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Health facility choice and evidence of facility bypass in Nigeria

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Abstract

Using the panel component of the General Household Survey we examined health care facility choice among Nigerians. Our analysis focused on access to, and choice of facility under different scenarios. When individuals in all socio-economic groups are presented with one facility at a time, we find that private health facilities are the most popular. However, when all the health care facilities are simultaneously made available to all socio-economic groups, the predicted probabilities from multinomial probit model show that individuals in the richest socio-economic group are twice as likely to go to a private health facility as the individuals in the poorest group. Surprisingly, all income groups choose spiritual/religious institutions ahead of public health facilities when presented with all categories of facilities. When a poor person chooses to bypass a less costly public facility and pay for care further away, such action is especially bothersome. This phenomenon of bypassing cheaper medical care for more expensive care is indicative of the tremendous task ahead of policymakers in providing accessible and quality care.

Keywords: Health care facility choice, Facility bypass, Multinomial probit model, Socio-economic status index
JEL Classification: I110, I140, I180

1.0 Introduction

Despite the strong empirical evidence between a healthy population and robust economic growth, it is surprising that very few, nationally representative studies have been done on the state of health care delivery in Nigeria, Africa's most populous country. With an estimated population of 202 million (World Bank, 2019) and national poverty headcount ratio of 40.1% (World Bank, 2019), Nigeria is categorized as a lower middle-income country by the World Bank. Unlocking the potential of the country in terms of quality health care delivery is one of the paths to economic prosperity. The Nigerian health sector is beleaguered not just by a paucity of funds, but also by the lack of policy cohesion and manpower (Federal Ministry of Health, 2014). The executive summary of the Revised National Health Policy states that Nigeria is falling behind in health-related components of the UN's Millennium Development Goals (MDGs).

This paper uses nationally representative data to highlight the issues of affordability, quality, pattern, and modes of health care delivery in Nigeria. Although a thorough, empirical analysis of the economics of why most people in Nigeria cannot afford quality medical care is outside the scope of this paper, the nexus between the socio-economic status of the users and the patterns of use of health care facilities in the country are of interest to policy makers, and this link is extensively discussed in this paper.

Indeed, a far more challenging and daunting task lies in the analysis of the structural problems of the Nigerian health care sector and subsequent reforms that must be implemented. As noted by Duflo et al. (2004), reforming a dysfunctional system is a very challenging task. For instance, Nigeria accounts for 20% of the global burden of maternal deaths- 60,000 women die yearly from pregnancy-related causes (WHO, 2019). Nearly one million children die before their fifth birthdays (The Federal Ministry of Health, 2014). There is an average of one doctor per 30,000 people, and two hospital beds per 1,000 (National Population Commission and ICF International, 2014). The health sector does not fare better in terms of procurement, storage and dispensing of drugs. Patent medicine vendors (PMVs) outnumber pharmacists by a ratio of 20:1 (Adikwu, 1996). PMVs, mostly professionally untrained in drug handling (storage, distribution, and dispensation), usually combine the job functions of the doctor, the nurse, and the pharmacist. Just 13% of PMVs believe that a key law which stipulates that some drugs be sold only on prescription is followed at all times by other PMVs (Brieger et al. , 2004).

Finally, this paper looks at the issues of affordability and the quality of care received by various socio-economic groups. For instance, which socio-economic group will be adversely affected by the introduction of user fees in the public health system? Will users of primary health care centers (PHCs) be affected by any change in the user fee?

This paper constructs and uses a socio-economic status (SES) index as a proxy for income and standard of living. The justification for using SES index as a proxy for income and standard of living is quite straightforward: the lack of resources on the part of the government to collect accurate income data, and special economic arrangements such as sharecropping (Vyas and Kumaranayake, 2006).

