RESILIENCE AND LIVABLE CITIES IN A WARMING WORLD

A FESTSCHRIFT IN HONOUR OF

TPL. DR. JOSHUA ADEWUMI ADEBISI FNITP, RTP



EDITED BY

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Editors:
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ISBN: 978-978- 63753-0-4

Published By:

The Nigerian Institute of Town Planners,
Oyo State Chapter,
Quarter 704, Iyaganku GRA, Ibadan.

Supported By:

Center for Sustainable Urban Planning,
Logistics, Infrastructure and Future Transport
3B, Upper Ijesha Road, Taiwo Estate, Iponri, Lagos.

Printed By:
DCrowns Multiventures,
P. O. Box 27796, Ibadan.
oludarebiyi@gmail.com | +234-8053896026

TABLE OF CONTENTS

Foreword..... vii

The Profile of TPl. Dr. Joshua Adewumi Adebisi viii

Scholarly Perspectives to Celebrate Tpl. Dr. Joshua A. Adebisi in Grace and Honour..... x

Table of Contents xvii

Preface..... xx

Contributors Profile.....xxii

SECTION ONE: CLIMATE CHANGE AND URBAN PLANNING

1. Climate-Resilient Housing and Informal Settlements in Lagos State: Pathways Toward Adaptive Urban Governance and Sustainable Development
- ALABI Oluwole Titilayo **2**

SECTION TWO: ENVIRONMENTAL JUSTICE, SAFETY AND SUSTAINABILITY

2. Environmental Safety Risks of Traffic-Related Carbon Monoxide Emissions in Uyo Metropolis, Akwa Ibom State, Nigeria - AKPAN Patrick Etim **15**

3. Integrating Sustainable Strategies in The Design of Convention Centers in Lagos, Nigeria
- OLADELE Victor Olayinka & ADEDEJI Afolabi Idowu **34**

SECTION THREE: GREEN INFRASTRUCTURE AND ECOSYSTEM-BASED APPROACHES

4. Appraisal of The Effectiveness of Green Infrastructure and Ecosystem-Based Approaches in Enhancing Urban Resilience in Sub-Saharan African Cities
- AKINADE Adekunle Joshua **50**

SECTION FOUR: URBAN AGRICULTURE AND FOOD SECURITY

5. Fear of Crime and Food Security Dynamics in Oke-Ogun Rural-Urban Border Communities of Oyo State: Implications for Livelihoods and Spatial Resilience
- OGUNDIRAN Olayinka Robert **67**

6. Assessing the Spatial Patterns of Urban Agriculture in Ibadan, Nigeria: Integrating Satellite Imagery into Land Use Planning Strategies for Enhanced Food Security
- OLADIRAN Ibironke Olaide **82**

7. Urban Agriculture and Social Justice: Comparative Analysis of Inclusive Planning Policies in Lagos And Ibadan, Nigeria - OYEJIDE Olarinola I., ADEBOWALE-SALAWU Temiloluwa E. & OYEJIDE Oyedeji T. **98**

SECTION FIVE: DIGITAL INNOVATION AND SMART URBAN ADAPTATION

8. Smart Solutions for Resilient Transportation Infrastructure and City Livability: Examples from The State of Connecticut, United States of America - OLALEYE Eyitayo, OLUWOYE Jacob & OGUNKAN David **114**

9. AI-Driven Portfolio Management for Ibadan Wash Infrastructure: A Strategic Framework for Sustainable Planning in Ibadan Metropolis - ODUNFA Victoria O., ELEGBEDE Olufola. T., TAIWO Olushola S. & OGUNDIRAN A. A. **137**

10. Synergizing Global System of Mobile Communications and Artificial Intelligence for Inclusive Regional Development in Nigeria - ADEBISI Joshua Adewumi **157**

SECTION SIX: INCLUSIVE AND PARTICIPATORY URBAN GOVERNANCE

11. Promoting Community Inclusiveness in Public Recreational Facilities Through Design-Based Strategies in Nigerian Cities - OGUNDARE Abiodun Olusogo, ADEDEJI Afolabi Idowu & OLADELE Victor Olayinka **162**

