SUPPLIER-INDUCED DEMAND AND HEALTHCARE IN LOKOJA

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ABSTRACT
This study investigates the existence of supplier-induced demand for healthcare in Nigeria's healthcare system where private healthcare provision and fee-for-service mode of payment are order of the day. Using primary data sourced from 379 respondents, the study estimates Linear Probability Model (LPM), to establish the relationship between supplier inducement and demand for healthcare. Findings from the study revealed that there is no statistically significant evidence to suggest the existence of supplier-induced demand for healthcare among the privately-owned hospitals in Lokoja. However, the study finds education and enrolment in health insurance to be negatively and statistically significantly correlated with supplier inducement. Having high education and enrolment in the health insurance scheme curtail the probability of receiving dubious care. Therefore, this research recommends, among others, that the government should make high education more accessible to the citizens by way of subsidizing tuition fees charged by universities, and providing soft education loans to eligible citizens. It recommends further that governments at all levels should provide health insurance for all.

Keywords: Supplier-induced-demand, Healthcare, Linear Probability Model, Lokoja

JEL Classification: I12; I14; I15

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1. Introduction

The relationship between doctors and patients tends to have asymmetric information pattern where doctors, more often than not, are more informed about their patients' health than the patients themselves. It is therefore not surprising that physicians, out of the desire to increase their income, advise their patients to consume more healthcare than they necessarily need. Due to the poor information from the part of the patients on the importance of health, and concern over the consequences of diseases, they simply comply with the order of the service providers without question. In health economic literature, this kind of excess demand or demand shifting of healthcare by doctors is known as supplier-induced demand (SID). SID simply refers to the idea that physicians/doctors, acting as agents for their clients, use their discretionary power to shift or induce demand such that their prescribed care differs from that which an informed patient would consider appropriate. The induced demand may be in the form of an increase in the number of services or a change in the mix of services provided to patients. It can as well relate to two broad areas of medical service – consultations and referrals (Bickerdyke, Dolamore, Monday, & Preston, 2002).

In the last few decades, SID has been of interest to researchers within the field of economics, and more specifically within the field of health economics (Mariné & Helen, 2016; Sorensen & Grytten, 1999). The question has been whether indeed doctors induce demand for their services across regions and institutions, to which there are mixed results. Some found a positive correlation (e.g. Birch, 1988; Sekimoto & Ii, 2015) while others found no SID in their regions (e.g. Carlsen & Grytten 1998). Demand inducement is an issue that economists believe has side effects and it affects interactions between a patient and

his physician. Transactions in economics generally involve two parties; a seller and a buyer. However, demand from patients (as buyers herein) in the health market is mediated by other factors (i.e. physicians and healthcare agencies) (Tunis, 2004).

Therefore, if SID exists in the health system it may lead to unbearable healthcare expenses for people and also it will hinder the doctors from meeting the ethical expectation placed on them by society. For instance, medical law requires medical treatment to be based on sound principles such as honesty, high-quality standard, humanity, efficiency, and non-discriminatory (Wulandari, Vita, Juliet & Muhammad, 2021). This is one of the reasons the healthcare induced demand hypothesis has been one of the most important subjects in health economics as well as healthcare management. For, caring for and selling unnecessary services to users of healthcare systems, which is accompanied by the exercising of power by the service providers brings about market failure (Mahmoudi, Roohi, & Al, 2018).

Literature shows that payment systems greatly influence doctors' attitude towards demand inducement. For instance, fee-for-service payment system is associated with over provision of medical care (Dzampe & Takahashi, 2021). This payment system reimburses health providers for the quantity of services provided irrespective of whether or not care is appropriate. Capitation system of paying providers, on the other hand, is where a fixed rate per capita payment is made to the provider irrespective of the number of services provided. Capitation by implication, therefore, provides doctors with the incentive to underprovide medical care to the patients (McGuire, 2000; Eggleston, 2005).

Public health facilities in Nigeria are mostly characterized by capitation system of payment. The remuneration of physicians

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in health public sector is based on monthly salary, while those that own private facilities get their pay in form of fee-for-service (Uchendu, Ilesanmi & Olumide, 2013). That is, the number of patients they treat determines what they get. This study, therefore, presupposes that those physicians in privately owned healthcare facilities will most likely induce demand unlike their counterparts in the public-owned facilities that have no incentive to induce demand for healthcare. This makes the private hospitals candidate for investigating the possibility of healthcare demand inducement. In Nigeria, low quality health services in the public facilities makes it almost necessary to patronize private healthcare facilities (Ogunbekun, Ogunbekun & Orobaton, 1999). In the Nigeria's private hospitals, unless one is insured (insurance coverage is mainly for public servants and some organized private organizations), the patients make out-of-pocket payment to healthcare, that is, the payment for services in the private sector is fee-for-service.

