Effect of user fees on healthcare accessibility and waiting time in Nigeria

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Abstract

Purpose – This study investigates the effect of user fees on access and waiting time in Nigeria. For access, the effect of user fees on both preventive and curative care; and the effect of user fees on waiting time at public healthcare facilities were examined. User fees are vital for the fiscal sustainability of healthcare provision for most African economies. Its imposition could debar healthcare access by the poor while its removal can reduce quality of care and induce longer waiting time.

Design/methodology/approach – The wave 3 of the Nigerian General Household Survey (2015/16) data was used for users of public health facilities. Access to healthcare was modelled using utilization data in a logistic regression model while waiting time was through the Negative Binomial Regression Model (NBRM).

Findings – The analyses showed significant effects of user fees on access to both preventive and curative care and on time spent waiting to make use of healthcare services. Individuals were able to access healthcare services regardless of amounts paid. Also, there was a non-negative effect of user fee imposition on waiting time.

Practical implications – Nigeria should improve healthcare facilities to address the enormous demand for healthcare services when designing policy for health sector.

Originality/value – This paper shows that even with the imposition of user fees, healthcare facilities could still not cater for the rising healthcare needs of the populace but cautioned that its abolition may not be a preferred option.

Keywords Access, Curative care, Preventive care, User fee

Paper type Research paper

1. Introduction

In most developing economies, the healthcare system requires Out-of-Pocket (OOP) payment at the time of service use (World Health Organization [WHO, 2019]). OOP payment for healthcare in such economies constitutes a larger fraction of total healthcare payments. This is because developing economies are highly informal, limiting revenue mobilization by the government to finance healthcare and other basic infrastructures (World Bank, 2019). OOP payments made by individuals to public healthcare providers at the point of service delivery are often referred to as user charges (Nanda, 2002; Lagarde and Palmer, 2008). Such payments

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can be in the form of registration charges, entrance or consultation fees, drug costs, medical laboratory requirements or charges for any healthcare use whether inpatient or outpatient cares (Lagarde and Palmer, 2008; Ejughemre, 2014). Any prepayment for health services such as insurance contributions and reimbursements to the individual who made the payments are not considered user fees (WHO, 2019). In poor resource settings, where healthcare providers are not adequately paid, user fees constitute a major source of revenue for health workers. They primarily serve as a means of sustaining the provision of health services and improving health system efficiency and service quality. However, there are concerns that user fees in developing economies are associated with catastrophic and impoverishing health expenditures, and hence reduce healthcare system performance (WHO, 2019).

For most developing economies, user fees were introduced in the 1980s and 1990s in response to the World Bank structural adjustment package (Lagarde and Palmer, 2008; Njagi *et al.*, 2018). The World Bank envisioned user fees as an important source of revenue generation that would create financial sustainability in healthcare systems of developing countries. This is mainly to reduce financial strain on the government because such countries do not have sufficient financial resources to fund their healthcare system. In line with this position, the imposition of user fees was expected to improve healthcare access by increasing the number and functioning of health facilities, especially when fiscal sustainability is difficult. The reinvestment of revenue from user fees could also allow provision of a broad range of health services and hence improve the quality of care by reducing waiting time, and increasing health infrastructure and outcomes (Aburayya *et al.*, 2020). It was also seen as a means to curb demand-side moral hazards, curtail the abuse of healthcare services and also increase the efficiency of healthcare delivery (Burger and Christian, 2020).

Literature evidence suggests that revenue generated from user fees can be very low and insignificant to allow improvement in healthcare provision or reduce healthcare burden on the government (Dowhaniuk, 2021; Manthalu *et al.*, 2016 and Timyan *et al.*, 2018). Where this is the case, support for fiscal sustainability of healthcare is not achievable. The viability of user fees in reducing the burden of public healthcare spending for developing economies is also reduced by endemic inefficiencies in the procedure of collecting fees due to management costs and embezzlement. Even though revenue generated from such fees can be too small to have any significant impact on healthcare quality, they may sometimes be too large for poor people. In Nigeria, 62.9% of the population (about 133 million people) are multidimensionally poor in 2022 (NBS, 2022), and this implies that user fees may not meet the required intent of improvement in healthcare access. The incidence of high corruption index in the country could also imply low quality care even with the imposition of user fees (Ensor and Duran-Moreno, 2002; Leone *et al.*, 2016). Despite these possibilities, not many studies have examined the effect of user fees on access and quality of healthcare in Nigeria.