SECTION SEVEN: HEALTH, WATER, SANITATION AND URBAN WASTE

12. Socio-Economic Determinants and Utilization Patterns of Primary Health Care (PHC) Facilities in Ibadan Metropolis, Nigeria - ADEJARE Jacob Ayorinde **173**

13. Water Quality Evaluation and Sanitary Surveying in Southwest Nigeria - LASISI Kamil Oluranti **190**

14. Econometric Analysis of Health Care Accessibility and Health Care Outcome in Semi-Urban Area: Evidence from Alakia Primary Health Care Centre, Ibadan, Oyo State - KOLAPO Oluyemi Mary & OMEOKWE Favour Chibueze **206**

15. Assessment of Private Sector Participation in Solid Waste Management in Ojokoro Community, Lagos Stat - IYANDA Oladimeji **223**

SECTION EIGHT: PUBLIC SPACE, HOUSING AND LAND USE PLANNING

16. Urban Redevelopment and The Reconfiguration of Public Space in Ibadan, Nigeria AKANMU Ayobami Ademola, SALISU Umar Obafemi, FASINA Simeon Oluwagbenga, & SANNI Sekinat Motunrayo **243**

17. Incremental Housing and Physical Planning Standards' Compliance in Ibadan Sub-Urban Areas, Oyo State, Nigeria - LASISI Kamil Oluranti **258**

18. An Overview of Adoption of Government Regulations on Building Projects in The Oke-Ogun Area of Oyo State, Nigeria - AJAO Ayodele Christianah, AREMU John Adekunle & TIJANI Kabiru Okegere **277**

SECTION NINE: RISK REDUCTION AND DISASTER-RESILIENT CITIES

19. Integrated Flood Risk Management and Urban Livability in Nigeria's Coastal Cities: Insights from Ibeju-Lekki Corrido - OGUNSESAN Abimbola Simiat & BOLUKALE Oluwatoyin **287**

20. Mitigating Urban Flood Risks: Lessons from Ibadan For A Disaster-Resilient City - AYORINDE Adedayo & BOLUKALE Oluwatoyin **306**

21. Integrating Climate Resilient Design Principles into Sustainable Residential Development in Ibadan, Nigeria - ABAIRE Oluwatobiloba, ORKPE Arwashima Kristen & OLADELE Victor Olayinka **326**

SECTION TEN: URBAN MOBILITY AND LOW CARBON TRANSPORT

22. Decarbonizing Urban Mobility in Nigeria: Opportunities and Constraints for Transitioning to Electric Public Transport Systems - ADEBOWALE-SALAWU Temiloluwa E. and OYEJIDE Olarinola I. **340**
23. Road Transport System in Nigeria: Key Issues and Challenges - ADEYINKA Ebenezer Olasupo & ALABI Folami Munta & ANIMASHAUN Idris Olalekan **349**
24. Urban Road Traffic Resilience and Sustainable Development in Ibadan, Nigeria - OGUNSESAN Durodola Kamoru & OGUNSESAN Abimbola Simiat **360**
25. Residents' Appraisal of Urban Mobility and Low Carbon Transport Solutions in Ibadan, Oyo State - TEJUOSHO Itunu Elizabeth, OLORUNFEMI Samuel Oluwaseyi & ADENIRAN Adetayo O. **376**
26. Road Infrastructure Vulnerability and Urban Mobility Safety Risks in Southwestern Nigerian Cities - SALISU Umar Obafemi, NALAILA Stephano & Akanmu Ayobami Ademola **391**

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C-SUPLIFT

ISBN: 978-978- 63753-0-4

CHAPTER
14

ECONOMETRIC ANALYSIS OF HEALTH CARE ACCESSIBILITY AND HEALTH CARE OUTCOME IN SEMI-URBAN AREA: EVIDENCE FROM ALAKIA PRIMARY HEALTH CARE CENTRE, IBADAN, OYO STATE

