

Quantifying Inequality in the Utilization of Healthcare Services Provided by Community-based Health Planning and Services and its Correlates in Selected Urban Poor Communities in Ghana: An Analytic Cross-Sectional Study, 2023

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Abstract

Background

Community-based Health Planning and Services (CHPS) was initially designed to address the healthcare needs of Ghana's rural communities. However, with urban population growth and the subsequent healthcare demands of the urban poor, the CHPS policy was extended to urban areas. There is a significant gap in our understanding of the wealth-related disparities, correlates, and utilization levels of healthcare services under the urban CHPS. This study is a pioneering effort to fill this gap, aiming to quantify the utilization level, identify correlates, and measure wealth-related inequality in healthcare services provided by the CHPS in poor urban settings.

Method

The survey was conducted in four poor urban communities in the Greater Accra Region of Ghana using a quantitative analytic cross-sectional survey design with multistage cluster sampling, ensuring a representative sample of 3543 respondents (97.9% response rate) in the 2070 households. We used the Erreygers and Wagstaff normalized concentration indices with cluster-robust standard errors to estimate the level of inequalities in service utilization. A negative binomial regression model with a delta-based cluster robust standard error was used to identify correlates of service utilization.

Results

Approximately 25.1% [95% CI: 23.2, 27.1] of respondents in the four urban-poor communities utilized healthcare services provided by community health officers (CHOs) via the urban CHPS concept. The Erreygers normalized concentration index (CI) of 0.129 ($p = 0.026$) showed that the utilization of healthcare services through the urban CHPS concept is significantly more concentrated among the rich or better-off sample households than among the poor households. The utilization of healthcare services provided by CHOs was 17.5% [95% CI: 14.01, 20.94; $p < .001$] greater among females than males and 12.0% [95% CI: 6.72, 17.21; $p < .001$] greater among rich individuals relative to poor individuals. The utilization of healthcare services was 13.3% [95% CI: 8.53, 18.02; $p < .001$] higher among persons living in slum households than those living in non-slum households.

Conclusion

Healthcare service utilization remains low, and disparities exist between the rich and the poor. These findings underscore the need to implement comprehensive, integrated targeted interventions with key stakeholder engagement to increase service utilization and address disparities in healthcare service utilization in poor urban settings.

Background

The United Nations projects that 68% of the world's population will reside in cities by 2050 [1]. Urbanization is frequently a driver of economic growth and can increase access to quality education, social protection, safe water, improved sanitation, electricity, good roads and health infrastructure, and better job opportunities and incomes. There is a perception of an urban advantage of improved health and overall quality of life; however, increased focus on the inadequacies of current data in representing poor urban residents and their health needs and outcomes highlights how these perceptions may not represent the reality of modern cities in low- and middle-income countries[2–5]. Recent studies have shown that urban settings can also lead to significant inequalities and health problems[6], including child health problems[5], emerging mental health issues [7], and non-communicable diseases such as diabetes, hypertension, and stroke [8, 9]. Consequently, the perception that urbanization is beneficial to human health is not always confirmed [10, 11].

Urban population growth over a short period of time may not correlate with the demand for health infrastructure or the provision of medical resources, which creates a “crowding effect” on city residents and adversely affects health [12]. Studies have revealed substantial disparities in the utilization of maternal health care among poor and nonpoor individuals in urban settings and slum localities, including inequality in maternal, neonatal, and child health outcomes and service utilization [13, 14].

Despite the renewed emphasis on strengthening primary health care globally to address health-related problems associated with rapid population growth in urban cities, the sector remains under-resourced across sub-Saharan Africa [15]. The observed trend and impact of urbanization are no different in Ghana, where urbanization has contributed to the formation of informal peri-urban settlements and slum communities. The lack of basic facilities, such as sanitation, clean water sources, and healthcare facilities, and poor referral systems for maternal and child health emergencies contribute significantly to increased infant and child mortality rates, the rapid spread of HIV and other STDs, unwanted teenage pregnancy, and unsafe abortions [16].

One major intervention that was introduced by Ghanaian policymakers to address the primary healthcare needs of its citizens was the introduction of Community-based Health Planning and Services (CHPS). To address persistent gaps and apparent disparities in access to and quality of health services in urban Ghana, the Ghana Health Service, with the support of the Ministry of Health, created Community-based Health Planning Services (CHPS) zones to provide local-level health services and health promotion, including reproductive, maternal, neonatal and child health services; treatment of diarrhea, malaria, and acute respiratory infection in children; comprehensive family planning (FP); and childhood immunizations and health outreach in urban settings.

The CHPS concept has been the foundation of Ghana's primary care system for more than two decades, using a combination of community-based health nurses, volunteers, and other relevant stakeholders of the health sector to provide universal access to basic curative care, health promotion, and prevention in rural communities [15]. As the Ghanaian population continues to urbanize, there is an urgent need to

adapt the CHPS model, which was originally designed for rural settings, to include urban areas. According to the 2016 Ghana Health Service Annual Report, more than 50% of the population in Ghana lives in urban settings, a number that has steadily increased over the last forty years and continues to increase each year.

Urban CHPS zones have a delivery model similar to the original CHPS concept. Each zone is a demarcated geographical area of a 4-kilometer radius and between 4500–5000 people, or 750 households in densely populated areas, and may be conterminous with electoral areas where feasible. Zones are staffed by trained community health officers (CHOs) and community health volunteers (CHVs), who support CHOs in educating communities on basic health issues and assisting with referral services and community social mobilization. CHPS services are delivered mainly through home visits, although treatment is provided for clients who come to the CHPS.

Although the Government of Ghana (GoG) declared CHPS a national priority in Ghana and adopted a national CHPS policy in 2016, there remains little evidence highlighting the extent of disparities, correlates, and utilization of healthcare services by urban-poor dwellers. To achieve the government's strategic goal of bridging the gap in healthcare access between the rich and the poor, there is a need to determine the level of utilization of healthcare services provided via the urban CHPS concept and to understand the factors that contribute to the utilization of these services. This is particularly important for assessing progress in reducing inequality in access to health services after the GoG adopted the national CHPS policy in 2016 and targeting relevant interventions to address existing gaps, if any. This study aimed to quantify the level of utilization and identify correlates of healthcare service utilization and inequality in healthcare services provided by the CHPS in poor urban settings in the Greater Accra Region of Ghana.