Considerable empirical works have been undertaken on SID, majorly originating from overseas. This study therefore attempts to bridge this gap and investigate this phenomenon in Nigeria because of the differences in health systems among countries and regions. There are also a range of institutional and financial settings among countries. Therefore, Nigeria's unique health system provides a right ground for investigation of this kind. Also, many of the studies in this field use data sourced from the providers. However, this study differs from them because it sources the data from individual consumers whose demand for healthcare is being induced. Again, very few studies have looked at this issue in Nigeria, out of which most of them are qualitative studies (e.g Vincent, Lewechi, Ashumate Paschal, Amade & Obiora, 2019) and that grossly undermine the power of their

conclusion. More so, this is the first study of its kind to be undertaken in Lokoja metropolis.

This study seeks to investigate whether SID exists in Nigeria's healthcare market especially among private health providers, using Lokoja as a case study. To achieve this goal, the following objectives are set out for the study, to examine whether there exists a relationship between privately-owned health facilities and SID in Lokoja, to analyze whether educational status reduces chances of supplier-induced demand for healthcare in Lokoja and to know whether Health Insurance curtails SID in Lokoja. The rest of the study is divided into five sections. Following the introduction, section one discusses presents an overview of the Nigeria's healthcare system. Section two reviews literature. The method employed is discussed in section three while results and discussion were presented in section four and lastly, conclusions and recommendations are presented in section five.

1.1 Overview of Nigeria's healthcare system

The healthcare delivery system in Nigeria is composed of both public and private healthcare providers. The provision of healthcare rests on the shoulders of the three tiers of government namely: The Federal, State, and Local Governments. The primary health care system is managed by the individual local government areas (LGAs) with support from their respective State Ministries of Health as well as private medical practitioners. The primary health care also has its sublevel at the villages and district with the provision of dispensaries in the hard-to-rich areas. The Secondary health care system, on the other hand, is managed by the Ministry of Health at the State level. Patients at this level are often referred from primary health care (PHC). At this level, the

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state government also works with voluntary and nongovernmental organizations, as well as private practitioners (Menizibeya, 2011). In Nigeria, tertiary healthcare offers consultative health care services, usually for inpatients and on referral from primary or secondary health professionals, in a facility that has facilities and personnel for advanced medical investigations and treatments, such as a tertiary referral hospital found in state capitals as Federal Medical Centres (FMCs). This level of care is exclusively provided by the Federal government.In the private sector, healthcare delivery is broadly provided at all levels of care including those that provide primary care (general practitioners), those that provide secondary care, and those that provide both primary and specialist care (Uchendu, Ilesanmi & Olumide, 2013).

2. LITERATURE REVIEW

2.1 Supplier-induced demand in theory

There are many theories explaining what causes demand inducement in healthcare. For our purpose, we are concerned about the following theories.

2.1.1 Target income hypothesis

A well-known theory for explaining physicians' behavior in inducing demand for healthcare is the target income hypothesis. The target income hypothesis posits that a physician is motivated to maintain a certain level of desired income (the target) and if their actual income falls below this level, they will then try to modify their behavior to restore their income up to the target (Folland, Goodman, & Stano, 2012). The main issue of concern in this theory is how physicians set their desired income. However, a physician's behavior change may include alterations

in the recommendations to patients as to the extent or appropriateness of diagnosis, and treatment modalities with the desire to produce additional income to meet a set target. Obstetricians, for instance, who recommend Caesarian sections as typical care for delivering babies could be using their influence over pregnant women and their partners as a revenue-generating procedure to reach or at least maintain their target income (Folland, Goodman, & Stano, 2012).Some proposed healthcare models could modify how a physician is reimbursed for delivering care that would reward quality over quantity thereby reducing SID. Some of these models propose reimbursing physicians through a gainsharing model that encourages them to collaborate with other health service providers to deliver care thereby removing some of the individual incentives to induce demand (Shafrin, 2010). Pay for performance (P4P) may also provide a strategy to discourage the overuse of unnecessary and low-value care by reimbursing for the quality of care delivered (Enthoven, 2009).