For other African economies, there is a bourgeoning of findings on the effect of user fees on healthcare, particularly concerning access. Findings abound in countries such as South Africa, MAli, Kenya, Tanzania, Ghana, Madagascar and Uganda. Existing studies have, however, shown less attention to user fee impact on the quality of healthcare. The results across countries for the impact of user fees on access to healthcare are uniform, indicating unfavourable effects except for the challenge of financial sustainability of healthcare when fees are abolished (Abel-Smith and Rawal, 1992; Abdelmaged, 2021; Abdu *et al.*, 2004; Amiri *et al.*, 2018; Koch, 2012 and Sengupta *et al.*, 2019). Recent evidence on whether user fees in Nigeria impact the same as in other countries has targeted specific healthcare service (Nyengidiki *et al.*, 2019; Ravit *et al.*, 2018), yet, the nexus between user fees and waiting time is scarce. Hence, this study set out to investigate the impact of user fees on access and waiting time at healthcare facilities in Nigeria. Focus on the effect of user fees on waiting time is key given that literature focuses more on user fees and access. There are possibilities that longer waiting time can be demand-induced such that higher patronage of a healthcare facility with

better infrastructure will raise waiting time due to staff overload and hence service provision may not be of optimum quality.

However, sufficient provision of health facilities with good infrastructure from user fee payments, for example, will inevitably reduce waiting time to access care and hence induce better satisfaction and recovery. We examined the effect of user fees on access to care and waiting time for public health facilities across two main types of care provision: preventive and curative. The rationale behind these objectives stems from two viewpoints. One is that existing studies do not provide ample findings on the effect of user fees on waiting time at healthcare facilities, rather more attention is given to its impact on healthcare access (Koch, 2012; Nyengidiki *et al.*, 2019). Second is that the Nigerian Government subsidize healthcare cost for some preventive care, specifically concerning pregnancy and childbirth in public hospitals. Hence, findings for preventive care would provide recent evidence of the effect of abolition of user charges in Nigeria since such policy is yet to be out-rightly established in the country. This study, therefore, contributes to the existing literature on the user fees effect in three ways. First, it will provide evidence to ascertain if imposition of user fee will boost or impede access to the healthcare services as well as seeing whether it could increase or reduce the waiting time for consumption of healthcare services in Nigeria. This has obvious implication on the health status of the populace. Second, findings are added to the scarce literature on the effect of user fees on waiting time; and third is that the study provides evidence of user fee impact, not only on curative care but also on preventive care, given a dearth of studies of user fee impact on preventive care.

2. Budgetary allocation and healthcare access in Nigeria

Globally, governments strive to provide for the healthcare of its population. In developing nations, however, a major challenge inhibiting access to high-quality healthcare services has been low public healthcare expenditure. Therefore, African countries pledged to commit 15% of government budgetary allocation to health sector in Abuja declaration of 2001. The Nigerian government has not only been consistently defaulting on the Abuja declaration (Shodunke *et al.*, 2022), its level of public healthcare financing is worse than that of her neighbours (Adebisi *et al.*, 2020). A 20-year review of the commitment shows that the budgetary allocation for the health sector to support accessibility increased from N41.2 billion in 2001 to N604.1 billion in 2021 for a population of over 200 million people. Nonetheless, the average allocation by federal government over the period is 5.05% given all the alternative funding (service-wide votes (SWV)), the highest allocation was 6.23% recorded in the year 2012. To further enhance public healthcare funding, the National Health Act mandated that 1% of the federal government's portion of the Consolidated Revenue Fund go to the Basic Health Care Provision Fund (BHCPF) in order to encourage greater national health coverage. This allocation is expected to improve funding of the health sector by more than N60 billion annually. From its commencement in 2018–2021, BHCPF added a total N167.8 billion owing to the refusal of government to keep its end of the bargain on the funds (PASA-DRPC, 2021).

Funding for government-owned hospitals (federal medical centres, federal teaching hospitals, and university teaching hospitals) increased from N156 billion in 2016 to N232 billion in 2018. Despite the allocation's growing trajectory, more than 90% of this money goes toward paying for recurrent expenses. Capital expenditure budgeting is still very little. For instance, in 2015, 2016 and 2017, the capital budgetary allocation was N4.8 billion in 2016. This situation is worse for primary and secondary healthcare services being sponsored by subnational (states) governments which further constrained access to healthcare services. Given the state and federal governments' inadequate budgetary allocations to health sector, individuals and households resorts to user fees payment to meet their healthcare needs. Nonetheless, the widespread poverty in the country implied poor of healthcare public finance in the country, which ultimately hinders the accessibility of quality healthcare services in the nation.