Our findings show that individuals in the poorest socio-economic group are likely to use public health facilities more than other socio-economic groups. In addition, we find that individuals in the richest group use private hospitals more than other socio-economic groups. Specifically, individuals in the upper quintile of the socio-economic status index are predicted to prefer private health facilities to public health facilities by twice as much as the poorest group. Individuals in the poorest group are predicted to prefer public health facilities to private health facilities by a ratio of about 1.1:1. Other results from this study show all socio-economic groups across Nigeria consult patent medicine vendors.

2.0 Data and Methods

2.1 Health and the General Household Survey Panel (GHSP)

The survey data used for this paper comes from the panel component (NGHSP) of the Nigerian General Household Survey (NGHS). The NGHSP is a nationally representative sample of 5,000 households done biennially. Just as the parent NGHS, NGHSP covers all 36 states and Abuja, the Federal capital territory of Nigeria. The NGHSP was introduced in 2010 as a subsample of the NGHS. It focuses on gathering additional data on agricultural, other households' income, expenditure, and consumption. The NGHSP is designed by the National Bureau of Statistics (NBS) in conjunction with the World Bank (WB), Bill and Melinda Gates Foundation (BMGF) and other Nigerian government agencies.

The household questionnaire provides information on demographics; education; health (including anthropometric measurement for children and child immunization); labor and time use; food and non-food expenditure; household nonfarm income-generating activities; food security and shocks; safety nets; housing conditions; assets; information and communication technology; and other sources of household income.

Data are collected under two broad categories in two visits: post planting and post-harvest. In each period, data collection is done at the household, community, and agricultural output levels. The Post planting data are collected between August and November during the planting of agricultural produce while the post-harvest questionnaires are administered between February and April in each wave.

The NGHSP Community Questionnaire solicits information on access to infrastructure; community organizations; resource management; changes in the community; key events; community needs,; actions, and achievements; and local retail price information..

2.2 Estimation Issues

Like most household surveys, the NGHSP lacks some micro level data, three of which may affect the quality of the estimated parameters in this study: lack of data on the nature of the diseases affecting each user of health care in Nigeria, lack of exogenous price data of health care and unknown quality of health care each user receives. In the first case, health care is treated as a homogenous good in the survey. But this problem may be mitigated by following the general pattern of health care usage among the members of a household. For example, most serious medical conditions like heart attacks are treated at teaching hospitals and less serious tropical diseases like malaria are treated at primary health centers (PHCs). Since the NGHSP survey includes questions on the establishment where treatment takes place, a dummy variable can be used to control for the nature of illness of each user conditional on where treatment is sought. More so, the availability of control variables (see Table 4) such as the impact of illness/injury on one's daily activities, and the number of nights a user spends in a health facility can be analyzed as indications of severe ill-health.

Some general surveys use users' health care expenditure as the price data (Akin et al., 1995). Health care expenditure includes user fee, cost of transportation to and from the health facility, consultation fee, prescription- and over-the-counter drug purchases and admission. Health care expenditures are, however, endogenous to health care facility choice. To overcome this problem, we use instrumental variable probit (IVPR) model and instrumental multinomial probit model.

Measurement error in the quality of health care is a common problem in survey data due to the lack of supply-side information (Akin et al., 1995). While Akin et al. (1995) uses supply-side data on overhead cost of health care providers as the measure of quality, this overhead cost is not available in the NGHSP. In the absence of data on the supply-side data on health care, Akin et al. (1995) suggest that the number of doctors, and the number of days health facilities remain open during the week across a community, can be used as indicators of quality of health care delivery. Following Duflo et al. (2004), we use the number of days a health facility opens in a week and availability of health facilities at community level are used as quality indicators of quality of health care delivery.

