Patterns and predictors of private and public health care utilization in an informal settlement in Nairobi, Kenya: A cross-sectional study

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Abstract

Background

Knowledge of health care utilization is particularly crucial in low-and middle-income countries where inequalities in burden of disease and access to primary health care exist. Inconclusive evidence exists on health-seeking and utilization of health facilities in the informal settlements in Kenya. This study assessed the patterns and predictors of private and public health care utilization in an urban informal settlement in Kenya.

Methods

This cross-sectional study used data from the *Lown scholars* study conducted between June and July 2018. It was nested within the Nairobi Urban Health and Demographic Surveillance System. Households were selected using simple random sampling and data obtained for all household members who reported having sought care for an illness in the 12 months preceding the study. Data were collected on health-seeking behaviour and explanatory variables (predisposing, enabling, and need) using an adaptation of Andersen's conceptual framework. Health care utilization patterns by explanatory variables were described using proportions and multinomial logistic regression used to identify the predictors of private or public health care use.

Results

Three hundred and sixty-four members from 300 households sought care for an illness in the 12 months preceding the study. Almost half (47%) of the respondents sought care from private facilities while about 33% and 20% used public and other facilities, respectively. Health care utilization was influenced by enabling and need factors. Health insurance coverage was associated with private health facility use (aOR 3.06; 95% CI 1.48 − 6.31). Satisfaction with the quality of care was associated with lower use of public facilities (aOR 0.31; CI 0.11 − 0.84) while satisfaction with cost of care was associated with higher use of public facilities (aOR 2.09; CI 1.01 − 4.29). Members who reported an acute infection were more likely to use private facilities (aOR 3.07; 95% CI 1.52 − 6.18).

Conclusions

Health care utilization in the urban informal settlements favours private health facility use. As Kenya commits to achieving universal health coverage, interventions to improve health care access in informal and low-resource settlements should be modelled around enabling and need factors, particularly health care financing and quality of health care provision.

Background

Understanding patterns of health care utilization and knowledge of associated factors is important in improving health service delivery and ensuring equitable access to health services (Jacobs, Bigdeli,

Annear, & Van Damme, 2011). Health care utilization is widely used as an operational proxy for health care access (O'Donnell, 2007). Knowledge of health care utilization is particularly crucial in low-and middle-income countries (LMICs) where inequalities in the burden of disease and access to primary health care exist and may be attributable to the unrealised health gains observed in these settings (O'Donnell, 2007; World Health Organization, 2010). In fact, poor access to- and utilization of health care services are among the key reasons for the high morbidity and mortality rates in these regions (Kruk et al., 2018).

Rapid urbanization in developing countries, especially in sub-Saharan Africa, and the corresponding increase in the urban population has given way to the burgeoning of informal settlements commonly referred to as slums (Phillips, 2014). Slums are associated with conditions that exacerbate poverty and high rates of disease attributable to overcrowding and poor sanitation (Ezeh et al., 2017; Oppong, Mayer, & Oren, 2015; Riley, Ko, Unger, & Reis, 2007). As more evidence becomes available on the burden of disease in informal settlements, it is important to assess the patterns of health care utilization and influencing factors. Universal health coverage in LMICs has largely focused on the public health care sector as it has been argued that public health service provision is the best guarantee for equitable health care access and improved health outcomes for entire populations.

The Kenyan health system is mainly served by three categories of providers: public providers, private not-for-profit organisations – including mission hospitals and faith-based organizations -, and private for-profit organizations (Mugo et al., 2018; Netherlands Enterprise Agency, 2016). Majority of the Kenyan population is served by public health care providers that are mostly operated by the government (Ministry of Health, 2014; Netherlands Enterprise Agency, 2016). However, private facilities are the majority of health service providers in urban informal settlements in Kenya and their population keeps increasing with the growing slum population. The private sector in Kenya operates about 43% of health centres, many of which are found in urban centres. There has been a growing increase in the use of unlicensed providers, drug shops and traditional healers in the slums, potentially delaying opportunities for optimal intervention (Amuyunzu-Nyamongo & Nyamongo, 2006; Robert F Breiman et al., 2011). Kenya's capital, Nairobi has over 200 informal and squatter settlements in which an estimated 60% of the urban population live (African Population and Health Research Center (APHRC), 2014).