Methods

Study design

This study utilized an analytic cross-sectional survey design at the household level to generate a representative sample of poor urban dwellers who reside in different CHPS zones in four communities in the Greater Accra region of Ghana.

Study area

The study was conducted in four urban-poor communities in the Greater Accra Region of Ghana: Madina, Ashaiman, Nima, and Mamobi. All four districts have similar population dynamics, similar sociodemographic and economic indicators, and a greater number of slum households. The Madina neighborhood is a low-income community similar to other study areas because the other communities (Nima and Mamobi) emerged from Madina through a forced resettlement program to make space for a highway project in the 1970s [17].

Target population

Our sampled population included all men and women aged 18 years and above who reside in four poor urban communities and are supposed to benefit from the urban CHPS concept.

Eligibility criteria

Men and women aged 18 years and above who live in poor urban communities and are physically and mentally sound (free from any substantial physical or mental impairment that would prevent them from taking part) were interviewed. We excluded all those who met our inclusion criteria but were indiscriminate and not in the best state of health to answer the questions on the day of the interview.

Power analysis

Our power analysis for this study is based on a wider intervention study, and this survey is part of the baseline assessment to determine the level of utilization of healthcare services provided by the urban CHPS concept before the implementation of the intervention. In estimating the sample size for the larger intervention study, we assumed that approximately 50% of the urban poor would have access to and utilize services provided by the CHPS program (that is, visiting either the CHPS compound, outreach points, or CHOs visiting them in their respective households based on the CHPS zone concept), but the subsequent implementation of the intervention would increase access and utilization of health services by 6 percentage points. Assuming a type I error of 5% and a power of 80%, a nonresponse rate of 10%, and a cluster design effect of 1.5, similar to what was reported in the DHS, our estimated number of participants aged 18 years and above was 3620. To determine the total number of households needed to reach the sampled population of 3620, we assumed that 50% of the people in the household would be aged 18 years and above since the average household size in urban areas is estimated to be 3.5, and the total number of households required to reach 3620 people in the communities was 2070.

Sampling design

We used a multistage stratified cluster-sampling design. Initially, a comprehensive sampling frame of all the enumeration areas (EAs) was obtained from the Ghana Statistical Service. A household listing procedure was performed to update the sampling the sampling frame. We stratified our revised sampling frame by the four communities. A total of 69 EAs samples were randomly selected across the four communities (approximately 17 EAs per community using sampling probability proportional to the EA's measure of size, i.e., number of households). We selected 30 households within each enumeration area, similar to the sampling design of the demographic and household surveys, to yield the required number of 2070 households. The field data collectors were assigned to different EAs. Household members who met the inclusion criteria and lived within the randomly sampled households located in the sampled EA were interviewed.

Outcome measures

The primary outcome measure is the utilization of healthcare services provided by CHOs at the CHPS, at outreach points, and during home visits. This is a binary variable indicating whether the respondent had ever received healthcare services from CHOs assigned to a particular CHPS zone ("Have you or any member of the household ever benefitted from services provided by the community health officer that visited this household?"). The secondary outcome measures were awareness of CHPS/Outreach points for service delivery ("Are you aware of any Community Health-Based Planning Services compound (CHPS compound)"), outreach points such as churches and volunteers' homes and other places that community members visit located in this community where CHOs (nurses) provide services on specific days of the week?" and the intention to access and use services provided by the CHPS during CHO household visits or at outreach points ("Do you intend to access and use services provided by Community Health-Based Planning Services compound (CHPS compound), outreach points?"). All the outcome measures were binary indicators.

Covariates

The independent variables of interest included in this study were the respondent's sex, age in years, current marital status, educational level, employment status, religious affiliation, valid national health insurance card, household location (slum/non-slum), study location, household size, and household wealth.

The wealth index was constructed using the DHS procedure which is based on the ownership of certain household assets [18]. Using principal component analysis, a wealth index score was generated using a combination of the different asset indicators. Households with higher index scores are indicative of higher socioeconomic status and vice versa. We further categorized the respondents into five quintiles (poorest, poor, middle, rich, and richest) based on their estimated wealth index scores. Household wealth was recategorized into three groups (rich, moderate, and poor) for ease of interpretation and to aid understanding of the model output. We combined the poorest and poor categories as poor and rich and the richest categories as rich.

The UN-Habitat defines a slum household, in operational terms, as lacking one or more of the following indicators: a durable housing structure, access to clean water, access to improved sanitation, sufficient living space, and secure tenure [19].

Statistical analysis

Our statistical analysis was based on the following descriptive research questions.

First, what percentage of community members in poor urban settings 1) utilized services provided by CHOs under the CHPS program, 2) were aware of the services provided by CHOs through the CHPS program, and 3) reported their intention to use services provided by the CHWs through the CHPS concept?

Second, 1) how does the percentage of community members in poor urban settings that utilized services provided by CHOs under the CHPS program vary by respondent, age, marital status, educational level, employment status, religion, valid NHIS card status, location of household (slum versus non-slum), household size, household wealth, and community; and 2) how does the percentage reporting awareness of the services provided by CHWs through the CHPS program vary by the same characteristics; and 3) how does the percentage of community members that intend to use services provided by the CHWs through the CHPS concept vary by the same characteristics?

Third, what factors contribute to the utilization of healthcare services provided by community health officers? Fourth, are there inequalities in the healthcare service utilization provided by community health officers?

Our proposed statistical analytic technique was based on the recent framework for descriptive epidemiology [20, 21]. A complete case analysis was conducted as the overall proportion of missing observations was less than 3%. Descriptive summary measures were used to describe the study participants. Continuous variables are presented as the means (plus/minus standard deviation), while skewed variables are presented as medians (interquartile ranges). Prevalence estimates and other categorical indicators were expressed as numbers (proportions) with the estimation of the 95% logit-transformed CIs where appropriate [22].