2.1.2 Professional uncertainty hypothesis

This hypothesis suggests that due to the liberty and individual practice patterns of physicians, they tend to differ in their opinions regarding the efficiency, success rates, and appropriateness of various treatment options for a particular condition or ailment. This leads to a level of uncertainty which may result in a lack of uniformly acceptable standards of treatment that can be followed by all physicians. This uncertainty could lead to different levels of recommended healthcare services consumption (demand) to patients (Wennberg, Barnes, & Zubkoff, 1982). This issue, however, may be reduced by the use of evidence-based guidelines based on scientific evidence of improved outcomes for the diagnosis and treatment of a particular

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condition thereby reducing all professional uncertainties encountered by the physicians (Reinertsen, 2003).

2.2 Empirical Review

The healthcare market is so complex and there is a range of opinions about what constitutes inducement. Moreover, the SID hypothesis relates to an effect on demand that is, in most cases, cannot be measured directly. This has forced researchers in health economics to explore SID indirectly and, in doing so, develop a variety of theoretical models and tests that empirically display varying degrees of sophistication and support for the hypothesis (Bickerdyke, Dolamore, Monday, & Preston, 2002). In this section, we try to highlight some studies carried out on SID. The empirical evidence is categorized into those that measure the effect of doctor-population ratio on the number of services provided; those that measure the effect of doctor supply on doctor-initiated visits; those that measure the treatment patterns after changes in remuneration structures, and those that use inter-regional variations in utilization to investigate the existence of SID.

2.2.1 Doctor-patient population ratio

This is the most commonly found approach of measuring SID in the literature (e.g Fuchs, 1978; Birch, 1988; Stano et al., 1985; Cromwell & Mitchell, 1986; Sekimoto & Ii, 2015). In this case researchers use the ratio of doctor-to-population to determine inducement. According to this approach, a positive doctor-to-population ratio and the utilization of healthcare means supplier-inducement. Using this measurement, Delattre and Dormont (2003) carried out in France showed that an increase in the number of physicians relative to the population reduces the number of patients seeking medical advice or counseling.

However, this reduction was minimal and a decline in the number of consulting physicians did not increase the volume of medical services required.

The main drawbacks of this approach is that interpretations of results can be really difficult. Again, correlations do not suggest causality. Also, the positive correlation may indicate a normal reaction from the physician market reacting to an increase in patient demand due to an increase in access or improvement in treatments (Bickerdyke, Dolamore, Monday, & Preston, 2002). The ratio only indicates the effects of physician supply, but the real concern in SID is the price of medical care and the income of physicians (Rice & Labelle, 1989). This means that, even when the ratio of physphysician to population does not vary, inducement in demand can occur.

2.2.2 Doctor-initiated visits

This approach to SID measurement simply makes use of survey data. For instance, Wilensky and Rossiter (1981) used the National Medical Care Expenditure Survey (NMCES) in the United States and found that 40% of visits to doctors in 1977 are doctor-initiated. Additionally, they find only a small, though, statistically significant positive correlation between the doctor-initiated visits and physician-population ratio. In the same vein, the study also shows that the probability of doctor-initiated visits increases with a decrease in patient out-of-pocket expenditure. One probable explanation is that when patients feel less financially burdened from the cost of care, they are inclined to not question the physician on the quantity of care utilized. In this scenario, SID can occur more easily. Similarly, in Ireland, Tussing and Wojtowycz (1986) showed a strong positive

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statistically significant correlation between the physician-population ratio and the proportion of doctor-initiated return visits. The correlation between the physician-population ratio and doctor-initiated visits also run into criticism. One of them is that the health status variable always shows a stronger correlation with physician-initiated visits compared with the physician-population ratio variable in these studies (Rice & Labelle, 1989). In fact, most studies on healthcare utilization show that health status is the most important determinant of demand.

2.2.3 Changes in remuneration structures

Other studies investigate demand inducement by looking at the direct effect of changing the price on service usage. Following the SID theory, these studies test the hypothesis that when doctors' reimbursements decrease, they naturally prescribe more. Using this index, Aktan & Isik (2016) found that the government's financial support has resulted in demand inducement. The study shows, during the time, total expenditures increase as fast as before the fee controls and physicians not only increased utilization of services but also increase utilization of more complex services. The main concern with cost control is controlling for overall expenditure. If SID exists, then price controls will be rendered useless because physicians can still swell their income by increasing utilization. In a similar fashion, Wolsko, Eisenberg, and Davis (2002) showed that a percentage reduction in medical costs by the service providers could increase induced demand for services by up to 7.5%.