3. Methods

3.1 Model specification and estimation technique

To achieve the objective of this study, empirical analysis follows Burger and Christian (2020) Johnson *et al.* (2012) which model accessibility of healthcare services as a function of household and individual covariates such as hospital distance (HD), Age (AGE) and Aging (AGE^2) captured using the square of Age, Gender (GE), Marital status (MS), Educational attainment (EA), Employment type (EMP), Income (Y) and household size (HHZ). The model is thus stated as:

$$D_{Hi} = D_{Hi}\left(HD_i, P_{hi}, AGE_i, AGE_i^2, GE_i, MS_i, EA_i, EMP_i, Y_i, HHZ_i\right) \tag{1}$$

where D_{Hi} captures access to healthcare for an individual $_i$, and the other variables are as earlier defined. We assume that the demand function follows normal expectations so that

$$\frac{\partial D_{Hi}}{\partial HD_i} < 0, \frac{\partial D_{Hi}}{\partial P_{hi}} < 0, 0 < \frac{\partial D_{Hi}}{\partial AGE_i} < 0, 0 < \frac{\partial D_{Hi}}{\partial AGE_i^2} < 0, 0 <, 0 < \frac{\partial D_{Hi}}{\partial GE_i} < 0, 0 < \frac{\partial D_{Hi}}{\partial MS_i}$$
$$< 0, < 0, \frac{\partial D_{Hi}}{\partial EA_i} > 0, 0 < \frac{\partial D_{Hi}}{\partial EMP_i} < 0, \frac{\partial D_{Hi}}{\partial Y_i} > 0, 0 < \frac{\partial D_{Hi}}{\partial HHZ_i} < 0$$

That is, we expect individuals whose place of residence is far from the location of heath facility will have less access to healthcare. Those who can afford health payments are also expected to have better access to healthcare. The stock of health capital depletes with age so older persons will often time demand for more healthcare. But we cannot predict if older persons have better access to healthcare or not. The role of gender in healthcare demand cannot be defined with certain expectations. It depends on health capital stock and individual preferences or sometimes natural demands such as giving birth. The expected effects of marital status cannot also be out rightly stated. Persons who are married may be able to pull resources and demand more healthcare when it is needed. On the other hand, emotional support from spouse provides mental balance and reduced chance of illness and consequently less demand for health. More educated persons are likely to earn more income and hence have better access to healthcare. Persons who earn higher income are expected to have better access to care provision as they can readily afford it. For employed persons, the use of healthcare is expected to be positive because they are financially empowered however across employment types the likelihood of utilization cannot be determined outrightly. The expected effect of household size cannot also be deciphered. Regardless of the size of the household, the utilization of healthcare will be based on affordability. However, persons from large households are vulnerable to illness particularly when it is communicable.

Similar predictors of healthcare accessibility adopted by Roll *et al.* (2012) and Sriram and Noochpoung (2018) for waiting time modelling were applied to estimate:

$$W_i^h = W_{Q_i^h}\left(HD_i, P_{hi}, AGE_i, AGE_i^2, GE_i\, MS_i, EA_i, EMP_i, Y_i, HHZ_i\right) \tag{2}$$

where W_i^h, waiting time in minutes for use of healthcare by an individual $_i$.

A priori expectations, in this case, are such that $\frac{\partial Q_i^h}{\partial DH_i} > 0$, $\frac{\partial Q_i^h}{,P_{hi}} < 0$, $0 < \frac{\partial Q_i^h}{\partial AGE_i} < 0$, $AGE_i^2 < 0\,0 < \frac{\partial Q_i^h}{\partial GE_i} < 0, 0 < \frac{\partial Q_i^h}{\partial MS_i} < 0, 0 < \frac{\partial Q_i^h}{\partial EA_i} > 0, 0 < \frac{\partial Q_i^h}{\partial EMP_i} < 0, \frac{\partial Q_i^h}{\partial Y_i} < 0, 0 < \frac{\partial Q_i^h}{\partial HNZ_i} < 0$.

That is, we expect that individuals whose place of residence is far from the location of the health facility will most likely arrive late at the health centre and hence may experience a longer waiting time. The higher the price for healthcare, the shorter the waiting time. We

expect that older persons may be given quick attention due to age so that they spend less waiting time before seeing the health practitioner. The role of gender in the waiting time of care received cannot be defined with specific expectations. Similarly, the expected effect of marital status cannot be out rightly defined as well as the effect of educational attainment and employment. Persons who earn more income will more likely spend less time because health workers can sometimes give them preferential treatment. The expected effect of household size cannot be determined outrightly. Equations 1 and 2 are estimated separately for persons who demand for preventive care comprising preventive care not related to pregnancy, pregnancy and prenatal care, giving birth, and curative care for illness or injury. The results are shown at National, Urban and rural level estimates.