We estimated the overall percentage of community members who utilized healthcare services provided by CHWs, the percentage of community members who were aware of the CHPS concept, and the intent to utilize services provided by the CHPS by first creating an intercept-only generalized linear model with a Bernoulli distribution and a logit link (logistic regression model) with household-specific cluster-robust standard errors using the delta method. We used the model predictions to compute percentages of the outcome measures and the corresponding 95% confidence intervals using post-estimation margin commands in Stata. The margin function provides the average of the model-predicted outcomes and the corresponding 95% CIs. We further stratified the level of service utilization estimates by background characteristics. A negative binomial regression model that reports prevalence ratios with cluster robust standard errors was used to assess the association between each categorical variable and covariate on the utilization of healthcare services provided by CHOs. For a cross-sectional study, the preferred effect size of interest is the prevalence ratio, not the odds ratio, because the odds ratio overestimates the effect size[23–26].

Two stages of statistical analysis were conducted to comprehensively assess inequality in the access to and utilization of health services provided by CHPs [27]. First, we used the Erreygers and Wagstaff normalized concentration indices [28, 29] with cluster-robust standard errors using household wealth (poor, moderate, and rich) as a ranking indicator to quantify the level of inequality and the F test statistic and the corresponding p values to test the null of equality in the concentration index across groups. Second, we compared wealth-related inequality in the utilization of health services provided by CHPs across slum and non-slum households, age distribution, gender (men and women), education (no

education, primary, senior high school, tertiary), religion (Christian, Muslims, others) and health insurance (valid versus invalid NHIS card). All the statistical analyses were conducted using Stata MP version 17 (StataCorp. 2021. Stata Statistical Software: Release 17. College Station, TX: StataCorp LLC), and p values less than .05 were considered to indicate statistical significance.

Results

Characteristics of the study participants

A total of 3543 participants were studied across the 4 communities. The average age was 47.7 years (SD = 14.6 years), and approximately 55% were females. Approximately 40% were classified as poor, and more than two-thirds (77.6%) of the respondents lived in slum areas with an average household size of 4. The detailed characteristics of the study participants can be found in Table 1.

Table 1
Characteristics of the study participants

	Frequency	Percentage
Sex of respondent (n = 3543)		
Male	1579	44.6
Female	1964	55.4
Age of respondent (n = 3529)		
Mean $\pm$ SD	47.7 $\pm$ 14.6	
< 25	451	12.8
25–29	474	13.4
30–39	941	26.7
40–49	693	19.6
$\geq$ 50	970	27.5
Marital Status (n = 3504)		
Never Married	1099	31.4
Currently Married/Cohabiting	1910	54.5
Previously Married	495	14.1
Educational level (n = 3530)		
None	575	16.3
Primary	464	13.1
JHS/JSS	960	27.2
SSS/SHS	1124	31.8
Tertiary	407	11.5
Employment Status (n = 3530)		
Unemployed	1095	30.9
Employed	2448	69.1
Religion (n = 3543)		
Christian	1995	56.3
LQ: Lower quartile; UQ: Upper quartile; SD: Standard deviation, NHIS: National Health Insurance Scheme. SSS/SHS: Senior secondary (high) schools		

	Frequency	Percentage
Sex of respondent (n = 3543)		
Muslim	1472	41.5
Other	76	2.1
Valid NHIS card (n = 3543)		
No	1419	40.1
Yes	2124	59.9
Location of households (n = 3543)		
Non-slum	794	22.4
Slum	2749	77.6
Household Size (n = 3533)		
Median (LQ, UQ)	4.0 (3.0, 6.0)	
< 5	2141	60.6
5–7	928	26.3
8+	464	13.1
Household wealth (n = 3303)		
Poor	1323	40.0
Middle	659	20.0
Rich	1321	40.0
Community (n = 3543)		
Ashaiman	816	23.0
Madina	868	24.5
Mamobi	963	27.2
Nima	896	25.3
LQ: Lower quartile; UQ: Upper quartile; SD: Standard deviation, NHIS: National Health Insurance Scheme. SSS/SHS: Senior secondary (high) schools		

The level of awareness of the CHPS concept and the intention to access and utilize healthcare services provided by CHOs

Our study revealed that 54.0% [95% CI: 52.1 to 56.0] were aware of the urban CHPS concept, and 49.5% [95% CI:47.6 to 51.4] had never utilized healthcare services provided by CHOs intended to access and use services in the future. Approximately 25.1% [95% CI: 23.0, 27.3] of respondents received and benefitted from health services provided by CHOs at the CHPS compound or outreach points via the urban CHPS concept (Table 2)

Table 2

Awareness of CHPS/Outreach points and intentions to access and utilize healthcare services provided by the CHPS.

	Awareness of CHPS/Outreach points n = 3543	Intention to access and use services provided by CHPS. n = 3543	Ever received or utilized healthcare services provided by CHOs at the CHPS compound or outreach points. n = 1914
	% [95% CI]	% [95% CI]	% [95% CI]
Overall	54.02 [52.09, 55.95]	49.48 [47.57, 51.38]	25.13 [22.95, 27.31]
Sex of respondent			
Male	45.16 [42.58, 47.73]	39.20 [36.69, 41.72]	14.17 [11.54, 16.79]
Female	61.15 [58.83, 63.47]	57.74 [55.41, 60.07]	31.64 [28.87, 34.41]
Age (years)			
< 25	42.13 [37.44, 46.81]	49.89 [45.17, 54.61]	18.42 [12.93, 23.92]
25–29	47.26 [42.71, 51.81]	46.41 [41.81, 51.02]	21.87 [16.33, 27.42]
30–39	54.52 [51.14, 57.89]	49.73 [46.43, 53.04]	26.12 [22.18, 30.06]
40–49	58.59 [54.74, 62.44]	48.05 [44.17, 51.94]	26.11 [22.75, 30.47]
≥50	59.18 [55.82, 62.53]	51.55 [48.15, 54.95]	27.17 [23.35, 31.00]
Marital Status			
Never Married	42.77 [39.67, 45.86]	44.59 [41.43, 47.74]	21.49 [17.63, 25.35]
Currently Married/Cohabiting	59.16 [56.64, 61.68]	50.99 [48.50, 53.48]	25.39 [22.62, 28.17]
Previously Married	57.98 [53.46, 62.50]	55.35 [50.79, 59.91]	28.92 [23.47, 34.37]
Educational level			
None	58.26 [54.12, 62.41]	49.91 [45.68, 54.15]	26.57 [21.72, 31.42]
Primary	65.52 [61.10, 69.93]	62.50 [57.90, 67.10]	37.83 [32.27, 43.39]