2.3 Sample Statistics

The per capita household expenditure on weekly food purchase, electricity, meals taken away from the home, mobile phone recharge card, education and nonfood expenditure is N10,966.92 (about $67.70 or $9.67 per day)[1] in 2012 dollars. However, 78% of the respondents live in households in which the per capita weekly expenditure is less than the national average ($67.70). The average age of household heads in the sample is 51.43 years and 85% of the households are headed by a male. Approximately 49.53% and 50.47% of the sample are males and females respectively. 15% of male household heads have no formal educational qualification while the number is 25% for female household heads. 68.4% of the household members in the sample are not currently married while 63.99% have never been married. The average household size in the sample is 6.06. Children under twelve constitute about 73% of household members. 11% of the respondents visited the doctor in the last 30 days. The summary statistics are presented

VARIABLES	N	Mean	SD
Male (=1)	58,508	49.60%	0.5
Average HH Size	9,683	6.06	3.258
Children under 12 years old in HH	9,683	73%	0.444
Male adult over 50 years old in HH	9,683	27.75%	22.02
HH member Visited the doctor (=1)	9,351	10.98%	0.366
Average Per Capita HH expenditure (USD)	61,539	67.7	14.14
Average Weekly Medical Cost (USD)	18,247	15.9	10.24
Can do vigorous Activities (=1)	54,144	87.53%	0.331
Has difficulty seeing (=1)	54,431	1.80%	0.133
Has difficulty climbing staircase (=1)	54,408	3.30%	0.179
Has speech impediment or difficulty (=1)	54,124	1.72%	0.13
Male headed HH (=1)	9,678	85.30%	0.354
Not currently Married (=1)	57,272	68.40%	0.545
Has never been Married (=1)	57,272	63.91%	0.52
Weekly expenditure less than national average (=1)	62,844	78.72%	0.41
Age of HH head (years)	62,844	51.43	20.14

Table 1: Summary statistics

2.4 Socio-economic Status Index

In terms of socio-economic index, principal component analysis is used in this study to generate weights for asset and animal ownership by the households (Filmer and Pritchett 2001; Mckenzie 2003). A separate socio-economic score is generated for rural and urban Nigeria by using the formula:

$$X_i = \gamma_1\left(\frac{y_1 - \underline{y_1}}{\sigma_1}\right) + \gamma_2\left(\frac{y_2 - \underline{y_2}}{\sigma_2}\right) + \cdots + \gamma_k\left(\frac{y_k - \underline{y_k}}{\sigma_k}\right)$$

Where X_i is the social score for household$i$, $\underline{y_k}$ and σ_k are the mean and standard deviation of asset y_k respectively, γ_k denotes the weight generated from the first principal component analysis[2]. The assets used for the construction of the SES index in this paper include ownership of durable household items such as television, bicycle, computer, radio, and cell phone. Ownership of farmland and animal holdings, alongside the type of dwelling, sources of drinking water during the dry season, sanitation and type of cooking utensils used in the household are included in the construction of the SES index (see Appendix A for the full SES index components).

Expectedly, there are more poor households in the rural sector than in the urban sector (Table 2). The higher the economic status of a household, the higher the implied SES score of that household (Table 3). Thus, a household with more durable assets, better sanitation, pipe borne water and tiled floor will generally have a higher SES score than a household with less durable assets, poor sanitation, unclean drinking, and a mud-earth floor. Also, assets that are commonly owned by households will have a very little or negative weights in the SES index. After generating the weight of each asset and normalizing the SES index score of each household, households are then classified into quintiles based on the SES score (the poorest, the poor, the middle class, the rich and the richest).

		Poorest	Poor	Middle	Rich	Richest
	N	Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	Q5 (%)
Urban	3250	10.73	21.69	19.47	24.25	23.57
Rural	6742	24.47	19.18	20.28	17.79	18.27

Table 2 By sector: proportion of households in each quintile subgroup

[1] We use an exchange rate of 1 USD= 162 Naira

[2] The command that generates the first principal analysis is available in Stata 13.

Sector	N	Poorest	Poor	Middle	Rich	Richest
Urban	3250	-1.939 (.406)	-1.062 (.224)	-.206 (.229)	.802 (.374)	3.204 (1.508)
Rural	6742	-2.026 (.390)	-1.002 (.238)	-.207 (.241)	.807 (.351)	3.082 (1.332)

Table 3: By sector: mean socio-economic score by quintile

3.0 Results

3.1 Health status, medical care, and providers

Indications of health status are shown in Table 4. Individuals in the poorest group are worse off in all the health indicators considered. Seven days prior to the interview, 9% of the individuals in the richest group (quintile 5) reported new illness/injury versus 16% in the poorest group. 91% (89%) of the richest group (poorest group) can do vigorous activities like running, climbing ladders, climbing stairs.