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Abstract
This study examined the relationship between healthcare accessibility and healthcare outcomes in a semi-urban area with focus on Alakia Primary Healthcare Centre, Ibadan, Oyo State. Specifically, the study investigated the effects of healthcare accessibility, healthcare affordability, and availability of healthcare personnel on healthcare outcomes among patients attending the health centre A cross sectional research design was adopted for the study. The population comprised of healthcare users in Alakia Primary Healthcare Centre, while a sample size of three hundred and eighty-five (385) respondents was selected using the purposive sampling technique. Data were collected through a structured questionnaire and analysed using descriptive statistics and simple regression analysis with the aid of Statistical Package for Social Sciences (SPSS). The findings revealed that healthcare accessibility had no statistically significant effect on healthcare outcomes ($p= 0.190 > 0.05$, $R^2= 0.015$). Similarly, healthcare affordability had no statistically significant positive effect on healthcare outcomes ($p= 0.352 > 0.05$, $R^2=0.007$). However, the availability of healthcare personnel had a significant positive effect on healthcare outcomes ($p= 0.000 < 0.05$, $R^2 =0.108$), Indicating that 10.8% of the variation in healthcare outcomes was explained by the availability of healthcare personnel. The study concluded that while healthcare accessibility and affordability did not significantly influence healthcare outcomes in the study area, the availability of healthcare personnel significantly improved healthcare outcomes among patients attending Alakia PHC. The study therefore, recommends that government and healthcare administrators should prioritize the recruitment, training, and retention of qualified healthcare personnel, improve healthcare service delivery, and provide adequate funding for primary healthcare facilities in semi-urban communities.

Keywords: Healthcare Accessibility, Healthcare outcome, Healthcare affordability, healthcare personnel, Primary Health Care Centre.

1.0 Introduction

World Health Organization, WHO, (2020) states that Access to quality healthcare is a fundamental determinant of human well-being and economic development. In developing countries such as Nigeria, healthcare accessibility remains a major concern particularly in semi-urban areas where infrastructure and service delivery are often inadequate. Semi-urban areas typically exhibit characteristics of both urban and rural environments, resulting in uneven distribution of healthcare resources

and services. According to World Health Organisation, WHO (2024), healthcare outcomes, on the other hand, refers to the effects of healthcare interventions on the health status of individuals and populations. Common indicators of healthcare outcomes include mortality rates, morbidity rates, recovery rates, patient satisfaction, and life expectancy. Positive healthcare outcomes are often associated with effective healthcare systems that ensure adequate access to healthcare services. Conversely, poor healthcare accessibility may result to in delayed diagnosis, inadequate treatment, and increased prevalence of preventable diseases.

National Bureau of Statistics, (2024) in observes that in many semi-urban communities, poor access to healthcare services leads to delayed diagnosis, inadequate treatment, and increased prevalence of preventable diseases. Factors such as low income, poor transportation systems, and inadequate health infrastructure further contribute to these challenges. Studies have shown that disparities in healthcare access significantly affect health outcomes, particularly in low and middle-income countries. Also, Wooldridge [2012] states that statistical analysis provides a systematic and quantitative approach to examining the relationship between healthcare outcomes. By applying statistical models, it becomes possible to estimate the impact of variables such as distance, cost, and availability of healthcare services of health outcomes. This study therefore focuses on Alakia Primary Healthcare Centre to provide empirical evidence on this relationship in a semi-urban setting.

Despite various healthcare reforms and investments, access to healthcare services in semi-urban areas remain inadequate and unevenly distributed. Many residents still face challenges such as long distances to health facilities, high-cost treatment, shortage of healthcare professional, and poor infrastructure. These barriers often result in reduced utilization of healthcare services and poor health outcomes. Also, despite general challenges in healthcare accessibility across semi-urban areas, the situation is particularly evident in facilities such as in adequate medical personnel, insufficient medical equipment, long waiting times, and financial constraints among patients. These limitations can lead to delayed treatment, reduced utilization of healthcare services, and proper health outcomes among residents in the area. Reports on primary healthcare delivery in Nigeria indicate that such facility-level constraints significantly affect service efficiency and patient outcomes, purposefully, this study aim to examine the relationship between healthcare accessibility and healthcare outcomes in semi-urban areas using econometric techniques; with the objectives to; access the level of healthcare accessibility in semi-urban areas, examine the key factors affecting access to healthcare services, analyse the impact of healthcare accessibility on healthcare outcomes, and determine the extent to which accessibility variables influence health indicators such as morbidity and mortality rates. Also, the hypotheses that guide the study are:

i. H_1: Healthcare accessibility has a significant effect on healthcare outcomes in the study area.
ii. H_2: Cost of healthcare services significantly affects access to healthcare.
iii. H_3: Availability of healthcare personnel significantly influences healthcare outcomes.