Studies in sub-Saharan Africa have assessed factors influencing access to- and utilization of health care especially in rural and low-resourced populations (Adane, Mengistie, Mulat, Kloos, & Medhin, 2017; Ameh, Gómez-Olivé, Kahn, Tollman, & Klipstein-Grobusch, 2014; Awoke et al., 2017; Gyasi, Phillips, & Buor, 2018; Harris et al., 2011; Kiwanuka et al., 2008; Lagarde & Palmer, 2008; Musoke, Boynton, Butler, & Musoke, 2014; O'Donnell, 2007; Oladipo, 2014; Saksena, Xu, Elovainio, & Perrot, 2010; World Health Organization, 2010). In these settings, the main barriers to access of health care are cost of care, proximity to health facilities, perceptions on quality of care and disease status (both perceived and actual). Studies on health care seeking have been conducted in rural (Burton et al., 2011; Ngugi et al., 2017) and urban settings (Taffa, Chepngeno, & Amuyunzu-Nyamongo, 2005; Wairiuko, Cheboi, Ochieng, & Oyore, 2017) in Kenya. Factors found to influence health care seeking in these settings include socio-economic status, severity of

illness, availability and acceptability of health services, quality of health care received and cost of care (Burton et al., 2011; Mukiira & Fotso, 2011; Ngugi et al., 2017; Taffa et al., 2005; Wairiuko et al., 2017). Studies conducted in urban slums have defined health seeking in terms of use or non-use of health facilities without distinction by the type of health facilities (Taffa et al., 2005; Wairiuko et al., 2017). Furthermore, it is not clear how identified factors affect private and public health care utilization in these settings.

Despite there being considerable information on health care access and health care seeking behaviour in Kenya, the available evidence lacks distinction between factors influencing public and private health care utilization in urban informal settings which may impede the implementation of effective interventions and hinder efforts towards the achievement of health equity. This study sought to assess the patterns and predictors of private and public health care utilization in an urban informal settlement in Nairobi, Kenya.

Methods

Aim

The aim of the study was to assess the patterns and predictors of private and public health care utilization in an urban informal settlement in Nairobi, Kenya.

Study design and setting

Data for this study were obtained from the *Lown Scholars* study which aimed to investigate the feasibility of setting up a social health enterprise in the slum setting. This was a cross-sectional study conducted in Viwandani, an informal settlement in Nairobi, Kenya. Viwandani is adjacent to the Nairobi city's industrial area and predominated by migrant young males working in the nearby industries. The *Lown Scholars* study was nested on the Nairobi Urban Health and Demographic Surveillance System (NUHDSS). Since 2003, the African Population and Health Research Center (APHRC) has been running the NUHDSS in two informal settlements (Korogocho and Viwandani). The NUHDSS captures routine information on births, deaths and migration from households twice a year. In 2012, 36,200 people were living in Viwandani (Beguy et al., 2015). The current population is approximately 52,698 people in about 22,739 households.

Study population

The study sample included all household members from selected households who were reported to be ill in the 12 months preceding the study captured by the question: "Has any member of your household been ill in the last 12 months?" Household heads, their spouses or a credible adult (≥18 years old) – herein referred to as the household heads-provided information about household members who were ill, including themselves. Household heads were included in the study if they were adults (≥18 years old) and had resided in Viwandani for at least three months preceding the study.

Sampling of households

Data were obtained from all households sampled in the *Lown scholars* study. The households were selected using simple random sampling from the NUHDSS households sampling frame which includes a listing of all households. The sample size for the original study was calculated using the formula for calculating sample size for cross-sectional studies (Cochran 1977); n= where z, p and are: the standard normal deviation set at 95% confidence level (, the population proportion assumed to be willing to subscribe to the *Lown Scholars* social health enterprise (25%) and the margin error (e=5%) respectively. By using a non-response rate of 4%, the final sample was 300. To select the 300 households, simple random sampling was performed in the NUHDSS database using a random number generator in MS Excel software. The software randomizes the households using the random numbers to create a random list. The first 300 households from the randomized list were selected as the sample for the study. All household members from the 300 households who reported illness in the 12 months preceding the study were included in the study bringing the total to 364 household members.