Table 4 also shows that 56% in the poorest group stopped their daily activities because of ill health compared to 44% for the richest sub-category. Since the marginal utility of $1 earned from an extra day of work is higher for the poor than the rich, the severity of the illness of individuals in the sample, irrespective of their socio-economic status, is random. In other words, Table 4 below suggests that heterogeneities in health conditions may not be a big estimation issue in this study. Furthermore, 9% of the richest in society report ill health, the rate of hospitalization is twice the 2% reported by the poorest.

Groups	PCE ₦	New illness	Can walk for 1 KM	vigorous activities	Stopped daily activities	Admitted
Poorest	3,047.05	0.16	0.89	0.84	0.56	0.02
Poor	5,092.94	0.13	0.91	0.87	0.53	0.02
Middle	6,913.47	0.14	0.90	0.88	0.50	0.03
Rich	10,483.99	0.09	0.91	0.89	0.46	0.03
Richest	25,202.19	0. 09	0.92	0.91	0.44	0.04

Table 4: Health Indicators, by SES index Distribution

Table 5 below shows the establishment where ill individuals sought medical service in the last 7 days. 67% of the people with new illness/injury in the lowest quintile sought help from a professional medical practitioner in the last 7 days while 70% of the people in the highest quintile did the same in the same period. Generally, there is a preference for private medical establishments among all income groups. In fact, as one moves up the quintile ladder, less and less people seek help from government hospitals. Individuals in the richest group are least likely to go to a government-owned hospital for health care. Religious establishments (otherwise known as "prayer warriors") seem to be the least likely destination for health care among all income categories.

Group	Average PCE (USD)[3]	Medical Consultation	Establishment of consultation		
			Govt.	Private	Religious
All	63.24	0.67	0.41	0.56	0.03
Poorest	18.81	0.63	0.46	0.51	0.03
Poor	31.44	0.66	0.47	0.49	0.04
Middle	42.66	0.65	0.41	0.56	0.03
Rich	67.72	0.7	0.35	0.63	0.02
Richest	155.57	0.7	0.36	0.61	0.03

Table 5: Consulted a medical practitioner in the last 7 days

However, the significance of the difference of the results between each income group under each health care provider in Table 5 can be validated by estimating a probit model and a multinomial probit model. These two models make different assumptions about the choice of health establishments facing patients. The probit model assumes that the sick individual is presented with just one choice, and the individual's choice is independent of other available choices. On the other hand, the multinomial probit model assumes that the individual is presented with all facilities at the same time in an unordered fashion, and the individual chooses. To address the econometric issues discussed earlier in this paper, the random-effects and endogenous versions of the probit and multinomial probit models are presented alongside their standard counterparts..

[3] Average PCE means Average Per Capita Household expenditure on food and non-food items in the last 7 days

3.2 Facility Choice: Model Specification and Results

3.2.a. Model Specification

When unordered outcomes arise from individual choices, they can be modeled with utility maximization models (Greene, 2012; Trivedi, 2010):

$$U_{ijt} = X_{1jt}{}'\beta_1 + Z_{ijt}{}'\alpha_k + V_{ijt}$$

where $i = 1,2,3..,N, k = 2,3,4,..,\alpha_k, j = 1,2,..,J. U_{ijt} =$ the utility that individual i faces from choice of health care at establishment j in period t. X_{1jt} is health care expenditure variable (the endogenous variable), Z_{ijt} is the covariate of exogenous variables facing individual i making choice j at time t, and V_{ijt} is the error term. Z_{ijt} includes age, age squared, dummies for each SES quintiles, a dummy for formal school attendance, a dummy for marital status, size of household, a dummy for under-12-year-olds in each household, per capita household expenditures (on food, non-food, housing, education and phone calls), a dummy for sector (rural versus urban areas), a dummy for the gender of the household head, the age of household head, a dummy for presence of a male adult 50 years old or older in the household, and log of healthcare expenditure.