2.0 Literature Review

2.1 Conceptual Underpinning

2.1.1 Healthcare Accessibility

World Health Organisation, WHO, (2020), Postulates that healthcare accessibility should ensure that all individuals receive timely and appropriate healthcare services without suffering financial hardship. In practical terms, accessibility involves not only the physical presence of healthcare facilities but also the ability of individuals to reach, afford and utilize those services.

According to World Bank (2024), healthcare accessibility encompasses the extent to which healthcare services are geographically, reachable, financially affordable, and socially acceptable to individuals and communities. Poor accessibility contributes to delayed treatment, increased disease burden, and poorer health outcomes. In Nigeria, healthcare accessibility remains a significant challenge despite forms in the healthcare sector. The Federal Ministry of Health and Social Welfare (2024), reported disparities in healthcare across urban, rural, and semi-urban communities.

2.1.2 Healthcare Outcomes

Healthcare outcomes refers to the measurable changes in an individuals' health status resulting from healthcare interventions. According to WHO, (2020), Healthcare outcomes are indicators of effectiveness, quality, and efficiency of healthcare systems and are critical for monitoring progress toward universal health coverage and sustainable development goals. They include; recovery rate, morbidity rate, mortality rate, and patient satisfaction. According to the Organisation for Economic Cooperation and Development (2024), Improved healthcare accessibility significantly contributes to better healthcare outcomes through increased utilization of preventive and curative services. Healthcare outcomes are influenced by both individual and systematic factors. Individual factors include health behaviour, life style, and socio-economic status, while systematic factors include the availability of quality healthcare services.

Healthcare accessibility influenced by a wide range of factors, particularly in semi-urban settings. One of the most important determinants is the distance to healthcare facilities. According to WHO (2025), it is stated that improved access to healthcare services leads to earlier diagnosis, timely treatment, and better health outcomes. Another critical determinant is the cost of healthcare services. In many developing countries, including Nigeria, healthcare financing relies heavily on out-of-pockets payments. High cost of consultation, medication, and transportation can discourage individuals from seeking care, leading to poor health outcomes (World bank; 2021).

The availability of healthcare personnel is also a major factor affecting accessibility. Shortages of doctors, nurses, and other healthcare professionals limit the capacity of healthcare facilities to provide timely and inadequate services. This often results in long waiting times and reduced quality of care. Additionally, transportation and infrastructure play a significant role in health care accessibility and city livability (Akanmu, Gbadamosi & Omole, 2022). Poor road network and lack of reliable transportation systems can make it difficult for individuals to reach healthcare facilities,

particularly on semi-urban and rural areas. Other determinants include cultural beliefs, level of education, and awareness of healthcare services. These factors influence individuals' decisions to seek medical care and their ability to navigate the healthcare system effectively. The model provides a comprehensive framework for understanding the factors that influence healthcare utilization. According to Asante and Mills (2022), individuals demand healthcare services not for their own sake but as a means of improving their stock of health. Healthcare accessibility play a crucial role in this model, as easier access to healthcare services reduces the cost of investing in health. When healthcare services are more accessible through lower cost, shorter-distance, and availability of personnel-individuals are more likely to seek medical care, thereby improving their health outcomes.

This conceptual underpinning is particularly relevant to semi-urban settings such as Alakia Primary Healthcare Centre, where barriers to access can significantly affect individual ability to invest in their health. Together, these theoretical frameworks provide a strong foundation for analysing the relationship between health care accessibility and healthcare outcome in semi-urban areas. According to Babatunde (2023), healthcare utilization is determined by three main categories of factors: predisposing factors include demographic characteristics, such as age, gender, and education. Enabling factors refer to the resources that facilitate or hinder access to healthcare, such as income, availability of healthcare facilities, and transportation.