Conceptual framework

We adapted Andersen's conceptual framework for health care utilization .The framework posits access to- and utilization of health services to be a function of predisposing, enabling and need factors (R. M. Andersen, 1995). Predisposing factors are sociocultural characteristics that exist prior to the onset of illness that predict health care use upon illness (R. Andersen & Newman, 2005). They include demographic characteristics: age, sex, marital status, past illness etc.; social structure such as education, race, occupation, ethnicity and health attitudes and/or beliefs. Enabling factors are logistical conditions that enable one to obtain care including family resources such as income, health insurance coverage and community level factors including availability of health personnel and services (R. Andersen & Newman, 2005). Need factors are the most immediate cause of health service utilization – functional and health problems that generate the need for heath service use (R. Andersen & Newman, 2005). These represent the perceived or evaluated illness of an individual that prompt health service use. Examples include perceived health state and severity of illness.

Data collection

Data were collected electronically on a tablet using an interviewer-administered structured questionnaire. The tool was pre-tested in a similar low-resource community prior to use for this study. The interviews lasted between 30 to 45 minutes. Data were collected between June and July 2018.

Measurements

Outcome variable

Health care use was measured by the type of health facility that household members used in their last illness episode during the 12 months preceding the study. The options were grouped into: (1) public facility (public hospital/health centre) (2) private facility (private hospital/ private health centre or

clinic/NGO mission hospital or health centre) (3) Others (pharmacies/ chemists/ drug shops/traditional healers/herbalists).

Predictor variables

Predisposing factors included in our study included age of household member who was ill, their education level, gender, and marital status of the household head as well as household size. Variables included in the analysis were age, sex, marital status and educational status. We categorized age into five groups (Under five years, 5-17, 18-29, 30-44 and 45 and above); categories of marital status were married, divorced/separated/widowed and never married; and education level was grouped into primary school complete or less, secondary complete and university/college completed.

Enabling factors included possession of health insurance, socioeconomic status, employment status of the household head, accessibility (distance to health facility), satisfaction with health care service delivery and household expenditure on health per household member. Wealth quintiles were computed using NUHDSS data on household utilities (source of drinking water, type of toilet facility, cooking fuel used and lighting type at night), household characteristics (materials used to construct floor, wall and roof of dwelling) and household possessions (ownership of household items) for the households included in the study. Principal component analysis (PCA) was used to first generate a wealth index from the household variables which was later grouped into quintiles. The lowest wealth quintile (Q1) represents the poorest and the highest quintile (Q5) the richest household; employment status included employed, casual worker, trader and unemployed; satisfaction with health care services measured whether respondents were satisfied with waiting time, friendliness and respect of the provider, privacy of consultation and treatment received, quality of advice and information, procedure of treatment, cost of health services, and quality of services received at the primary care facility they visited for routine care. The variables were coded as 1-not satisfied at all, 2-slightly satisfied, 3-moderately satisfied, 4-very satisfied, 5-extremely satisfied; which was further recoded into two groups 1-satisfied (moderately satisfied, very satisfied, extremely satisfied) and 0-not satisfied (slightly satisfied, not satisfied at all).

We included both perceived and evaluated (physical) health status as need factors in the analysis. Perceived general health status of household members by the household head was measured in three categories: very good, moderate and not good, while evaluated health status included the medical condition that the ill household member sought care for. We categorized the health states into six broad categories including: acute infections (malaria, gastrointestinal conditions, typhoid, and respiratory tract infections), mild infections and others which included illnesses that were in low frequency in the sample ; chronic infections (tuberculosis, HIV/STIs), chronic non-communicable diseases (NCDs) (diabetes, hypertension and chronic kidney disease), injuries or trauma and other uncommon conditions (hormonal conditions, autism, meningitis, eye and ear complications, skin conditions and dental conditions).

The adapted framework is shown in figure 1.

Data analysis

Descriptive tables showing counts and proportions of predictor variables including age, wealth quintile, health insurance status, education status of household head, employment status of household head, satisfaction with health services and health condition prompting health care utilization are presented by health care utilization source (public, private and other facilities). Chi-square test of proportions was conducted to assess the associations between explanatory variables and the outcome.