The dependent variable in equation (1) is a binary response variable thus, we use the Logit model, which lends itself naturally to the maximum likelihood estimation technique. Estimates are provided using the logistic regression that provides coefficients as the odds ratio so that we model the outcome

$$\text{logit}\,(\text{p}) = \log(p/(1-p)) \tag{3}$$

where p is the proportion of observations with an outcome of 1, and $1-P$ is the probability of an outcome of 0. The ratio $\frac{P}{1-P}$ is called the odds and the logit is the logarithm of the odds, the logistic model quantifies the effect of a predictor in terms of a log-odds ratio using maximum likelihood estimation (MLE) (Hailpern and Visintainer, 2003; Jang, 2021; Ponce *et al.*, 2006). The probability of the occurrence of an event can also be determined using the odds ratio. In this case, where

$$\text{odds} = \text{probability}/1 - \text{probability} \tag{4}$$

$$\text{probaility} = \text{odds}/1 + \text{odds} \tag{5}$$

Oftentimes, waiting time has been considered using count data models. This is because time waited is usually a non-negative integer. The benchmark for count data models is the Poisson. Cases of over dispersion in such models require variants of the Poisson model such as the negative binomial or zero-inflated Poisson model (Maddala, 1986; Long, 1997). Studies by Siciliani and Verzulli (2009) and Roll *et al.* (2012) modelled waiting time as count data.

Of the model types presented for dealing with the non-normality of waiting time, it is argued that the GLM is a preferred option. A comparison of models used for examining waiting time isolates the GLM and counts data models as preferred. Other model types are shown to have biased estimates and large standard errors. Given the nature of waiting time as counts, we model equation (7) as count data and examined the distribution for the existence of over dispersion.

In modelling waiting time as count observation Y, the Poisson model is stated as:

$$Y_i = \exp(X_i B) + \varepsilon_i \tag{6}$$

Equation is estimated using the maximum likelihood technique given as:

$$LogL(B) = \sum_{i=1}^{n} Y_i X_i B + \exp(X_i B) - \ln\left(Y_i^{!}\right) \tag{7}$$

Given the underlying assumption of equal mean and variance for a Poisson model, cases of under or over dispersion where the variance is less than or greater than the mean requires the use of variant of the Poisson model such as the Negative Binomial Regression Model (NBRM), especially where there are no excess zeros in the count observation (Cameron and Trivedi, 1998; Lakshminarayanan, 2009).

3.2 Data source

Data for this study is from wave 3 of the 2015/2016 post-harvest General Household Survey (GHS) data in Nigeria. The GHS Wave 3 data is a nationally representative survey of 4,581 households and collects data on household characteristics, welfare and agricultural activity (NBS, 2016). The GHS provides a rich source of information on individual and household characteristics such as educational attainment, religion, language primary spoke at home, gender, marital status, and expenditure on food and non-food consumption. Other sections of the data provide information on individual and household health, labour employment, attitude, welfare and agriculture. Data for food and non-food expenditure is used as a proxy for income while language primarily spoken at home as a measure for ethnicity. Information on gender, religion and educational attainment are extracted from the section on individual and household characteristics.

Respondents were asked to state whether they consulted a health practitioner, dentist, traditional healer, patent medicine vendor or visited a health centre 4 weeks preceding the survey also asked to state the reason for such visit whether for preventive care not related to pregnancy, prenatal check-up, giving birth, follow up appointment for illness or injury, new injury or illness among others, which were grouped into preventive care and curative care. In terms of care received, respondents were also asked to state whether consultation was with a health practitioner, traditional healer, faith-based centre, spiritualist, or patent medicine vendor and waiting time before consultation took place. Questions on user fees require a response to how much was paid for consultation, drugs or medicine over the counter and whether such payment was made by the individual or other means such as the spouse or relative, government or employer, NGO or other private insurance. To appropriately capture user charges, we only made use of payments made by the individual.

4. Results

The descriptive statistics of the GHS data set used for the study containing 26,176 data points covering various household issues are presented in Table 1. Over the survey period, about 8% of the respondents (1,916) had cause to visit health centre. Also, the data contains two categories of dependent variables and eleven independent variables. Six of the independent variables (sex, place of residence, marital status, educational attainment, employment status and type of healthcare service) are categorical, while the remaining five (user fees, distance to hospital in minutes, age of respondent, household size and total income) are measured as continuous variables. On average, user fees of 1,767NGN (equivalent to 4.91USD) covering consultation, drug consumption, diagnostic test and hospital bed admission were paid. With relatively high standard deviation of 14,473NGN, a wide disparity exists in terms of how much is paid to access care. This shows that, on average, a large proportion (more than 28%) of income is used to pay for healthcare services. However, respondents spend approximately the same travel time in minutes to the hospital as the waiting time in minutes before being attended to. The waiting time at health facilities, which has opportunity cost in terms of productivity loss was about 35 min on average while it required about 28 min on average to get to hospital from the residence of the respondents. However, the standard deviation is higher at 69.5 min for waiting time, compared to 36.8 min for hospital distance.