2.2 Empirical Review

Empirical studies on healthcare accessibility and healthcare outcomes have increasingly adopted quantitative and econometric approaches to establish casual relationships between variables. These methods provide more robust evidence compared to descriptive analysis. Several studies have employed Ordinary Least Square (OLS) regression to estimate the relationship between healthcare accessibility variables and health outcomes. OLS is widely used due to its simplicity and ability to provide unbiased estimates under certain assumptions (Wooldridge, 2012). For example, researchers have used OLS to estimate the impact of distance to healthcare facilities on healthcare utilization and recovery rates. Panel Data Techniques, such as fixed effects and random effects models, have also been applied in healthcare studies. These methods account for unobserved heterogeneity across individuals or regions, providing more accurate estimates of the impact of healthcare accessibility on outcomes (Baltagi, 2021). This study contributes to the literature by applying econometric technique - specifically regression analysis to examine the relationship between healthcare outcomes at the facility level. With focus on Alakia Primary Health Care Centre, this study provides context specific insights.

Similarly, the World Health Organization (2020), utilized panel date analysis to evaluate healthcare systems across countries. The study found that increased investments in health outcome, particularly in low-income settings. In addition, Logistic Regression Model have been used to analyse binary health outcomes, such as whether an individual seeks healthcare or not (Hosmer, Lemeshow, and Sturdivant, 2013). These models are particularly useful when the dependent variable is categorical. Also, a study by World Bank (2021) employed cross-country regression analysis to examine the

relationships between healthcare access indicate and health outcomes. The findings revealed that improvements in healthcare accessibility, particularly reductions in out-of-pocket expenditure, significantly reduce mortality rate and improve life expectancy.

In Nigeria, empirical studies have also applied econometric techniques to analyse healthcare access. The National Bureau of Statistics (2022) used descriptive and inferential statistics to highlight disparities in healthcare access. However, more advanced econometric techniques are needed to establish casual relationships. A critical appraisal of the literature reveals however, several important gaps. First, most studies adopt a macro-level approach, focusing on national or regional data. While these studies provide useful insights, they often overlook the specific challenges faced by semi-urban communities and individual healthcare facilities. As a result, the unique characteristics of semi-urban areas are not adequately captured. This limited application of econometric techniques in analysing the relationship between healthcare accessibility and healthcare outcomes at the micro level. Many studies rely on descriptive statistics, which may not fully capture the casual relationships between variables. The use of econometric models can provide more robust and reliable estimates of the impact of accessibility on health outcomes.

Existing studies often focus on a single dimension of healthcare accessibility, such as distance or cost, without considering the combined effect of multiple factors. However, healthcare accessibility, is a multidimensional concept, and a comprehensive analysis requires the inclusion of various determinants such as availability of healthcare personnel, waiting time, and infrastructure. Additionally, there is a lack of context-specific studies focusing on semi-urban healthcare facilities in Nigeria. Facilities such as Alakia Primary Healthcare Centre operate under unique conditions that differ from urban hospitals and rural clinics. Understanding these conditions is essential for designing effective healthcare policies and interventions. This study seeks to address these gaps by conducting a facility-level econometric analysis that incorporates multiple dimensions of healthcare accessibility. By focusing on a specific semi-urban healthcare Centre, the study provides a more detailed and context-specific understanding of the relationship between healthcare accessibility and health outcomes.

3.0 Materials and Methods

3.1 Methodology

This study adopts a cross-sectional research design. A primary source of data was utilised. The descriptive aspect helps to explain the level of healthcare accessibility and outcomes among residents, while the econometric approach enables the researcher to quantitatively analyse the relationship between healthcare accessibility and health outcomes using statistical models. The research is conducted at Alakia Primary Healthcare Centre, Ibadan, located in Egbeda Local Government Area, Oyo State, Nigeria. Alakia Primary Healthcare Centre provides basic primary healthcare services such as out-patient care, antenatal and post-natal services, immunization, family planning, and health education to residents within its catchment communities.