Multinomial logistic regression was applied to identify factors associated with private or public health care use using 'other facilities' (pharmacies/ chemists/ drug shops/traditional healers/herbalists) as the reference group. Bivariate analysis was conducted for predisposing, enabling and need factors to identify variables independently associated with health service use. Only variables with $p<0.2$ were considered for inclusion in the multivariate model. We built the multivariable model in a stepwise manner first including predisposing factors (model 1), then enabling factors (model 2) and finally need factors (model 3) – all variables of which were found to be significant in the bivariate model. The multinomial model was adjusted for clustering at household level considering data was collected from all individuals who reported being ill and seeking care for the illness in each household. The generalised Hosmer-Lemeshow goodness-of-fit test was used to assess the goodness-of-fit of the adjusted model. Crude and adjusted odds ratios (aOR) and 95% confidence intervals were reported for each determinant. Variables were considered significant predictors at $p<0.05$.

Results

The distribution of study participants by their patterns of health care utilization is presented in table 1. Demographic characteristics are also captured in this table.

Demographic characteristics of study sample

In total, 364 individuals from the 300 households sought health care for an illness in the 12 months preceding the study. There were more females (60%) and approximately two thirds (61%) of the households had at least three members. The average age of household members was 22 years inter-quartile range (IQR 6-35) and more than half were from households where the household head was married. Approximately 21% of household heads were employed and 53% had at least secondary education. Household heads who had completed tertiary education accounted for only 7% of the sample.

Distribution of study sample by patterns of health care utilization

Almost half (47%) of the respondents sought care from private facilities while about 33% and 20% utilized public and other facilities respectively. Overall, about 46% of the household members were covered by a health insurance scheme. A higher proportion of household members covered by health insurance used private facilities (58%) as compared to public (29%) and other facilities (14%). While more members from the richest households (63%) sought care from private facilities than those from poorest households (34%), public health facilities were used by a higher proportion of members from poorest households (44%) than the richest households (20%). About half of the household members sought care

for acute infectious disease conditions, 27% for mild infections and 20% for other diseases. Private facilities were used by about half (55%) of the household members who fell ill with acute infections. while for public facilities, they accounted for 30%. For household members who fell ill with mild conditions, 39% sought care from private facilities while about a third sought care from public and other facilities respectively.

Predictors of health care utilization

Table 2 shows results from the unadjusted and adjusted multinomial logistic regression model of factors affecting the utilization of health care facilities. Enabling and need factors were significant predictors of public and private health care utilization. None of the predisposing factors were significant. With regards to enabling factors, household members who had health insurance coverage had higher odds of using private health facilities as opposed to other facilities in Viwandani (OR 3.06; 95% CI 1.48 − 6.31). Respondents who were satisfied with the quality of care in their primary health care facility had 69% lower odds of using public health care facilities as compared to other facilities (OR 0.31; CI 0.11 − 0.84) while those that were satisfied with the cost of care had twice the odds of using public facilities (OR 2.09; CI 1.01 − 4.29). As for need factors, respondents who reported having had an acute infection in the 12 months preceding the study had thrice the odds of using private (OR 3.07; 95% CI 1.52 − 6.18) facilities as compared to other facilities in Viwandani.

Discussion

This study sought to investigate patterns and predictors of private and public health care utilization in the context of an urban informal settlement in Kenya. Our findings indicate higher use of private facilities than public facilities in the study area which supports current evidence of increased private health care facility use in informal settlements in Kenya (Mukiira & Fotso, 2011) . This has been caused in part by the rapid growth of urban informal settlements in Kenya accompanied by a paralleled mushrooming of private health facilities in these settings (Bazant, Koenig, Fotso, & Mills, 2009; Owino, 2015). . Contrary to our findings, the latest national household health expenditure and utilization survey (KHHEUS) indicated higher outpatient use of public health care facilities (44%) than private facilities (29%) (Ministry of Health, 2014). The fact that public health care utilization in slums −supported by our study findings- are the opposite of the national picture are concerning since the government's commitment towards universal health coverage (UHC) targets are focused on the public health sector. Studies have recommended the regulation of private health facilities in urban slum settlements, and promotion of public-private partnerships to improve quality health care access in these settings (Fotso, Mukiira 2011).