2.2.4 Inter-regional variations in utilization/ geographic factors

Canser, Haydar, & Selma (2015) examined the factors that influence the demand for health services and the relationship

between them and demographic characteristics. Systematic sampling was used to select the sample in this study. Data on factors affecting the health services demand were collected in five categories: economic factors, attitudes and behaviors of the physician, attitudes, and behavior of nurses and auxiliary staff, characteristics of the health institute, and the physical environmental specifications of the health institute. According to this study, gender, family members, personal income, and perception of economic level affect the demand for health services. In addition, a clean environment and quality of healthcare services, medical equipment for diagnosis and treatment in health care facilities, adequate laboratory, and analysis unit, the information provided about diagnosis and treatment by doctors, and the reliability of healthcare services provided by doctors emerged as the factors most affecting health demand.

Also, Richardson and Peacock (1999) found significant differences in utilization rates as predicted by sex and sage compared with the observed utilization rates. They found that total hip replacement exceeded its predicted variation by 110% and colonoscopy by 2000%. Toshiki et al (2016) used data of Fukuoka Late Elders' health insurance in Japan from 2010 – 2013 to investigate the supplier-induced demand in the use of Gastrectomy among older adults. Using Multilevel logistic analyses to investigate the existence of SID, the study found, after controlling for patient factors, significant regional level variance in gastrectomy use. And also hospital density was found to be significantly positively correlated with gastrostomy. The study suggested that the small area variation in use of gastrostomy among older adults could be explained by hospital physician density, which might indicate the existence of SID.

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The studies of variation have been under criticism, also, due to its inability to control for all possible explanatory factors affecting demand for health (e.g. health status, insurance coverage, physician characteristics, patient characteristics, etc.). In addition, differences in the provision of care controlling for patient characteristics do not mean physicians are controlling demand since many a time there is no appropriate benchmark of care. The corpus of literature reviewed above shows that payment systems influences the behavior of doctors. Therefore, using Nigeria's healthcare payment system make our study different. The studies also were carried out on the systems of healthcare different from Nigeria's. Another measure strength of our study is that it tries to address the shortcomings found in the literature by using self-assessed data from consumers of healthcare and also controlling for chronic diseases that may invariable affect the visit to the health facility.

3. Method

3.1 Questionnaire Content

The questionnaire was generally divided into two sections. Section A elicits pieces of information about the respondents' socio-demographic characteristics. Whereas section B presents the list of some close-ended questions with the answers mainly binary-response anchors of 'yes' and 'no' to choose from, and open-ended questions that requires the respondents to provide answers by themselves. All questions included are found in the literature of supplier-induced demand and they are believed to be factors that may influence one's return visit to the hospital.

3.2 Sampling and questionnaire administration

This study uses simple random sampling technique in choosing respondents. Given the 2021 estimated population of Lokoja as 741,482 (World Population Review, 2021), we use a sample size table created by Krejcie & Morgan (1970) to determine the sample size which is given as 384. Collection of data was done via face-to-face administration of structured questionnaires, to random people mostly in the hospitals. The questionnaires were administered by ten interviewers that were adequately trained for the exercise. The questionnaire was done on a single page and was presented along with a cover letter explaining the purpose of the research to the respondents. Finally, 385 questionnaires were administered to respondents mostly in the hospitals (about 66%) while some were administered in the houses and offices (about 34%) of the respondents that were willing to be sampled. This is to achieve as much variation as possible.

We achieved a more than 98% response rate from the questionnaires distributed. This was expected since a face-face-face interview was used. Again, interviewers were instructed to remind respondents where information is missing since the questionnaire was so brief. However, six questionnaires were excluded from the analysis because of incomplete responses. As such, only 379 questionnaires were used for the analysis.