4.1 Access to preventive and curative healthcare services

The outcomes of the logistic regression analysis that estimates the odds that respondents accessed preventive healthcare at national, urban and rural levels as presented in Table 2. Among the categorical variables, the reference category is chosen to be the variable with the highest observations, which include male, never married, tertiary education and not available

Variable	Description	Observation (%)
Dependent		
Access	Those who visited a health centre	1,916 (7.93)
WaitTime	Duration of waiting before being attended to at the centre Mean (S.D)	34.87 (69.46)
Independent (Categorical)		
Sex		
Male	= 1 if male, 0 otherwise	13,526 (50.69)
Female	= 1 if female, 0 otherwise	13,160 (49.31)
Place of residence		
Urban	= 1 if urban resident, 0 otherwise	7,580 (28.33)
Rural	= 1 if rural resident, 0 otherwise	19,106 (71.60)
Marital status		
Never married	= 1 if never married, 0 otherwise	16,814 (64.23)
Married	= 1 if married, 0 otherwise	8,005 (30.58)
Single-Spouse	= 1 if divorced, separated or widowed, 0 otherwise	1,368 (5.18)
Education		
Non-formal	= 1 if non-formal education, 0 otherwise	6,569 (37.14)
Primary	= 1 if primary education, 0 otherwise	4,288 (24.24)
Secondary	= 1 if secondary education, 0 otherwise	5,063 (28.62)
Post-secondary	= 1 if post-secondary education, 0 otherwise	1,769 (10.00)
Employment		
Paid job	= 1 if wage employment, 0 otherwise	1,309 (5.57)
Self-employed	= 1 if self-employment., 0 otherwise	8,560 (36.41)
Unemployed	= 1 if unemployed, 0 otherwise	719 (3.06)
Not available	= 1 if not available for employment, 0 otherwise	12,925 (54.97)
Service		
Preventive	= 1 if preventive care service., 0 otherwise	500 (26.10)
Curative	= 1 if curative care service., 0 otherwise	1,416 (73.90)
Independent (Continuous)		
UserFees	Amount paid at the health centre (including consultation, drugs, investigation and admission charges) Mean (S.D)	1766.54 (14473.22)
HospDist	Distance to health centre (in minutes) Mean (S.D)	27.70 (36.76)
Age	Age expressed in years Mean (S.D)	24 (20.0)
Hhsize	Household Size Mean (S.D)	8.91 (3.98)
Total_inc	Income Mean (S.D)	7889.02 (124911.9)

Table 1. Description statistics of study variables (n = 26,176)

for employment. The results show that an increase in user fees raises the odds of hospital visitation for preventive care by 56.1%, 47.6% and 60.0% at the national, urban and rural levels, respectively. Increasing age reduces the odds of hospital visitation for preventive healthcare services by 5%, 10% and 2% at national, urban and rural levels, respectively. The gender coefficients show that odds of females for a hospital visit for preventive healthcare are 52.2 and 63.1% higher than males at the national and rural levels, respectively.

Relative to the never married group, married individuals exhibited greater odds of hospital visitation for preventive healthcare by 8.2%, 12.1% and 17.4% at national, urban and rural levels, respectively. Similarly, single spouse status essentially influences hospital visitation for preventive healthcare services. Compared to the never married individual, the

Table 2.
Logistic regression estimates of user fees and access to healthcare services

Variables	Preventive services			Curative services		
	National	Urban	Rural	National	Urban	Rural
ln_user	1.561 (8.84)***	1.476 (4.44)***	1.600 (7.49)***	1.541 (8.76)***	1.727 (6.20)***	1.478 (6.45)***
HospDist1				1.000	1.000	1.000
Age	0.949 (2.96)***	0.895 (3.46)***	0.975 (1.19)	0.974 (1.73)*	0.930 (2.48)**	0.989 (0.64)
AgeSq	1.001 (3.46)***	1.001 (3.59)***	1.000 (1.65)*	1.000 (2.83)***	1.001 (2.77)***	1.000 (1.73)*
Gender						
Female	1.522 (2.64)***	1.373 (1.16)	1.631 (2.48)**	1.258 (1.61)	1.347 (1.12)	1.225 (1.19)
Marital Status						
Married	5.082 (4.79)***	16.121 (4.31)***	3.174 (2.95)***	1.090 (0.29)	2.046 (1.35)	0.847 (0.47)
single_spouse	4.513 (3.57)***	11.098 (3.12)***	3.053 (2.23)**	1.440 (0.96)	2.834 (1.54)	1.129 (0.27)
Education						
nonformal_edu	0.550 (2.50)**	0.517 (1.51)	0.580 (1.90)*	0.926 (0.42)	0.685 (0.97)	1.041 (0.19)
pry_edu	0.766 (1.33)	0.729 (0.95)	0.778 (0.98)	0.905 (0.50)	0.894 (0.31)	0.946 (0.23)
sec_edu	0.842 (0.87)	0.471 (2.06)**	1.220 (0.83)	0.869 (0.69)	0.700 (1.00)	1.050 (0.19)
Employment						
wage_emp	0.815 (0.70)	0.762 (0.60)	0.881 (0.32)	0.705 (0.96)	1.993 (1.27)	0.241 (2.16)**
self_emp	0.668 (2.38)**	0.663 (1.31)	0.688 (1.82)*	0.638 (2.57)**	0.910 (0.26)	0.551 (2.92)***
unemployed	0.547 (1.00)	0.409 (0.85)	0.718 (0.45)	0.870 (0.32)	2.613 (1.73)*	0.240 (1.40)
ln_inc	1.031 (1.52)	1.040 (1.17)	1.026 (1.01)	0.999 (0.04)	0.977 (0.55)	1.016 (0.57)
hhsize	0.984 (0.79)	1.012 (0.37)	0.968 (1.30)	1.019 (1.14)	1.046 (1.58)	1.001 (0.02)
Observation	8,378	2,896	5,482	8,401	2,891	5,510
Log likelihood	−912.98	−307.35	−596.54	−1,042.33	−305.81	−724.19
Pseudo R-squared	0.11	0.14	0.11	0.06	0.10	0.06
LR χ^2	231.34	103.03	146.48	137.20	69.65	89.66
Prob > χ^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note(s): Odds ratio reported with *z*-statistic in parenthesis; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$
Reference categories: Gender = male; Marital Status = never married; Education = Tertiary Education; Employment = not available for employment