Empirical literature from LMICs supports our findings that health insurance cover is a strong predictor of private health care utilization (Chuma & Okungu, 2011; Gyasi et al., 2018; Saksena et al., 2010; World Health Organization, 2010). Cost of health care is a significant barrier to access of health services in LMICs where payment for health care is mainly out-of-pocket (OOP) (Lagarde & Palmer, 2008; O'Donnell, 2007; Rutebemberwa, Pariyo, Peterson, Tomson, & Kallander, 2009; Saksena et al., 2010). As a result,

health care use is on the basis of wealth instead of need depriving those of lower economic status access to health services, leading to high morbidity and mortality from preventable diseases (Bonfrer, van de Poel, Grimm, & Van Doorslaer, 2013; Tey & Lai, 2013). Cost of care remains a paramount issue in accessing health care in Kenya especially in low resource settings and is a major contributor to health care inequity. (Chuma & Okungu, 2011; Turin, 2010; Umeh, 2018). Kenya's commitment towards universal health coverage aims at cushioning citizens against OOP expenditure on health which pushes approximately one million Kenyans into poverty each year. Strategies employed to reduce out of pocket costs include the abolishment of user fees in public health care facilities in 2013 and scale-up of National Health insurance Fund (NHIF) coverage (World Bank Group, 2014). However, majority of residents in informal settlements use private facilities which are in majority and therefore warrant for directed policy interventions to mitigate catastrophic expenditure. Private-public partnerships and the promotion of social or community health enterprises are recommended as prospective interventions to promote and balance access and utilization of private and public health care in informal settlements (Bakibinga et al., 2014; Marek, O'Farrell, Yamamoto, & Zable, 2005).

Patient satisfaction is an important indicator for measuring quality of health care and has been widely used to measure health system performance in high and low income settings (Awoke et al., 2017; Masango Makgobela, Ndimande, Ogunbanjo, Bongongo, & Nyalunga, 2018; Valentine, Bonsel, & Murray, 2007). As an enabling factor, satisfaction with quality of care in the respondents' primary health care facility was associated with lower utilization of public health care which could point towards dissatisfaction with the quality of public health care among study respondents. This finding is confirmed by a study conducted in public facilities in Kenyan slums which found that there was higher dissatisfaction with services provided due to lack of drugs, long waiting times and bad attitudes from the staff (Wambua et al., 2015). Satisfaction with cost of care at the facility was also associated with higher use of public facilities. Evidence from LMICs has found user fees to be a barrier to health care utilization (Lagarde & Palmer, 2008). In the Kenyan context, reduction of user fees at public facilities revealed increased health care utilization which in turn put pressure on the public health care system (Okech & Lelegwe, 2016).

Urban informal settlements in Kenya are characterized by overcrowding, poor sanitation and hygiene, and limited access to clean water which makes the population vulnerable to infectious and vector-borne diseases (Beguy et al., 2015; Gulis, Mulumba, Juma, & Kakosova, 2004). Our findings that majority of the study sample in Viwandani fell ill with acute and mild infectious diseases including gastrointestinal, typhoid, malaria and respiratory diseases (including pneumonia and respiratory tract diseases) support available evidence. Our findings of higher use of private facilities for acute infectious conditions are similar to findings from studies conducted in similar settings (Robert F. Breiman et al., 2011; Mohamed et al., 2014). Non-licensed and licensed private providers have been reported to be the major source of care for common infectious disease-related illnesses in informal settlements (Robert F. Breiman et al., 2011). Population-based surveillance in Kenya also confirms infectious and respiratory illnesses as a major cause of morbidity and mortality in both children and adults, with many deaths occurring at home (Breiman et al., 2015; Feikin et al., 2011).

Limitations

The inclusion of only one informal settlement as the setting in this study may limit its generalizability to country-wide informal settlements. However the findings may inform interventions in similar urban informal settlements which may be instrumental in informing intervention to improve access to- and utilization of public and private health care in those settings. Recall bias may be a limitation in this study as the study relied on self-reported health care utilization of household members. To minimize this, we obtained data on health care utilization for the latest illness episode during the 12 months preceding the study.

Conclusions

Based on the study findings, we conclude that health care utilization in the urban informal settlements is disproportionate and favours private health facility use. Private and public health care utilization is influenced by enabling (health insurance status and satisfaction with health care) and need factors (physical health state). Interventions to improve public and private health care utilization in informal settlements should address enabling and need factors.