	Awareness of CHPS/Outreach points n = 3543	Intention to access and use services provided by CHPS. n = 3543	Ever received or utilized healthcare services provided by CHOs at the CHPS compound or outreach points. n = 1914
		67.10]	
JHS/JSS	55.00 [51.58, 58.42]	53.33 [49.98, 56.69]	24.43 [20.57, 28.30]
SSS/SHS	47.15 [44.07, 50.24]	45.02 [41.94, 48.10]	21.13 [17.50, 24.76]
Tertiary	51.11 [46.00, 56.21]	38.08 [33.02, 43.15]	16.83 [11.67, 21.99]
Employment Status			
Unemployed	44.02 [40.91, 47.13]	44.75 [41.62, 47.88]	24.69 [20.77, 28.61]
Employed	58.50 [56.31, 60.68]	51.59 [49.41, 53.78]	25.28 [22.80, 27.76]
Religion			
Christian	49.97 [47.40, 52.55]	50.07 [47.50, 52.65]	29.19 [26.06, 32.32]
Muslim	59.44 [56.53, 62.35]	49.38 [46.54, 52.23]	20.46 [17.50, 23.41]
Other	55.26 [44.11, 66.42]	35.52 [25.05, 46.00]	26.19 [12.78, 39.60]
Valid NHIS card			
No	54.40 [51.66, 57.15]	48.20 [45.46, 50.94]	22.54 [19.40, 25.68]
Yes	53.77 [51.33, 56.20]	50.33 [47.90, 52.76]	26.88 [24.08, 29.68]
Location of households			
Nonslum	41.81 [37.75, 45.88]	34.76 [30.88, 38.64]	14.16 [10.08, 18.23]
Slum	57.55 [55.40, 59.70]	53.73 [51.59, 55.87]	27.43 [24.98, 29.89]
Household Size			
< 5	47.73 [45.28, 50.19]	47.27 [44.79, 49.74]	20.45 [17.70, 23.20]

	Awareness of CHPS/Outreach points n = 3543	Intention to access and use services provided by CHPS. n = 3543	Ever received or utilized healthcare services provided by CHOs at the CHPS compound or outreach points. n = 1914
5–7	60.45 [56.74, 64.17]	51.08 [47.44, 54.72]	20.86 [17.02, 24.69]
8+	70.47 [65.85, 75.10]	56.47 [51.56, 61.37]	47.40 [41.33, 53.47]
Household wealth			
Poor	49.13 [46.02, 52.24]	51.93 [48.82, 55.04]	23.54 [19.89, 27.18]
Middle	54.77 [50.32, 59.24]	38.85 [34.49, 43.20]	6.64 [3.97, 9.33]
Rich	60.56 [57.50, 63.62]	52.01 [49.00, 55.01]	35.50 [31.78, 39.22]
Community			
Ashaiman (Intervention)	41.30 [37.38, 45.22]	48.16 [44.44, 51.88]	28.19 [22.93, 33.45]
Madina (Intervention)	55.07 [51.04, 59.10]	46.43 [42.59, 50.27]	25.31 [20.87, 29.76]
Mamobi (Control)	58.15 [54.56, 61.74]	47.46 [43.70, 51.21]	23.93 [19.88, 27.98]
Nima (Control)	60.16 [56.45, 63.86]	55.80 [52.02, 59.59]	24.30 [20.36, 28.25]

n/a: not applicable, CHO: Community Health Officer, CHPS: Community-based Health Planning and Services, NHIS: National Health Insurance Scheme. Note: Prevalence levels are presented as percentages and were computed from model predictions (using GLMs with negative binomial distributions and log links), with estimates for subgroups of each characteristic computed from separate models, each containing only an independent variable for the relevant characteristic.

Factors associated with the utilization of healthcare services provided by CHOs at the CHPS compound outreach points

The following factors were associated with the utilization of healthcare services provided by the CHPS within poor urban settings: sex, household wealth, and household size (Table 3). The results from the difference in prevalence estimates showed that the utilization of healthcare services provided by CHOs increased by 17.5 percentage points (pp) [95% CI:14.01, 20.94; $p < .001$] among females compared to males and 12.0 pp [95% CI: 6.72, 17.21; $p < .001$] among the rich compared to the poor. The utilization of

healthcare services increased by 13.3 pp [95% CI: 8.53, 18.02; $p < .001$] among people living in slum areas compared to those living in non-slum areas.

Table 3
Factors associated with the use of health services provided by CHOs at the CHPS compound/outreach points.