odds of hospital visitation by single-spouse for preventive healthcare services are higher by 51.3%, 9.8% and 5.3% at national, urban and rural levels, respectively. Education remains a relevant influence on health-seeking behaviour for preventive healthcare. The odds of hospital visitation for preventive healthcare by people with non-formal education are lower by 45.0 and 52.0% at the national and rural levels respectively. In addition, the odds of hospital visitation for preventive healthcare by individuals with secondary education are lower by 52.9% at urban level. On employment, the odds of hospital visitation for preventive healthcare service by a self-employed individual are 33.2 and 31.2% lower at national and rural levels, respectively than for those not available for employment.

For curative healthcare services, the results revealed that an increase in user fees increases the odds of hospital visitation by 54.1%, 72.7% and 47.8% at national, urban and rural levels, respectively. As people get older, the odds of accessing curative healthcare services reduced by 2.6 and 7% at national and urban levels, respectively. In addition, compared to individuals not available for employment, those in wage and self-employment were found to exhibit lower odds for hospital visitation for curative care, while estimates for rural level analysis showed that the odds of accessing curative healthcare service is 75.9%, which is lower for persons in wage-employment than those not available for employment.

4.2 Waiting time for use of preventive and curative healthcare services

The result for the effect of user charges on the waiting time for use of preventive care is presented in Table 3. The estimate of the log of the dispersion parameter alpha is significantly greater than zero, showing that the data for waiting time is over dispersed and is better estimated using a negative binomial model than a poison model. The results show that user fee significantly explains waiting time for healthcare at national and rural levels. A rise in user charges for preventive care increases the incidence rate of waiting time by 15 and 17.7% at national and rural levels, respectively. Distance to the location of the healthcare facility is also seen to be statistically significant. The result at the national level showed that for every one-minute increase in hospital distance, the incidence rate for waiting time would be expected to increase by 0.8%. However, the rate of waiting time for preventive care due to distance is higher for urban dwellers 0.8% than for rural dwellers 0.7%.

Rural level estimates for the effect of gender on the waiting time of preventive care received shows that female is expected to have a longer waiting time at the healthcare facility than male. At educational level, incidence of waiting time was reduced for those with no formal education by 46.4% at urban level only, compared to those with tertiary education. For the effect of employment status of those seeking preventive healthcare services on waiting time incidence, there was a 35.1% decrease for those who are self-employed at rural level when compared to those who were not available for employment. At the national level, the result shows that for every one person increase in household size the rate for waiting time is expected to increase by 3.9%. A similar finding is observed in rural estimates with each individual addition to household size inducing waiting time rate increase by 4.1%.

The result for the effect of user charges on the waiting time of curative care is presented in Table 3. At the national level, for every unit increase in the user fee paid, the incidence of waiting time increased by 6.3%. This was also evident among rural dwellers as user charges paid increased the waiting time incidence by 9.7%. In addition, estimates of distance to facilities show that a minute increase leads to an increase in waiting time by 1.7% at both urban and national levels respectively. The same scenario played out in location of residence but was particularly higher in rural at 2.0%. In addition, as people get older, the waiting time incidence increased by 2.7%.

