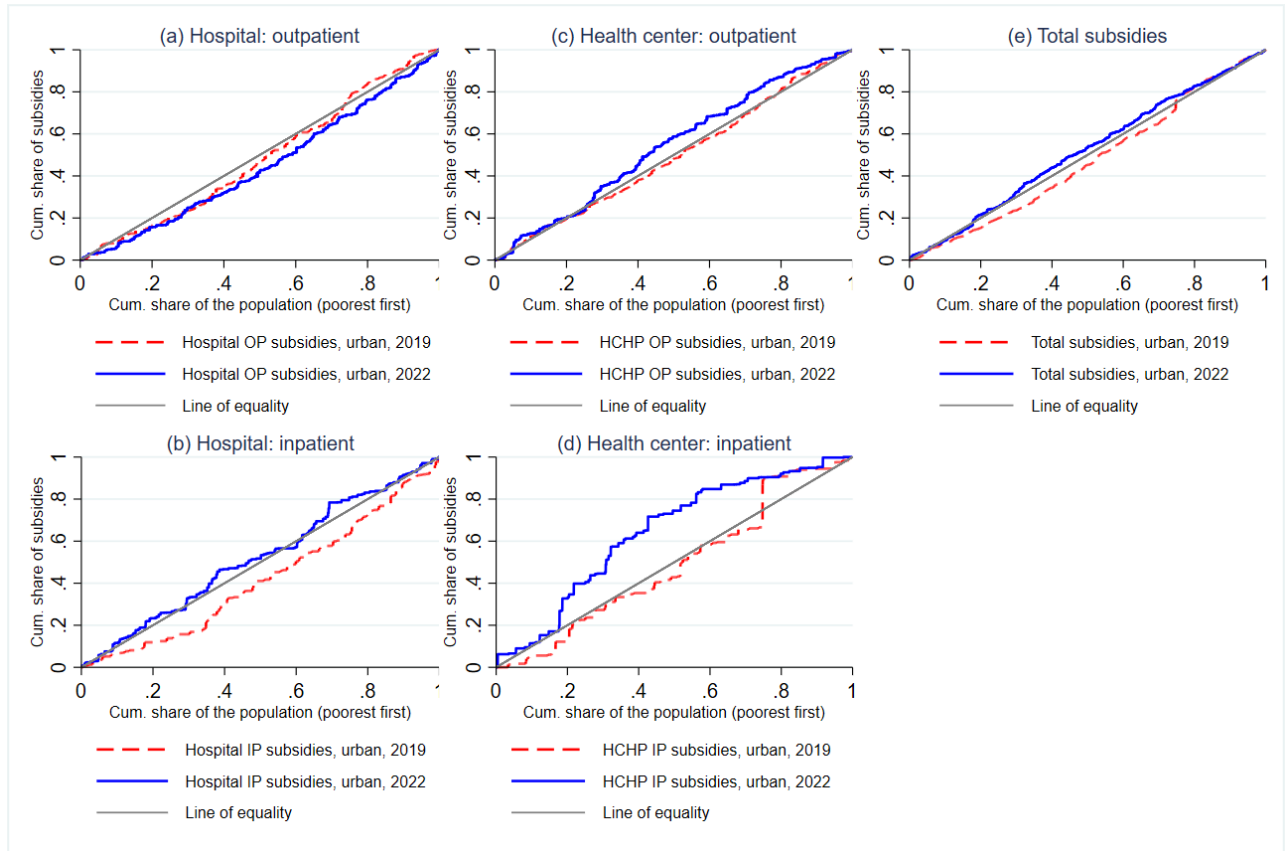
Figure A1. Concentration of annual health care subsidies, by service type, over time, rural



Notes: HCHP=Health center or health post. All curves lie above the consumption Lorenz curve, not shown for brevity but can be available upon request.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22

Figure A2. Concentration of annual health care subsidies, by service type, over time, urban



Notes: HCHP=Health center or health post. All curves lie above the consumption Lorenz curve, not shown for brevity but can be available upon request.

Source: Authors' computation using data from ESPS 2018/19 and 2021/22