Information from this study is helpful to policy makers in guiding interventions that promote equitable access to health services in urban informal settlements in Kenya where multiple health inequalities exist. This is especially important and timely as universal health coverage is a top agenda of the national government of Kenya.

Abbreviations

NUHDSS: Nairobi Urban Health and Demographic Surveillance System

LMICs: Low- and middle-income countries

APHRC: African Population and Health Research Center

PCA: Principal component analysis

HIV/STIs: Human immunodeficiency virus/ sexually transmitted infections

NCDs: Non-communicable diseases

OR: Odds ratio

aOR: Adjusted odds ratio

CI: Confidence interval

Declarations

Ethics approval and consent to participate

The study was approved by Amref Ethics and Scientific Review Committee (ESRC). All household heads (respondents) were briefed about the study and their rights and provided written informed consent prior to participation in the interviews, which included consent to provide information about other household members. Since minors were not surveyed, parental consent was not required. The household heads simply provided information on health care utilization of household members after providing written informed consent.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to grant agreements on data use but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

EW conceptualized the study, reviewed literature, contributed to data analysis and prepared the initial draft of the manuscript. EW, PO, SM, HD, and MM made substantive contributions to the conceptualization of the study, development and review of the manuscript. MM supported data analysis for the study. All authors read and approved the final manuscript.

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Tables

Table 1 Distribution of study participants by patterns of health care utilization

	Public facility n (%)	Private facility n (%)	Other facilities n (%)	Total n (%)
Predisposing factors				
Age				
Under 5 years	23 (30.7)	37 (49.3)	15 (20.0)	75 (20.6)
5-17	26 (32.5)	40 (50.0)	14 (17.5)	80 (22.0)
18-29	24 (28.2)	46 (54.1)	15 (17.7)	85 (23.4)
30-44	33 (38.4)	35 (40.7)	18 (20.9)	86 (23.6)
45+	13 (34.2)	13 (34.2)	12 (31.6)	38 (10.4)
Sex				
Female	76 (34.7)	104 (47.5)	39 (17.8)	219 (60.2)
Male	43 (29.7)	67 (46.2)	35 (24.1)	145 (39.8)
Marital status**				
Married	63 (26.7)	124 (52.5)	49 (20.8)	236 (64.8)
Divorced/separated/widowed	20 (39.2)	21 (41.2)	10 (19.6)	51 (14.0)
Never married	36 (46.8)	26 (33.8)	15 (19.5)	77 (21.2)
Enabling factors				
Wealth quintile**				
Q1 (poorest)	27 (44.3)	21 (34.4)	13 (21.3)	61 (16.8)
Q2	23 (37.1)	21 (33.9)	18 (29.0)	62 (17.0)
Q3	23 (28.4)	41 (50.6)	17 (30.0)	81 (22.3)
Q4	31 (36.5)	41 (48.2)	13 (15.3)	85 (23.4)
Q5 (richest)	15 (20.0)	47 (62.7)	13 (17.3)	75 (20.6)
Health insurance status**				
Covered by insurance	48 (28.6)	97 (57.7)	23 (13.7)	168 (46.2)
Not covered by insurance	71 (36.2)	74 (37.8)	51 (26.0)	196 (53.9)
Education status of household head				
Primary complete or less	48 (32.9)	66 (45.2)	32 (21.9)	146 (40.1)
Secondary complete	67 (34.7)	87 (45.1)	39 (20.2)	193 (53.0)
College/University complete	4 (16.0)	18 (72.0)	3 (12.0)	25 (6.9)
Employment status of household head				
Employed	14 (18.4)	49 (64.5)	13 (17.1)	76 (20.9)
Casual worker	43 (38.4)	44 (39.3)	25 (22.3)	112 (30.8)

Trader	40 (36.0)	49 (44.1)	22 (19.8)	111 (30.5)
Unemployed	22 (33.9)	29 (44.6)	14 (21.5)	65 (17.9)
Need factors				
Physical health state				
Acute infections**	58 (30.2)	106 (55.2)	28 (14.6)	192 (52.7)
Mild infections	30 (30.0)	39 (39.0)	31 (31.0)	100 (27.5)
Chronic infections**	5 (83.3)	1 (16.7)	0	6 (1.6)
Chronic NCDs	6 (42.9)	7 (50.0)	1 (7.1)	14 (3.8)
Other diseases	20 (38.5)	18 (34.6)	14 (26.9)	52 (14.3)
Total	**119 (32.7)**	**171 (47.0)**	**74 (20.3)**	**364 (100.0)**