The waiting time incidence for females decrease by 11.1 and 12.3% at national and rural levels, respectively when compared to males. It reduced for those with primary education by

Table 3.
Negative binomial regression estimates of user fees and waiting time

Variables	Preventive services			Curative services		
	National	Urban	Rural	National	Urban	Rural
ln_user	1.150 (2.75)***	1.036 (0.47)	1.177 (2.61)***	1.063 (2.54)**	0.987 (0.29)	1.097 (3.27)***
HospDist	1.008 (3.09)***	1.008 (1.70)*	1.007 (2.58)***	1.017 (12.12)***	1.017 (5.46)***	1.020 (12.13)***
Age	0.996 (0.25)	0.974 (0.80)	0.993 (0.35)	1.007 (0.90)	1.027 (1.83)*	0.991 (1.03)
AgeSq	1.000 (0.03)	1.000 (0.75)	1.000 (0.23)	1.000 (0.64)	1.000 (1.75)*	1.000 (0.94)
Gender						
Female	1.201 (1.14)	0.963 (0.14)	1.410 (1.73)*	0.889 (1.71)*	0.823 (1.54)	0.877 (1.68)*
Marital Status						
Married	1.612 (1.36)	1.934 (1.05)	1.876 (1.53)	0.997 (0.02)	1.377 (1.20)	0.965 (0.20)
single_spouse	0.916 (0.19)	1.899 (0.82)	1.012 (0.02)	0.914 (0.45)	0.998 (0.01)	1.012 (0.05)
Education						
nonformal_edu	0.826 (0.87)	0.536 (1.93)*	0.941 (0.23)	1.048 (0.57)	1.149 (0.92)	1.001 (0.01)
pry_edu	1.175 (0.74)	1.252 (0.64)	1.588 (1.59)	0.869 (1.34)	0.527 (3.36)***	1.100 (0.78)
sec_edu	1.004 (0.02)	0.896 (0.35)	1.148 (0.46)	1.192 (1.50)	0.964 (0.18)	1.300 (1.83)*
Employment						
wage_emp	1.122 (0.28)	1.634 (0.87)	0.610 (0.83)	0.929 (0.35)	0.456 (2.39)**	2.223 (2.81)***
self_emp	0.963 (0.19)	1.669 (1.64)	0.649 (1.82)*	0.786 (2.88)***	0.705 (2.11)**	1.025 (0.24)
unemployed	0.786 (0.47)		0.934 (0.13)	0.494 (2.92)***	0.414 (2.56)**	0.605 (1.46)
ln_inc	1.000 (0.00)	0.987 (0.36)	1.031 (0.86)	1.013 (0.88)	1.024 (0.87)	0.964 (2.21)**
hhsize	1.039 (2.00)**	1.054 (1.64)	1.041 (1.84)*	0.997 (0.39)	0.978 (1.57)	1.012 (1.19)
Observation	243	62	181	1,276	356	920
Log likelihood	−1127.11	−306.43	−801.32	−5596.67	−1624.77	−3933.51
Pseudo R-squared	0.02	0.03	0.02	0.02	0.02	0.03
LR χ^2	44.39	20.96	40.96	266.13	69.65	260.53
Prob > χ^2	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000

Note(s): Incidence Rate Ratio reported with z-statistic in parenthesis; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Also, there was no data available for urban unemployed for preventive Services
Reference categories: Gender = male; Marital Status = never married; Education = Tertiary Education; Employment = not available for employment

47.3% at urban level only, compared to those with tertiary education. In the same vein, those with secondary education in rural areas have a 30.0% increase in the waiting time incidence than those with tertiary education. There was 54.4% decrease for those in wage employment at urban level while it increases by 22.3% in rural area when compared to those who were not available for employment. For household income level, there was 3.6% decrease in waiting time incidence at the rural level.

5. Discussion

The results suggest that user fee appears not to be detrimental to hospital visits; rather access to preventive healthcare is boosted along with an increase in user fees. An increase in user fees increased the odds of hospital visitation for preventive healthcare services, which is slightly higher for the urban than rural sector. This result is contrary to those of earlier studies showing increase in access to preventive healthcare with removal of user fees (Koch, 2012; Manthalu *et al.*, 2016; Leone *et al.*, 2016). In the case of Nigeria, the plausible reason is that illnesses are not always prevented at an early stage until they deteriorate and become life-threatening. At this point treatment become costly and visit to hospital will be increasingly regular.

Furthermore, the results showing higher odds of females for hospital visit for preventive healthcare than males are indicative of higher vulnerability of females in rural settings, implying greater need to access preventive healthcare, especially for pregnancy-related care. The finding for marital status can be associated with pregnancy-related care, as well as post-delivery child healthcare being part of preventive healthcare that is more common for married persons relative to those who were never married. The results showing higher odds for use of care by educated persons suggest that lack of education tends to negatively affect access to preventive healthcare. Those who are without formal education tend to consider accessing preventive healthcare compared to those their educated fellows. This buttresses the assertion that those who are educated often value their health more and are more prone to maintaining good health conditions by inculcating positive health behaviour and accessing preventive healthcare.