3.3 Data and Variables

The dependent variable was constructed using a question that directly measures doctors' stimulated visits. The question asked respondents whether subsequent return visit was arranged which is coded 1 if yes, and 0 otherwise. This variable is adopted from Tussing and Wojtowycs (1986). The independent variable

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is also a binary variable where respondents were asked to state whether they go to a private or public hospital. It is then recorded as 1 if the respondent reports that they visit a private hospital and 0 if they go to a public hospital. We controlled for other variables including demographic variables such as age, gender, marital status, income, educational qualification, and occupation. Other covariates include binary indicators of whether the respondent is covered by health insurance, whether they have any chronic ailment, and a continuous variable that indicates the hospital charges. All these variables are found to have a relationship with doctors' stimulated visits in the supplier-induced demand literature and therefore their inclusion in the analysis is justified.

3.4 Empirical Model Specification

To explore the relationship between doctor-initiated visits and attending private hospitals we modeled doctor's-initiated visits as a function of attending private hospital and other individual characteristics. Given the nature of the dependent variable, which is binary that takes 1 if respondent's last visit to the hospital was initiated by the doctor and 0 otherwise, we estimated the relationship as Linear Probability Model (LPM) using Ordinary Least Square (OLS). Thus, the following equation is estimated.

$$Pr(drinvisit_i = 1|prihosp_i) = \beta_0 + \beta_1 prihosp_i + \beta_2 education_i + \beta_3 insurance$$

Where *drinvisit* represents doctor's initiated visit, subscript *i* represents individual, β_0 is the slope of the regression, *prihosp* is the variable that represents whether respondent visits a private

hospital or not, *education* is educational status variable which ranges from no formal education to tertiary education, while *insurance* represents whether the respondent is insured or not, ***x*** is the vector of other individual characteristics relevant to this study while *u* is the stochastic error which is assumed to be individually and identically distributed with 0 mean and σ^2variance. The parameters to be estimated are $\beta_0, \beta_1, \beta_2, \beta_3 and\ \beta_4$.

All the estimations and descriptions of the variables are done with STATA statistical package version 12.

4. Results and discussion

4.1 Demographic Characteristics of respondents

The demographic characteristics of respondents are reported in Table 4.1 Their gender distribution is female (n=196) dominated in a proportion of about 52% while the male (n=183) constitutes 48% of the respondents. The literacy profile of the respondents shows that about 92% are literate with the highest being first degree with about 36% respondents. On the other hand, only about 8% have informal education. Meanwhile, the participants' occupational distribution reveals that the majority of them (46%) are Government workers, followed by 33% that are unemployed, while the proportion of self-employed among the respondents stands at 21%.

Slightly more than half of the respondents (about 51%) reported that they are single 49% of them are married. Findings on income showthat there is great income disparity. Most of the participants (46%) are earning just between 0 to ₦30,000 and only two people of the 379 respondents earn between ₦60,000 and ₦90,000 and ₦90,000 and above respectively. The age of the

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respondents shows that more than 76% are between the age of 18 and 40 while only 24% are between the age of 41 and above.

Table 4.1 Respondents Summary Statistics

Variable	Proportion/Observation	Percentage
Age		
18 – 30 years	199	52.51
31 – 40 years	89	23.48
41 – 50 years	63	16.62
51 and above	28	7.39
Gender		
Male	183	48.28
Female	196	51.72
Educational Qualification		
Non-formal	29	7.54
Primary	27	7.12
Secondary/GCE/H	66	17.4
SC	136	35.88
NCE/OND/HD	95	25.07
B.Sc.	26	6.86
M.Sc. and above		
Marital Status		
Married	186	49.08
Single	193	50.92
Income		
0 – N30,000	174	45.91
N30,001 –	109	28.76
N60,000	53	13.98
₦60,001- ₦90,000	41	10.82
₦90,001 and above		
Occupation		

Unemployed	124	32.72
Government	175	46.17
employed	80	21.11
Self-employed		

Source: authors' computation (2022).

Table 4.1.1 gives further information about the proportion of respondents regarding the type of hospital subscription. As shown in the table, 110 (56%) of the total respondents (195) that attend private hospitals reported that their last hospital visit was initiated by their doctors as against 44% that reported that they went to the hospital without any prompting by their doctor. On the other hand, of the 184 respondents that go to Public Hospital 96 (representing 52%) reported that their doctor initiated their last hospital visit while 48% did their last hospital visit on their own.

Table 4.1.1 Descriptive Statistics of Doctor's initiated visit by private hospital customers

		Attend private Hospital		**Total**
		Yes	No	
Doctor' s initiated last visit	Yes	110 (56%)	96 (52%)	203
	No	85 (44%)	88 (48%)	173
	Total	195 (100%)	184 (100%)	379

Source: authors' computation (2022).