Notes: Other facilities include pharmacies/ drug shops and traditional healers, ** χ^2 p-value <0.05, *** χ^2 p-value <0.01

Table 2 Predictors of health care utilization

	Unadjusted				Adjusted			
	Public		Private		Public		Private	
	OR [CI]	P value	OR [CI]	P value	aOR [CI]	P value	aOR [CI]	P value
Sex								
Female (Ref)	1.00		1.00		1.00		1.00	
Male	0.63 [0.33 ; 1.21]	0.168	0.72 [0.38 ; 1.36]	0.309	0.76 [0.35 ; 1.64]	0.490	0.64 [0.29 ; 1.37]	0.248
Age (years)								
Less than 5 years (Ref)	1.00		1.00		1.00		1.00	
5;17	1.21 [0.48 ; 3.04]	0.847	1.16 [0.49 ; 2.72]	0.210	0.97 [0.35 ; 2.69]	0.632	1.27 [0.52 ; 3.13]	0.193
18;29	1.04 [0.42 ; 2.61]		1.24 [0.54 ; 2.87]		1.02 [0.36 ; 2.88]		1.62 [0.60 ; 4.38]	
30;44	1.20 [0.50 ; 2.85]		0.79 [0.34 ; 1.80]		1.31 [0.52 ; 3.31]		0.85 [0.35 ; 2.05]	
45+	0.71 [0.25 ; 1.96]		0.44 [0.16 ; 1.18]		0.57 [0.17 ; 1.84]		0.42 [0.12 ; 1.45]	
Marital status								
Married (Ref)	1.00		1.00		1.00		1.00	
Divorced/separated	1.56 [0.62 ; 3.92]	0.205	0.83 [0.33 ; 2.07]	0.635	1.27 [0.42 ; 3.88]	0.333	0.74 [0.27 ; 2.00]	0.497
Never married	1.87 [0.87 ; 3.98]		0.68 [0.31 ; 1.52]		1.88 [0.81 ; 4.37]		0.59 [0.24 ; 1.47]	
Insurance cover								
No (Ref)	1.00		1.00		1.00		1.00	
Yes	1.50 [0.77 ; 2.90]	0.230	2.91 [1.53 ; 5.53]	0.001	1.73 [0.82 ; 3.67]	0.152	3.06 [1.48 ; 6.31]	0.003
Employment status								
Employed (Ref)	1.00		1.00		1.00		1.00	
Casual worker	1.60 [0.56	0.802	0.47	0211	1.75	0.816	0.73	0.797

	; 4.55]		[0.19 ; 1.17]		[0.55 ; 5.55]		[0.26 ; 2.04]	
Trader	1.69 [0.58 ; 4.88]		0.59 [0.23 ; 1.55]		1.55 [0.49 ; 4.97]		0.70 [0.25 ; 1.97]	
Unemployed	1.46 [0.43 ; 4.95]		0.55 [0.18 ; 1.64]		1.47 [0.34 ; 6.29]		0.50 [0.13 ; 1.93]	
Satisfaction with health care								
Cost of service								
No (Ref)	1.00		1.00		1.00		1.00	
Yes	2.31 [1.12 ; 4.74]	0.023	0.93 [0.48 ; 1.80]	0.829	2.09 [1.01 ; 4.29]	0.045	0.77 [0.40 ; 1.32]	0.460
Quality of health care								
No (Ref)	1.00		1.00		1.00		1.00	
Yes	0.30 [0.12 ; 0.74]	0.009	0.65 [0.25 ; 1.66]	0.366	0.31 [0.11 ; 0.84]	0.023	0.59 [0.19 ; 1.85]	0.364
Physical health state								
Acute infectious								
No (Ref)	1.00		1.00		1.00		1.00	
Yes	1.66 [0.89 ; 3.09]	0.114	2.84 [1.53 ; 5.26]	0.001	2.46 [1.14 ; 5.34]	0.063	3.07 [1.52 ; 6.18]	0.002
Other diseases								
No (Ref)	1.00		1.00		1.00		1.00	
Yes	1.39 [0.68 ; 2.83]	0.200	0.71 [0.35 ; 1.44]	0.335	2.52 [0.97 ; 6.57]	0.058	1.61 [0.65 ; 3.99]	0.306