Higher user fee is found to be associated with increased access to curative care. While these results may appear counterintuitive, they may be reflecting the fact that those who had greater illness severity ends up not only exhibiting greater urgency to access curative care but also attracting higher user fee due to higher cost of treatment. The impact of user fees is stronger in rural than urban areas. This can be explained by the fact that most free healthcare programmes are oftentimes implemented in rural areas. Charges for healthcare are commonly higher in rural than urban areas where demand is generally higher. Hence access to healthcare can be higher in rural than urban areas. Findings for this study on the effect of user fees on access to curative care vary from those in the literature showing reduction in utilisation of healthcare services with imposition of user fees specifically for curative healthcare (Watson *et al.*, 2016).

Noting that average age of respondents in the study sample is 24 years, which is a youthful age distribution, the results revealed that access to curative healthcare reduces with aging, which reflects that youths are relatively less vulnerable to health problems compared to children. Findings show that being available for employment reduces the need for curative healthcare probably due to physical engagement of such persons in productive activity that can reduce the need for curative care. However, the challenges with unemployment, such as physical and emotional stress may negatively affect health status of the individuals in this category in countries such as Nigeria where there is high level of unemployment.

Additionally, the results suggest that imposition of user fees does not reduce waiting time for receiving healthcare. Thus, argument of user fees generating funds for the provision of

more healthcare facilities, and employment of medical personnel among other things is not likely the case in Nigeria. This is contrary to expectation and can possibly be due to high incidence of corruption, by which funds from user charges are diverted from their intended objective. This result is however consistent with earlier findings showing that user fee does not contribute to improvement in the delivery of healthcare service provision (Abdelmaged (2021), Johnson *et al.*, 2012; Sengupta *et al.*, 2019).

Findings also suggest that persons whose place of residence is far from the location of the healthcare facility are more likely to wait longer to receive care than those whose place of residence is closer. Given that the arrival rate is faster than service rate, the build-up of the queue at the service facility turns out to be to the disadvantage of those patients from longer distances, who tend to arrive relatively late, given the long time it takes to cover the distance to the hospital. This indicates that patients from long distance may not get adequate attention from physician due to exhaustion from attending to many patients. The result that females experienced waiting time that is higher than males is similar to findings by Sriram and Noochpoung (2018) but differs from that of Arnesen *et al.* (2002).

The individuals from larger households experiencing longer waiting time may be attributed to financial constraints to cater for the needs of large families, thus delaying the time for hospital visit. Time constraints to family needs may also explain the longer waiting time due to long queues before accessing physician consultation and other healthcare needs at the health facility. Also, marital status, age, income and education do not influence the incidence of waiting time at the health facility. This contradicts findings by Roll *et al.* (2012) and Monstad *et al.* (2014), which showed statistically significant effects of these variables on waiting time. Differences in data sample and estimation technique can induce variation in findings relative to earlier results.

The results suggest that the imposition of user fees does not reduce waiting time of curative healthcare services in Nigeria. This finding is also like those by Sengupta *et al.* (2019). As noted by Johnson *et al.* (2012), it can sometimes lead to delay in presentation of care which can inarguably result in longer waiting time before administration of health services. Finding for distance suggests that the more minutes an individual takes to reach a healthcare facility; the longer is the likelihood of his/her waiting time. The result showing longer waiting time as people get older is intuitive. As people get older, seeking for curative healthcare services due to illnesses that come with age becomes very important. Many people in this category require medical attention which may suggest that they will wait for longer time due to inefficient healthcare system in the country.

Beyond the policy implication, the findings provide insight into the debate on healthcare financing and health outcomes research nexus. Given the domination of the curative healthcare services and insufficient public healthcare funding in Nigeria, the imposition of user fees as a core component of healthcare financing poses a further threat to the worsening health outcomes of the residents. This can be further explored in future research.

6. Conclusion

This study examined the effect of user fees on access and waiting time for use of healthcare services in Nigeria at the national, urban and rural levels. Using 2015/2016 GHS data set, access to healthcare was measured using hospital visits while waiting time was measured as time spent in the health facility in minutes before receiving medical attention. The logistic regression and negative binomial regression were applied in examining the effect of user fees on access and waiting time of healthcare, respectively. The results are provided for preventive and curative care. Findings showed that the imposition of user fees in Nigeria increases access to both curative and preventive care regardless of place of residence. On the other hand, such imposition increases waiting time of care received. Findings suggest that

user fee in Nigeria does not debar access to healthcare. Apparently, individuals can afford payment for healthcare even with user fee imposition. However, the waiting time for care received remains high even with the imposition of user fees. Poor healthcare delivery is detrimental to health conditions and limits household income earning ability and consequently macro-economic output. The result suggests that abolition of user fees will further raise access to healthcare, particularly because individuals can access healthcare services regardless of amounts paid. Since government policy shaped the behaviour of individuals, it is suggested that government needs to address poor health service delivery for the individuals to enjoy value for the services they are paying for. Rather than focusing on removal of user fees, it is advisable for government to improve existing health infrastructure such that individuals can easily access quality health service within shorter time.

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