To see the above information more clearly, we represented it in a bar-chart (see figure 4.1.):-

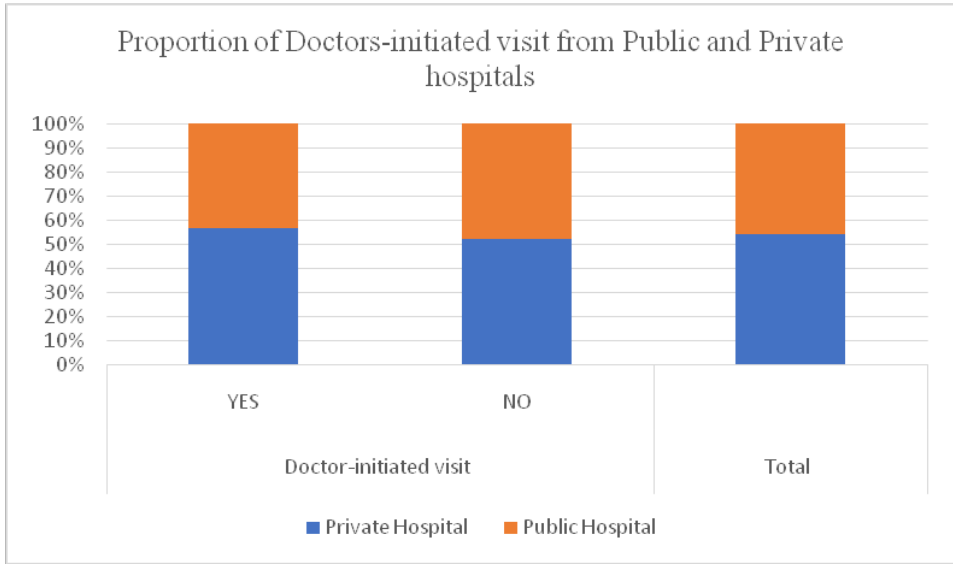


Figure 4.1.1: Bar chart showing the proportion of doctor-initiated visits in the data.

4.2 Result presentation of the estimated model

The following result in Table 4.2 is obtained by estimating Linear Probability Model (LPM) used to determine the relationship between the dependent variable and independent variables.

Table 4.2Linear Probability Model regression result with *dr_in_visit* as dependent variable

Variables	Coefficient	t-values	p-values
Priv_hosp	0.056	0.98	0.327
	(0.057)		
Male	-0.017***	-3.91	0.001
	(0.523)		
Age	0.040***	3.86	0.001
	(2.26)		
Education	-0.079***	-4.803	0.000
	(0.0014)		
Government	-0.0089**	-3.67	0.013
employee	(0.002)		
Self-employed	0.069***	4.01	0.000
	(0.085)		
Married	0.153**	2.34	0.020
	(0.065		
l_income	-0.098***	-4.26	0.000
	(0.0015)		
Insurance	-0.038***	2.79	0.001
	(0.00016)		
Chronic ailment	0.122**	3.11	0.015
	(0.0045)		
ln_hosp_fee	0.054**	2.88	0.045
	(2.196)		
Constant	0.220***	4.52	0.001
	(0.0065)		
Observation	379		
R-squared	0.074		
Observation	379		

Note: ***=significant at 1%, **=significant at 5%. Standard Error in parenthesis.

From the result, it shows that, although positive, there is no statistically significant relationship between the dependent

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variable which is the doctor's-initiated visit and the main variable of interest (*priv_hosp)* which is an indicator of whether a person attends a private hospital or not. The result suggests that there is no supplier-induced demand for health care in Lokoja. This result is not at all surprising as it agrees with the findings of many researchers (e.g Mitchell & Scott, 1992; Carlson & Grytten 1998; Sørensen & Grytten 1999).

A further look at the table reveals that all other covariates showed a significant relationship to the dependent variable; males are 1.7% less likely to visit hospitals due to doctor's-initiated visits as against their female counterparts. On the other hand, the elderly are more likely to be prompted to visit hospital by their doctors as shown by the coefficient of variable *age* which shows that the likelihood increases by 4% as age increases. The variable education, which is an indicator of the highest level of education one has, shows that the higher the qualification obtained by the participant the lower the probability that their doctors commit them into visiting hospitals. This may not be unconnected with the fact that doctors would expect that those with higher education would easily understand whether they actually need such care prescribed or not. Looking at the employment category variables also shows that government employees are also less likely to be coerced into visiting hospitals. This is very true looking at the fact that most of the government employees reported that they are enrolled in the Health Insurance Scheme. However, the result shows that self-employed are 6.9% more likely to visit hospitals due to doctor's recommendation than their unemployed reference category.