Notes: Goodness-of-fit p-value= 0.424, aOR=adjusted odds ratio, CI=95% confidence interval.
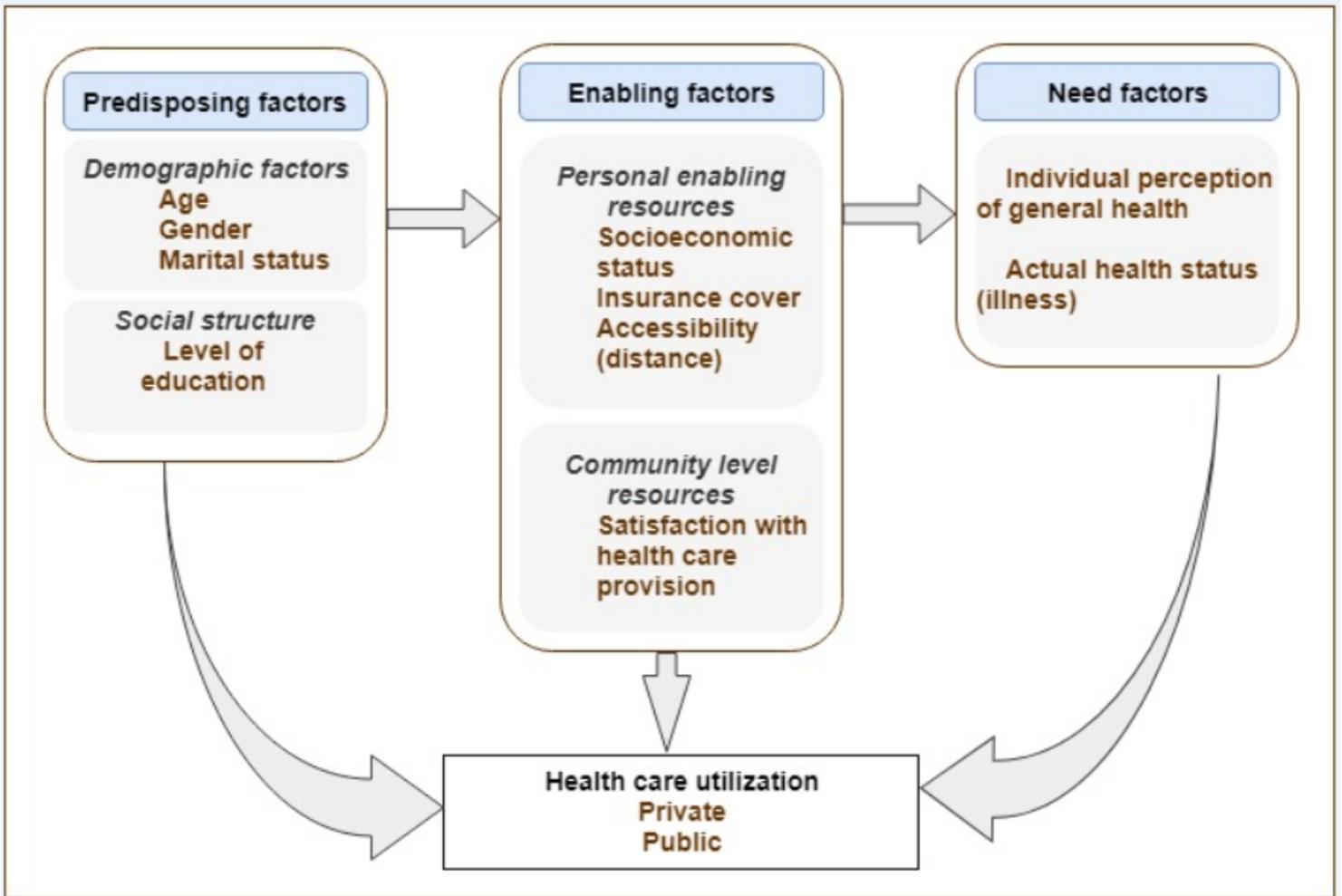Ref=Reference category.

Figures

Figure 1

Adapted conceptual framework of factors affecting health care utilization