Ever received health services provided by CHOs at the CHPS compound/outreach points		
	Prevalence Ratio [95% CI]	Prevalence Difference [95% CI]
Sex of respondent		
Male	ref	ref
Female	2.23 [1.85, 2.70] ***	17.47[14.01, 20.94]***
Age of respondent		
< 25	ref	ref
25–29	1.19 [0.80, 1.76]	3.45 [-4.36, 11.27]
30–39	1.42 [1.02, 1.98] *	7.70 [0.97, 14.43]*
40–49	1.42 [1.01, 1.98] *	7.69 [0.81, 14.56]*
>=50	1.48 [1.07, 2.04] *	8.76 [2.21, 15.30]*
Marital Status		
Never Married	1	
Currently Married/Cohabiting	1.18 [0.96, 1.45]	3.91 [-0.73, 8.55]
Previously Married	1.35 [1.04, 1.73] *	7.43 [0.93, 13.94]*
Educational level		
None	ref	ref
Primary	1.42 [1.13, 1.79] **	11.26 [4.07, 18.45]**
JHS/JSS	0.92 [0.73, 1.16]	-2.14 [-8.20, 3.93]
SSS/SHS	0.80 [0.62, 1.02]	-5.44 [-11.34, 0.51]
Tertiary	0.63 [0.45, 0.90] *	-9.74 [-16.64, -2.84]*
Employment Status		
Unemployed	ref	ref
Employed	1.02 [0.86, 1.23]	0.59 [-3.87, 5.05]
Religion		
Christian	ref	ref

Ever received health services provided by CHOs at the CHPS compound/outreach points		
	Prevalence Ratio [95% CI]	Prevalence Difference [95% CI]
Sex of respondent		
Muslim	0.70 [0.59, 0.84] ***	-8.73 [-13.01, -4.45]***
Other	0.90 [0.53, 1.51]	-3.00 [-16.68, 10.68]
Valid NHIS card		
No	ref	ref
Yes	1.19 [1.01, 1.41] *	4.34 [0.30, 8.39]*
Location of households		
Nonslum	ref	ref
Slum	1.94 [1.43, 2.62] ***	13.28 [8.53, 18.02]***
Household Size		
< 5	ref	ref
5–7	1.02 [0.81, 1.28]	0.41 [-4.33, 5.15]
8+	2.32 [1.92, 2.79] ***	26.95 [20.28, 33.62]***
Household wealth		
Poor	ref	ref
Middle	0.28 [0.18, 0.43] ***	-16.89 [-21.41, -12.37]
Rich	1.51 [1.25, 1.82] ***	11.96 [6.72, 17.21]***

CHO: Community Health Officer, CHPS: Community-based Health Planning and Services, NHIS: National Health Insurance Scheme, P value notation: *p value < 0.05; **p < 0.01; ***p < 0.001, CI: confidence interval, Ref: reference category. Note: Prevalence levels are presented as percentages and were computed from model predictions (using GLMs with negative binomial distributions and log links), with estimates for subgroups of each characteristic computed from separate models, each containing only an independent variable for the relevant characteristic. Prevalence differences are presented as percentage point differences based on the same set of models and computed from model predictions. All confidence intervals were based on the delta method using cluster robust standard errors.

Assessing inequality in the utilization of healthcare services provided by the CHPS in urban settings

The concentration index (CI) of 0.129 ($p = 0.026$, Table 4) confirms that the utilization of healthcare services provided by the CHPS is significantly more concentrated among the rich or better-off sample households identified by a greater position in the wealth index distribution compared to the poor households. Our results showed a significant difference in the utilization of healthcare services provided by the CHPS among wealthy households compared to poor households in both the slum and non-slum households. The point estimate of the concentration index demonstrated that slum households are more likely to benefit from healthcare services provided by the CHPS than non-slum households (CI = 0.159 for slum households versus -0.003 for non-slum households, F test statistic = 8.182, $p = 0.004$). A significant concentration of utilization of healthcare services provided by the CHPS was found among larger households (8 or more inhabitants) compared to smaller households ($F = 15.081$, $p < 0.001$). Similar observations were found among the different levels of education, as the utilization of healthcare services provided by the CHPS was lower with higher levels of education ($F = 2.474$, $p = 0.043$) (Table 4).

Table 4

Assessing inequality in the utilization of healthcare services provided by the CHPS in urban settings.

Utilization of healthcare services provided by CHOs at the CHPS compound/Outreach points			
	n	Erreygers normalized concentration index (S.E)	Wagstaff (S.E)
Overall	1811	0.129 (0.026)	0.1701(0.034)
Sex of respondent		(F = 0.683, P value = 0.409)	(F = 1.140, P value = 0.286)
Male	677	0.114 (0.030)	0.2392 (0.063)
Female	1134	0.151 (0.032)	0.1720 (0.037)
Age of respondent		(F = 1.637, P value = 0.162)	(F = 1.315, P value = 0.262)
< 25	179	0.050 (0.067)	0.0830 (0.111)
25–29	217	0.091 (0.065)	0.1338 (0.096)
30–39	486	0.072 (0.047)	0.0921 (0.059)
40–49	385	0.193 (0.051)	0.2452 (0.064)
>=50	537	0.171 (0.044)	0.2160 (0.056)
Marital Status		(F = 0.818, P value = 0.441)	(F = 0.522, P value = 0.593)
Never Married	443	0.111 (0.046)	0.1626 (0.067)
Currently Married/Cohabiting	1076	0.117 (0.033)	0.1521 (0.042)
Previously Married	268	0.193 (0.065)	0.2368 (0.080)
Educational level		(F = 2.474, P value = 0.043)	(F = 1.931, P value = 0.103)
None	316	0.202 (0.057)	0.2608 (0.074)
Primary	294	0.187 (0.062)	0.1980 (0.065)
JHS/JSS	494	0.187 (0.046)	0.2487 (0.061)
SSS/SHS	504	0.075 (0.044)	0.1135 (0.066)
Tertiary	195	0.005 (0.056)	0.0088 (0.095)
CHO: Community Health Officer, CHPS: Community-based Health Planning and Services, NHIS: National Health Insurance Scheme, n: number of observations, SE: standard error. Confidence Intervals			