Those who are married are 15% more likely to be prompted to visit hospital for care by their doctor than their single category. Surprisingly, the result shows that those in the high-

income category are 9.8% less likely to visit hospital following their doctor's initiation than those the in low-income category. Insurance played a very good role in stopping doctors from initiating a follow-up visit from the patient as exhibited by the negative sign of the variable *insurance* in the model. Respondents that reported that they have one chronic ailment or the other are also more likely to visit the hospital due to the doctor's recommendation than those who do not have any chronic ailment. Also, the continuous variable *ln_hospital_fee* shows that there is a statistically significant relationship between doctor's-initiated visits and hospital charges. That is the more the hospital charges the more the doctor initiates follow-up visits. Although the R-squared shows that only 7.4% of the variation is fitted by the model, this is very common with cross-sectional data. (Wooldridge, 2002).

5. Conclusion and Recommendations

Looking at the Nigeria's healthcare system, this study aimed at finding if there exists supplier-induced demand for healthcare from the private hospitals in Nigeria using data sourced from healthcare consumers in Lokoja metropolis of Kogi State, Nigeria. Theories suggested that SID occurs for pecuniary reasons. Therefore, the presence of supplier-induced demand was suspected a-priori because large chunk of Nigeria's population subscribes to private healthcare providers. They are also not under the coverage of any health insurance and thereby make a lot of out-of-pocket payment to private healthcare providers whose mode of payment is mostly fee-for-service. Also, doctors face no stringent condition in setting up private healthcare facilities. This make the system a fertile ground for demand inducement. After controlling for all covariates that are believed to cause SID, the result of our study shows that there is no

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statistically significant evidence to suggest the existence of supplier-induced demand for healthcare in Lokoja metropolis. Although this result is contrary to our expectations, it, however, coincides with the findings of other some researchers (Mitchell & Scott, 1992; Carlson & Grytten 1998; Sørensen & Grytten 1999). The study confirms that level of education greatly determines the stimulation of demand for healthcare. It shows that healthcare demand inducement reduces with the increase in the level of education. On the other hand, the result of the analysis also confirms that health insurance greatly reduces the chances of healthcare demand stimulation by doctors.

This study happens to be the first of its kind to be conducted in Lokoja area of Nigeria. No study, to the best of our knowledge, has ever been conducted in Lokoja to unearth SID from the existing private hospital. Such a research vacuum could explain why there is no mechanism in place for supply-side cost-sharing. The study, therefore, tries to fill this vacuum by exploring the demand inducement hypothesis from the angle of consumers of healthcare. By that, only data sourced from the consumers were used to carry out the analysis of this study. This procedure is very much in line with the approach of other existing literature in the SID hypothesis. Although there is no evidence that SID exists in the private hospitals of Lokoja, the study confirms the relationship of this phenomenon with other important characteristics. This research, therefore, provides an important starting point to researchers in this part of the world to gain more information and understanding of the SID hypothesis.

Given the result of the analysis of this research, it behooves this research to make some policy recommendations as follows: -

From the result, it is uncovered that those who have a high level of education are less likely to be swindled into unnecessarily visiting hospitals. For this lone reason, we recommend that government should make high education more accessible to especially poor citizens by way of reducing the school charges charged by universities and or providing soft education loans to eligible citizens.

It is also expedient for governments at all levels to step up their effort in providing healthcare insurance coverage for all. If possible, government should have a target to provide insurance cover to all and sundry in the next few years to come. This will help curtail out-of-pocket spending on healthcare by the citizens as well as further ensure that no 'uninformed' patient is given more healthcare than their actual need. Governments and other organizations (such as the World Bank) bankrolling surveys in Nigeria should make more concerted efforts in providing reliable data that follow individuals across time so as to aid this kind of research. This will undoubtedly provide other researchers opportunity to look more into this area holistically. The reason is that the data for this study is collected for a single period and therefore there are limitations to the methods that can be applied to it for analysis. This also will give researchers the opportunity to get larger samples.

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