Since health expenditure is endogenous in the model, suitable instruments which correlate with health care expenditure but are not directly correlated with provider choice are needed. Three instruments are used in this study: a dummy for whether a respondent can do vigorous activities, can walk more than one kilometer, or have difficulty communicating in the normal language of business in his community. These instruments directly affect earning ability, hence spending on health care. But ability to walk, speak or do vigorous activities do not directly determine the choice of a provider (private, government, or spiritual).

3.2.b. Facility choice

The original probit model and multinomial probit models' estimates are shown in Table 6. In order to more systematically examine the impact of all individual and facility type on bypassing decisions, it is necessary to do multivariate estimation so that the effect of each factor can be examined with all other factors statistically controlled. The random effects model estimates are presented in the lower portion of Table 6. Our estimates remain consistent when we also correct for the endogeneity of one's socioeconomic status through instrumental variable techniques.

Estimates of the probit model show that the poorest households use government health facilities more than other socio-economic groups if we assume that private health facilities and religious/spiritual institutions are not available. This result also holds under instrumental variable and random- effects probit models. On the other hand, if privately-owned health facilities are the only available options, all the socio-economic groups will use health care facilities more than the poorest group (second column of Table 6) and the biggest users of privately owned health facilities in this case are the individuals in the richest group (Q5). However, the results are not significant when it comes to spiritual/religious facility. The Wald test of the joint significance of the differences among the socio-economic group is significant.

Since economic policies are mostly about the choices that individuals face, making different types of health care facilities simultaneously available to the users is a more practical and realistic way of analyzing the facility choice decisions. The estimates of multinomial models are presented in the second half of Table 6. The second column of the second half of Table 6 implies that individuals in the poorest group are least likely to use private health care facilities when individuals in each socio-economic group must choose one of the three health care choice in an unordered manner. This result holds under the instrumental variable and random- effects models of multinomial probit models.

Surprisingly, under the multinomial probit model, the estimates of the SES index dummies now suggest all the socio-economic groups are more likely to choose spiritual/traditional institutions over government health facilities. In practical terms, this result suggests that if a representative agent is presented with the three health facility types, the agent would choose private and spiritual/traditional facilities ahead of government health facility. This result looks surprising, but it is plausible given the religious nature of the Nigerian society[4]. Thus, in this case, the agent views the output from a government health facility and a private health facility as the same end product, and therefore chooses to go spiritual if the private health facility fails to deliver the perceived care.

[4] Nigeria is a very religious society. 94% of the adult population in Nigeria view religion as very important in their lives (Pew Research, Global Attitude Project).