Utilization of healthcare services provided by CHOs at the CHPS compound/Outreach points			
	n	Erreygers normalized concentration index (S.E)	Wagstaff (S.E)
Overall	1811	0.129 (0.026)	0.1701(0.034)
Employment Status		(F = 0.445, P value = 0.505)	(F = 0.349, P value = 0.555)
Unemployed	457	0.1040 (0.047)	0.140 6 (0.063)
Employed	1354	0.1372 (0.029)	0.1793 (0.038)
Religion		(F = 2.054, P value = 0.129)	(F = 0.927, P value = 0.396)
Christian	949	0.167 (0.035)	0.1996 (0.042)
Muslim	824	0.080 (0.036)	0.1219 (0.055)
Other	38	0.067 (0.133)	0.0920 (0.185)
Valid NHIS card		(F = 0.457, P value = 0.499)	(F = 0.107, P value = 0.744)
No	738	0.114 (0.036)	0.1615 (0.052)
Yes	1073	0.143 (0.033)	0.1806 (0.042)
Location of households		(F = 8.182, P value = 0.004)	(F = 7.099, P value = 0.008)
Nonslum	311	-0.003 (0.050)	-0.0058 (0.097)
Slum	1500	0.159 (0.028)	0.1992 (0.035)
Household Size		(F = 15.081, P value < 0.001)	(F = 13.207, P value < 0.001)
< 5	982	-0.060 (0.033)	-0.0915(0.051)
5–7	522	0.147 (0.045)	0.2269 (0.069)
8+	307	0.214 (0.038)	0.2145 (0.038)
CHO: Community Health Officer, CHPS: Community-based Health Planning and Services, NHIS: National Health Insurance Scheme, n: number of observations, SE: standard error. Confidence Intervals			

The multiple bar chart in Fig. 1 shows that the utilization of healthcare services was greater among the rich than the poor relative to the sex of the household head, religion, and education level.

The multiple bar chart in Fig. 2 shows that wealthy households utilized healthcare services more than poor households relative to household size, valid national health insurance cards, type of community,

and household size.

Discussions

In this study, we quantified the level of utilization and compared the level of inequality of healthcare services provided by the CHPS and identified correlates of healthcare service utilization provided by the CHPS in poor urban settings in the Greater Accra Region of Ghana. Although the level of awareness of CHPS/outreach points and the intention to access and use services provided by CHPS CHOs were relatively high, the utilization of healthcare services provided by CHWs at the CHPS compound/outreach points was low. Thus, only a quarter of the people who were aware of the CHPS/Outreach points had actually used their services. This level of utilization is lower than the 65.2% level of utilization reported by Kweku et al. [25], but comparably low utilization of CHPs in urban areas has been previously documented in the medical literature [30]. The level of awareness is low because communities are only likely to hear about the presence of the CHPS during the inauguration of the health facility at the CHPS compound or outreach points but do not fully understand the concept of the urban CHPS zones [31]. Community members who miss out during the inauguration of the CHPS facility and outreach point may not know the core responsibility of CHOs who operate in urban areas and may not be willing to participate in CHO-related activities. Most CHOs have been extensively employed in rural communities to address health inequities, and little attention has been given to understanding the roles of CHOs in urban contexts [32], which could contribute to low awareness and utilization of health services. The low coverage of health services provided by CHOs may also be attributed to inadequate logistics and funding provided to CHOs to enable them to reach out to the larger population, lack of capacity to deliver certain healthcare services within their mandate, neglect by the healthcare system, high attrition rates, inadequate understanding of the CHPS concept and inadequate supervision [33, 34].

Poor urban populations frequently work long hours in unstable employment, which means that they have a high opportunity cost for accessing health services or outreach clinics during the working day.[35] People in urban areas generally prefer to go to a hospital to receive the needed service instead of going to a CHPS zone to be referred to a higher facility [36]. Other challenges faced by CHOs that may hinder the efficient operation of their activities include negative attitudes towards work, poor community engagement, nonavailability of essential medicines, long distances to commute from communities to CHPS compounds and outreach points, and inadequate funding [37].

The primary responsibilities of CHOs include health education, outreach, and direct service provision, but they are not well designed to reach men, youth, or the working class of the population, support community empowerment, or link with social services [32]. CHOs usually target and provide expanded immunization coverage, antenatal, postnatal, breastfeeding, and other maternal and child health services for mothers who live in slum areas and largely ignore other areas of the community, including men in households. CHOs specifically target women living in slum areas with the preconceived perception that those living in slum locations are poor and vulnerable, which could explain why women living in slum locations are major beneficiaries of healthcare services provided by CHOs at the CHPS compound or

outreach points. This finding is consistent with [38]. Compared with males, women generally exhibit good health-seeking behavior; hence, they may be more eager and willing to seek health care from CHOs [39]. Additionally, due to the gendered role of caring for children and elderly people, women tend to have more contact with healthcare providers than males do [40]. In addition, CHPS services include more children and women, even though they are meant to cover other health conditions, including non-communicable diseases (NCDs), that could benefit both men and women. Logistical challenges and inadequate technical expertise may hinder CHOs' ability to provide other health services, including NCDs and related risk factors, especially in urban areas where the risk factors for NCDs are high [41, 42]. The women-friendly services offered by the CHPS, including antenatal care (ANC), child welfare clinics (CWC), postnatal care (PNC), and skilled delivery, cause males to feel left out, and they are unconcerned about the activities of CHPs in their communities. A study by Kushitor et al. revealed that men perceived the CHPS to be a woman's facility since most of its focus is on maternal and childcare services [39]. These challenges could partly explain why the utilization of healthcare services provided by CHOs within the CHPS concept is greater among females than among males and is greater in slum areas than in nonslum areas.

The utilization of healthcare services through the urban CHPS concept is significantly more concentrated among the rich or better-off sample households than among the poor households, highlighting a significant socioeconomic disparity in healthcare access within urban settings. This finding is consistent with a study by Atinga et al. [43] and De Groot et al. [44], who reported that people from higher socioeconomic origins are more likely than people from lower socioeconomic groups to seek healthcare services. The disparity in CHPS use may be related to financial barriers and structural limitations in healthcare access faced by the urban poor. Targeted interventions that lower financial barriers, improve outreach initiatives, and increase the CHPS's ability to reach underserved urban neighborhoods are necessary to address these inequities.

The study also revealed religious differences in healthcare access and utilization, as evidenced by the finding that Muslims use healthcare services less frequently than Christians do, a sharp contrast to the findings of a similar study of the rural CHPS, where a greater percentage of Christian and Muslim respondents received safe-motherhood care than women who reported practicing traditional religion or no religion[45]. There could be a number of reasons for this disparity, such as mistrust in healthcare systems, religious practices, and cultural attitudes. Studies have shown that healthcare utilization discrepancies depending on religious affiliation follow similar trends. For instance, a study conducted in Nigeria by Dyer et al. [46] revealed that Muslims were less likely than Christians to obtain maternity and child healthcare services, with cultural and religious factors being identified as major impediments [46]. To address these gaps, it is necessary to implement culturally sensitive treatments that consider various communities' religious practices and beliefs. Additionally, efforts must be made to strengthen trust among Muslim people and their access to healthcare services.

Due to the rapid population growth in urban areas without a corresponding increase in health infrastructure, ignoring the role of the CHPS in primary health care and using directly higher health

facilities may lead to an uneven strain on the health system [47] and negatively impact Ghana's ability to attain universal health coverage by 2030 [48]. The CHPS program has been found to be effective in reducing under 5 mortality among the poorest and least educated individuals, increasing the use and acceptance of family planning, and reducing fertility [49].

To improve awareness of the urban CHPS, leveraging existing structures such as social, occupational, and religious groups could help people promote their activities. The USAID formative study suggested engaging women's groups and religious organizations as platforms to promote their services [36]. Additionally, continuous education of the community for the purpose of CHPS could help improve its utilization [31]. An increase in awareness could lead to a further increase in the utilization of services as the target population gets to know the range of services offered via the urban CHPS concept [36].

Strengths and limitations

This study used a rigorous analytic cross-sectional design to establish preliminary evidence regarding equity and the current state of healthcare service utilization provided by the CHPS in urban settings. This is a critical requirement for assessing the urban CHPS's performance, monitoring and evaluation and learning, planning, and implementing a well-designed intervention to improve equity and utilization. The findings have significant implications for the planning and developing healthcare service utilization interventions in poor urban communities. Our study, however, has some limitations, including recall and self-reported response biases associated with cross-sectional surveys.

Conclusion

Our study revealed disparities in service utilization between rich and poor people relative to men and women, slum location, education, religion, and household size. The limited use of the CHPS by men due to a perceived focus on maternal and child health has important implications, as the CHPS must be reshaped to address non-communicable diseases. Given that addressing health among the poorest population is a focus of the CHPS, the current inequities in utilization in urban areas need to be addressed. Comprehensive and sociocultural politically sensitive integrated interventions that involve key stakeholder engagement must be implemented to improve the equity, awareness, and utilization of healthcare services provided by the CHPS in poor urban settings.

Abbreviations

CHPS

Community-based Health Planning and Services

CHO

Community Health Officers

GoG

Government of Ghana

Declarations

Ethics approval and consent to participate

The study obtained ethical approval from two institutions (Ghana Health Service and the University of Leeds). Ethical approvals were obtained from the Ghana Health Service Ethics Review Committee (GHS-ERC: 018/08/21) and the University of Leeds Ethical Review Board (MREC 21-021 CHORUS). The study was conducted in accordance with the ethics guidelines of the Declaration of Helsinki. Informed consent was secured from each study participant. The confidentiality of the participants was maintained by not including names or personal identifiers during data collection, analysis, and reporting and respecting the privacy of study participants during interviews. Participants' right to refuse participation, not answer any questions they don't want to, or withdraw participation after enrolling was fully respected.

Consent for publication

Not Applicable

Availability of data and materials

Data will be made available upon reasonable request if all the necessary documentations are duly completed, and the request must be submitted through the Ghana Health Service Ethical Review Committees (ethics.research@ghs.gov.gh)

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

DD, GCA, TE, HE, AN, IA, JN, BE, IAA, and LW conceptualized the study and reviewed the draft manuscript. DD designed the data collection instrument, led the statistical analyses, and wrote the initial draft manuscript. JH and KA reviewed all statistical analyses. BD, KA, SAO, DK, JH, IAA, HE, BE, and GCA were major contributors to the manuscript. All authors read and approved the final manuscript.