Probit Models				Multinomial Probit		
	Government	Private	Spiritual	Government	Private	Spiritual
Standard Probit Model				**Standard Multinomial Probit Model (MNP)**		
Poorest	Omitted /Reference Category			Omitted /Reference Category		
Poor	-0.708***	0.624***	0.581	0.960***		1.241***
	-0.183	-0.182	-0.419	-0.26		-0.591
Middle Class	-0.744***	0.635***	0.659	0. 995***		1.353***
	-0.187	-0.184	-0.414	-0.261		-0.59
Rich	-0.721***	0.726***	-0.121	1.032***		0.386
	-0.192	-0.191	-0.503	(0. 272)		-0.729
Richest	-0.865***	0.741***	0.695	1.167***		1.515***
	-0.2	-0.197	-0.426	-0.281		-0.618
Log (Medical cost)	0.118***	-0.121***	0.045	-0.173***		0.0482
	-0.0296	-0.0293	-0.0482	(0. 042)		-0.0759
Instrumental variable Approach				**Instrumental variable Approach (MNP)**		
Poorest	Omitted /Reference Category			Omitted /Reference Category		
Poor	-0.706***	0.624***	0.482	0. 944 ***		1.213***
	-0.186	-0.182	-0.416	(0. 254)		-0.56
Middle Class	-0.757***	0.635***	0.484	0. 980 ***		1.319***
	-0.205	-0.184	-0.447	-0.255		-0.062
Rich	-0.744***	0.726***	-0.291	1.028***		0.388
	-0.229	-0.191	-0.52	-0.266		-0.691
Richest	-0.919***	0.741***	0.427	1.147***		1.480***
	-0.254	-0.197	-0.523	-0.276		-0.588
Log (Medical cost)	0.18	-0.121***	0.302	-0.375***		0.123***
	-0.2	-0.0293	-0.302	-0.115		-0.177
Random Effects Model				**Random Effects Model (MNP)**		
Poorest	Omitted /Reference Category			Omitted /Reference Category		
Poor	-0.309**	0.273*	0.253	1.273***		1.975 ***
	-0.157	-0.155	-0.284	(0. 371)		(0. 970)
Middle Class	-0.351**	0.289*	0.347	1.291***		2.130***
	-0.15	-0.15	-0.292	(0. 369)		-1.001
Rich	-0.461***	0.407**	0.115	1.205***		0. 698
	-0.158	-0.158	-0.298	(0. 373)		-1.034
Richest	-0.698***	0.670***	0.113	1.469***		2.277***
	-0.176	-0.166	-0.322	(0. 401)		-1.023
Log (Medical cost)	0.146***	-0.150***	-0.0023	-0.208***		-0.084***
	-0.0239	-0.0236	-0.0432	-0.0588		-0.11
Observations	3,184	3,184	3,184	1,171		1,171

Table 6: Probit and Multinomial Probit Models

Standard errors in parentheses
***** p<0.01, ** p<0.05, * p<0.1**

The marginal effects of the multinomial probit model are presented in Table 7. On average, if an individual's economic status changes from the poorest to the richest group, the probability that the individual will choose a government health facility for treatment will decline by 0.218 or 21.80%. Thus, as individuals move up the socio-economic ladder, they are less likely to use public health facilities, and vice versa. Other marginal effects estimates can be interpreted in a similar manner. The results from the multinomial probit estimations are quite the opposite for private health facilities: wealthier individuals have higher probability of using private health facilities. The marginal effects of multinomial probit under the spiritual choice of health facility are mixed, and most of the estimates are not significant..

In terms of predicted probabilities (the second half of Table 7), individuals in the poorest group are predicted to go to government facility, private facility, and religious/spiritual institutions by probabilities of 51.9%, 45.7% and 2.42% respectively (sums up to approximately 1). Other estimates of predicted probabilities of the multinomial probit model can be interpreted in a similar manner. Individuals in the rich group (Q4) have the highest predicted probabilities of choosing a private health facility (68.2%). The probabilities that individuals from all socio-economic groups choose to go to a faith-based institution for medical service vary between 1.82%. to 5.51%. All the estimates are significant at the 5% conventional level.

Interestingly, Table 7 clearly shows that while most individuals in the upper socio-economic class are predicted to prefer private to public health facility by ratio of over 2:1, the converse is not true for individuals at the lowest bottom of the socio-economic index. For example, people in the poorest group are predicted to prefer

government to private facilities by only 6.2 percentage points (51.9% versus 45.7%), but in contrast, the richest individuals are predicted to go for private facilities relative to public facility by 36.4 percentage points (30.1% versus 66.5%).