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Figures

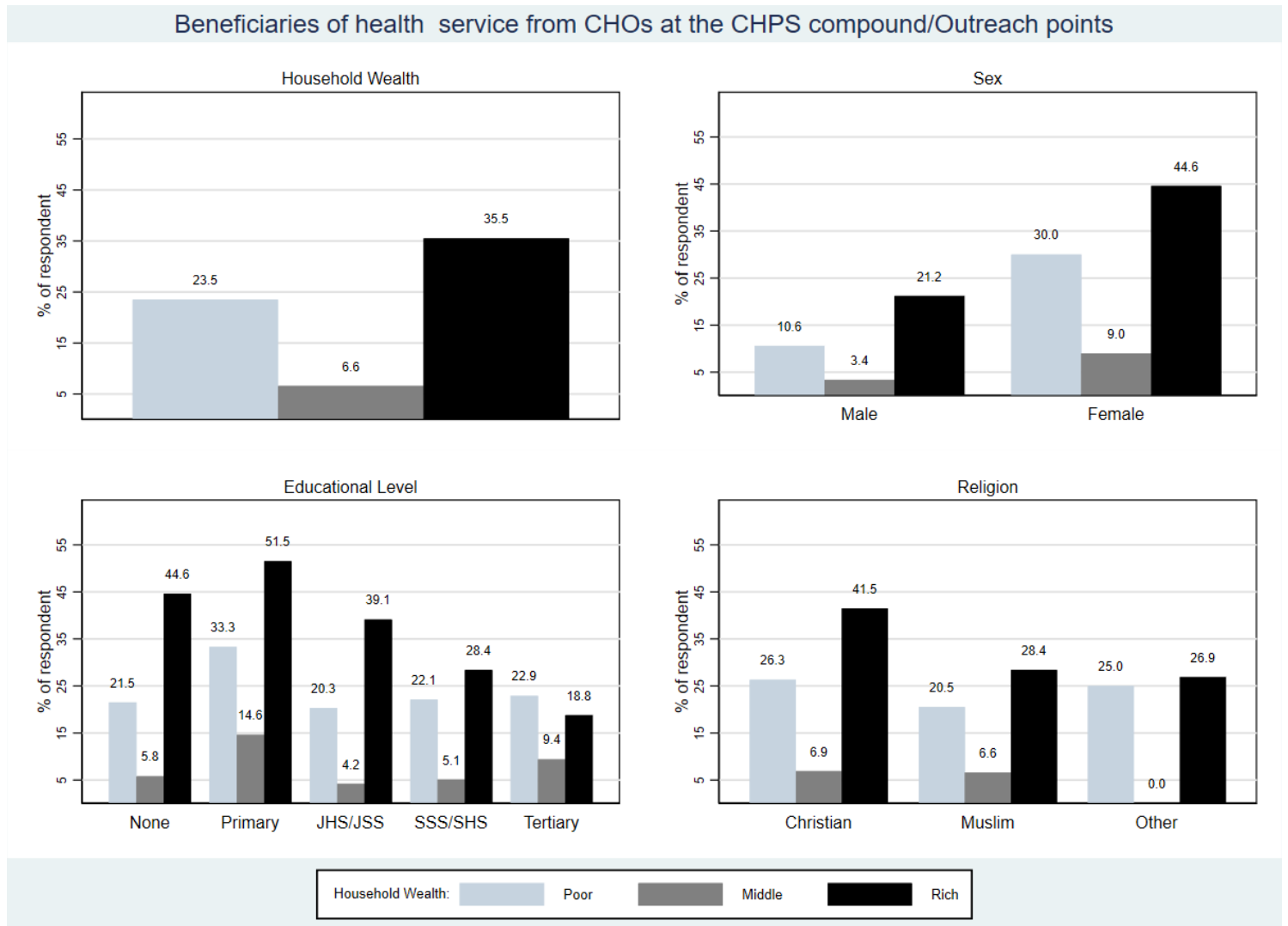


Figure 1

Wealth-related inequality in the utilization of healthcare services relative to the sex of the household head, educational level, and religion

Beneficiaries of health service from CHOs at the CHPS compound/Outreach points

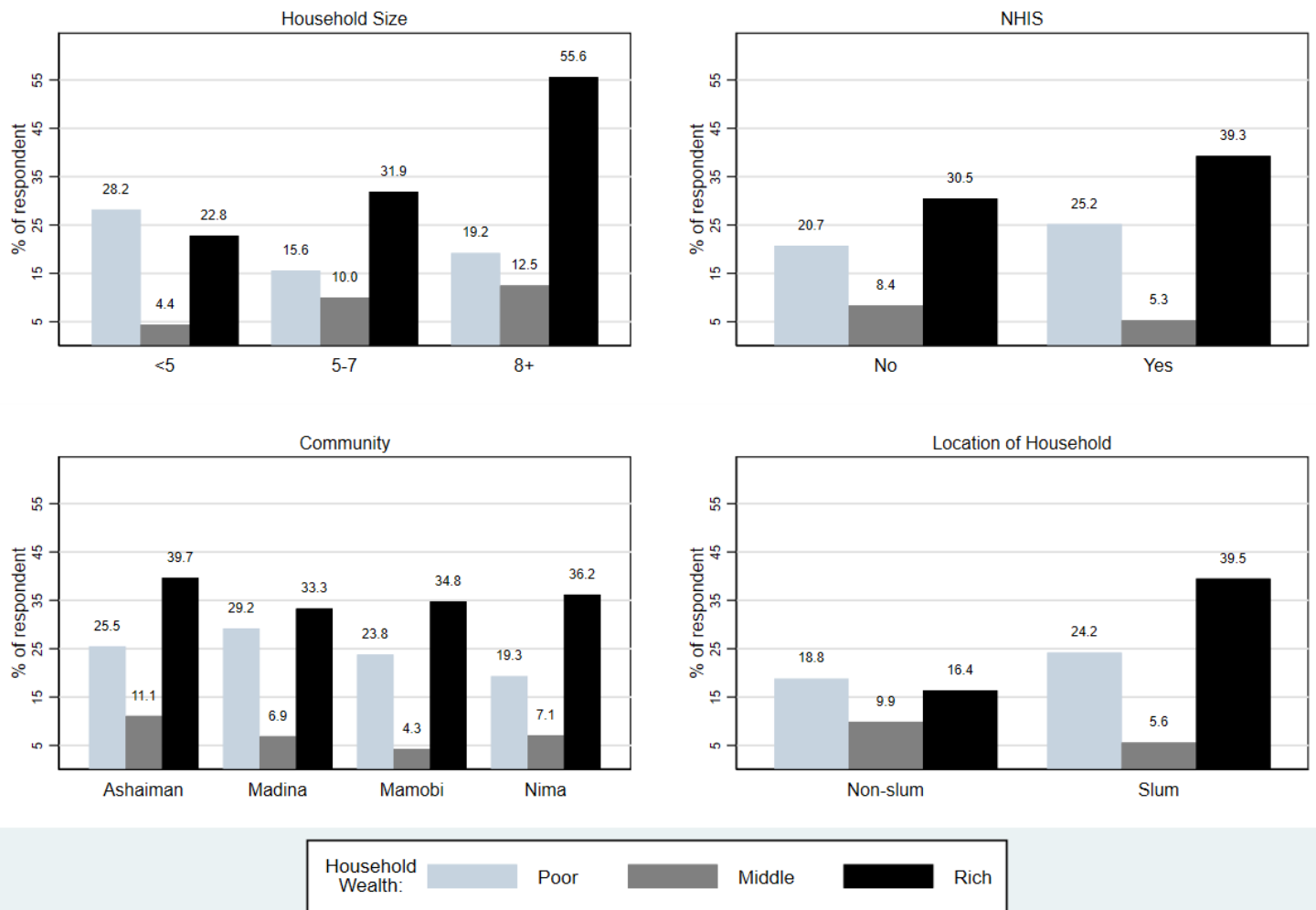


Figure 2

Wealth-related inequality in the utilization of healthcare services relative to the size of the household, NHIS, community, and location of the households