	Marginal Effects of Multinomial Probit			Predicted Probabilities of multinomial Probit		
VARIABLES	Government	Private	Spiritual	Government	Private	Spiritual
Poorest	Omitted/Reference Category			0.519***	0.457***	0.0242**
				(0.0363)	(0.0362)	(0.0106)
Poor	-0.119**	0.101**	0.0176	0.400***	0.558***	0.0417***
	(0.0482)	(0.0484)	(0.0172)	(0.0340)	(0.0343)	(0.0141)
Middle Class	-0.190***	0.159***	0.0309*	0.329***	0.616***	0.0551***
	(0.0458)	(0.0465)	(0.0180)	(0.0291)	(0.0302)	(0.0148)
Rich	-0.220***	0.226***	-0.00593	0.299***	0.682***	0.0182**
	(0.0476)	(0.0479)	(0.0138)	(0.0285)	(0.0290)	(0.00836)
Richest	-0.218***	0.208***	0.0102	0.301***	0.665***	0.0343***
	(0.0502)	(0.0509)	(0.0178)	(0.0301)	(0.0313)	(0.0131)
Log (Medical)	0.0407***	-0.0438***	0.00307			
	(0.00998)	(0.0102)	(0.00400)			
Observations	1,171	1,171	1,171	1,171	1,171	1,171

Table 7: Marginal effects and Predicted Probabilities of Multinomial Probit Model

Standard errors in parentheses

***** *p*<0.01, ** *p*<0.05, * *p*<0.1**

3.3 Access to health care facilities and Facility bypass

While our regression estimates show that private facilities are the most preferred the community level data shows evidence of people bypassing cheaper and publicly provided care for relatively pricier private care. In this section we use community level data to examine the types of health care facilities available to the population. We go beyond mere presence of a facility to look at operational days, and distance from potential users. Clearly, the mere presence of a facility is of no use to the individual seeking care if such a facility is closed or is out of reach due to distance. At the community level, patent medicine vendors (PMVs) the most accessible: 78.13% of respondents say they are the most accessible in terms of distance, operational days, and mere physical presence. Primary health centers (PHCs), on the other hand, are open to 93.17% of the respondents every day of the week. Private clinics/hospitals are the farthest by distance but fare slightly better than government hospitals when it comes to the operational days in a week and availability. For instance, while 33.83% of respondents see private clinics/hospitals readily available in the community, only 24.32% view government hospitals the same way.

Table 8 below presents a summary of respondents' views on the availability of facilities, operational days and distance to the nearest facility for care.

	N	
Availability of facility (mean)		
PHC	28,447	58.41%
Govt. Hospital	27,226	24.32%
Private Clinic/Hospital	56,252	33.83%
PMV	26,631	78.13%
Opened on all 7 days of the week (%)		
PHC	12,952	93.17%
Govt. Hospital	5,358	96.50%
Private Clinic/Hospital	12,218	97.00%
PMV	12,504	100.00%
Distance to the nearest facility (Average Km)		
PHC	13,712	8.02
Govt. Hospital	18,407	15.45
Private Clinic/Hospital	36,659	19.98
PMV	18,370	3.01

Table 8: Community-Level Health Facilities Survey

4.0 Discussion of results

In this paper, we explored the issue of health care facility choice in Nigeria through descriptive and econometric analysis. One of the limitations of this paper is the lack of supply-side data which would have made the price of health care truly exogenous. However, we use instrumental variables probit and multinomial probit models to correct this estimation problem. A second limitation of this paper is that the demand for health care is treated as demand for homogenous goods due to lack of data on the nature of ailment affecting users. We correct for this shortcoming by creating dummies for intensities of care offered by each provider of health care. Furthermore, we also considered the

indicators of severe ill-health by looking at the ability of the individuals in the sample to do daily vigorous activities. These indicators minimize the bias that homogenous health care data may introduce into our results and estimation.

How do we compare patterns of health care demand among all income groups? We construct a socio-economic status index (SES Index) in which households are divided into quintiles based on their socio-economic scores. To ensure that our findings are robust, we consider the outcomes of health care choices of socio-economic groups under three different estimation strategies: descriptive analysis, probit model and multinomial probit model. While the probit model assumes that the socio-economic groups are faced with only one health care facility choice at a time, the multinomial probit model takes a more realistic approach in terms of modelling the socio-economic groups as choosing one health care facility from three different options.

Our findings show that the poor uses public health facilities more than the other socio-economic groups. This finding holds under probit and multinomial probit estimation strategies. The policy implication of this result is that the poor are likely to bear the brunt of any abrupt change in the structure of government sponsored health care in terms of increase in user fees and inefficient public health care delivery. We also find that social class does not seem to have much of an impact on the choice of private health facilities. This may suggest that private health delivery is better than public health care delivery, and users may be willing to pay the 'premium' for the perceived quality of care from the private health care sector. In addition, all socio-economic groups are less likely to seek medical care from a spiritual/religious establishment if only one health care choice is available. In contrast, when all the three health care facility choices are simultaneously made available to all income groups, all socio-economic groups will choose private, spiritual, and public health facility in that order of preference.

Primary health care centers are supposed to serve as the first point of access to health care by individuals. However, about 40% of all communities in Nigeria lack a primary health center and the average distance to a center is 8.02 Km. Given that PHCs are the best way of ensuring that medical care is provided by professionally trained it is important that local governments take steps to increase the number of facilities and quality of care while ensuring that cost is not hindrance to access. This along with the right set of regulations and enforcement should limit patent medicine vendors (PMVs) to their core role of selling over-the-counter drugs. PMVs currently enjoy high patronage among all socio-economic groups.

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Appendix

Variable Description	Urban			Rural		
	Mean	**Std. dev.**	**Factor Score**	**Mean**	**Std. dev.**	**Factor Score**
Computer	0.088	0.283	0.298	0.188	0.001	0.015
Television Set	0.645	0.478	-0.318	0.255	0.436	0.376
Bicycle	0.097	0.296	0.047	0.262	0.440	0.031
Radio	0.580	0.494	0.078	0.568	0.495	0.120
Refrigerator	0.289	0.454	0.298	0.084	0.278	0.306
Generator	0.329	0.470	-0.338	0.164	0.370	0.317
GSM Phone	0.884	0.320	0.183	0.631	0.483	0.240
Satellite Dish	0.096	0.295	0.310	0.030	0.169	0.228
Vehicle	0.133	0.339	0.339	0.043	0.203	0.217
House- Owned	0.478	0.500	0.046	0.822	0.383	-0.088
House -Rent	0.316	0.465	-0.010	0.043	0.204	0.089
Type of Floor						
Sand	0.024	0.153	-0.114	0.127	0.333	-0.132
Concrete	0.862	0.345	0.070	0.565	0.496	0.330
Wooden	0.010	0.099	0.007	0.010	0.102	-0.015
Tile	0.041	0.197	0.251	0.009	0.095	0.107
Mud	0.061	0.239	-0.145	0.286	0.452	-0.274
Source of Cooking						
Wood	0.208	0.406	-0.090	0.704	0.456	-0.192
Charcoal	0.024	0.152	0.007	0.006	0.078	0.064
Electric cooker	0.007	0.083	-0.001	0.003	0.052	0.034
Gas Cooker	0.030	0.171	0.217	0.006	0.078	0.057
Animal Ownership						
Goat	0.582	0.493	-0.049	0.702	0.458	0.095
Chicken	0.581	0.494	-0.049	0.702	0.457	0.095
Sheep	0.500	0.500	-0.049	0.579	0.494	0.095
Source of Water- Dry Season						
Pipe borne	0.166	0.372	-0.031	0.039	0.194	0.024
Borehole	0.415	0.493	0.086	0.340	0.474	0.205
River	0.025	0.155	-0.021	0.200	0.400	-0.148
Drainage	0.011	0.102	-0.044	0.010	0.098	0.016
Sachet Water	0.076	0.264	0.096	0.013	0.115	0.075
Sanitation Facility						
None	0.147	0.354	-0.042	0.282	0.450	-0.144
On Water	0.035	0.184	0.068	0.021	0.144	-0.005
Flush to Sewage	0.101	0.301	0.155	0.021	0.143	0.129
Flush to Septic Tank	0.248	0.432	0.245	0.050	0.218	0.200
Bucket/Pail	0.003	0.051	-0.012	0.008	0.088	-0.017
Uncovered Latrine	0.336	0.472	-0.095	0.341	0.474	0.134

Appendix A: Principal Component Analysis