The sample of this study consists of selected respondents of 500 from Alakia Primary Healthcare Centre, Egbeda Local Government Area, Oyo State, Nigeria. The study adopted purposive sampling technique in selecting respondents so as to provide

relevant information regarding healthcare accessibility and healthcare outcome. A total number of 500 respondents were selected, a structured questionnaire was administered to them for a period of two weeks in which the researcher visits the hospital often to have access to the patients after they are been attended too, out of the 500 administered questionnaires 385 were retrieved and others are due to non-responses. Copies of the questionnaire were distributed directly to respondents within the healthcare centre, whereby the researcher explained the purpose of the study to respondents and guided them where necessary to ensure proper understanding of the questions. The respondents were given adequate time to complete the questionnaire, after which the completed copies were collected immediately to prevent loss and ensure a high retrieved rate. The structured questionnaire designed by the researcher are close-ended questions structured in sections to obtain relevant information from respondents; section A; focused on socio-economic characteristics of respondents such as age, gender, marital status, educational qualification, and occupation, while section B; also contained questions relating to health care accessibility, availability of health facilities, affordability and distance, and relating to healthcare outcomes experienced by respondents. The questionnaire format enabled respondents to provide answers easily while ensuring uniformity in responses collected for statistical analysis.

The collected data will be analysed using SPSS (Statistical Package for Social Sciences) which refers a comprehensive suite for tools for processing quantitative data. Also, descriptive statistics depict the pattern of information which provides insights into age, occupation, and the respondent's distance. These measures are measures of central tendency (mean, median, and mode) and measure of dispersion (standard deviation). Inferential statistics were used to make conclusions and generalizations based on the data collected from sample population. It also was used to infer conclusions from the responses of the respondents through a prepared hypothesis. Where the decision rule was: reject H_0 if p-value is greater than 0.05.

In addition, regression analysis is a statistical device that estimates or predicts the unknown values of one variable from the unknown values of another variable. There are two types of variable in regression analysis: independent variable, and dependent variable. The variable whose value is influenced or to be predicted is called dependent variable. A dependent variable is what happens as a result of the independent variable. The variable which influences the value or is used for prediction is called independent variables. To achieve the result, the model, give a greater clarification of all parameters used, it includes:

Derivation of regression analysis formula

Let $Y = a + bx$ be least square estimate

$Y = a + \beta xi + Ni$

ΣNi

$Y = a + \beta xi + Ni$

$Ni = Y - - \beta xi$

$\Sigma Ni^2 = \Sigma(Y - - \beta Xi)$

$$\frac{\delta Ni^2}{\delta a} = 2\Sigma(Yi - a - \beta Xi) \quad \text{------- i}$$

$$\frac{\delta \Sigma Ni^2}{\delta \beta} = -2Xi\Sigma(Yi - a - \beta)$$

$$\frac{\delta \Sigma Ni^2}{\delta a} = 0$$

$$\frac{\delta \Sigma Ni^2}{\delta \beta} = 0$$

$-2\Sigma(Yi - a - \beta Xi^2) = 0$ ------- (ii)

$\Sigma(Yi - a - \beta Xi) = 0$

$\Sigma Xi(Yi - a - \beta Xi) = 0$ -------- (iii)

From (iii)

$\Sigma Yi - na - \beta \Sigma Xi = 0$

$$\frac{na}{n} = \frac{\Sigma Yi}{n} - \frac{\beta 2Xi}{n}$$

$a = Yi - \beta Xi$ --------- (iv)

From equation (iv)

$\Sigma Xi(Yi - a - \beta Xi) = 0$

$\Sigma XiYi - aXi - \beta \Sigma Xi^2 = 0$ -------- (v)

From equation (v)

$$a = \frac{\Sigma Yi}{n} - \frac{\beta \Sigma Xi}{n}$$

From equation (v)

$$\Sigma XiYi - \Sigma Xi\left(\frac{\Sigma Yi}{n} + \frac{\beta Xi}{n}\right) - \beta \Sigma Xi^2 = 0$$

$$\Sigma XiYi - \frac{\Sigma Xi \Sigma Yi}{n} + \frac{\beta(\Sigma Yi)^2}{n} - \beta \Sigma X^2 = 0$$

Multiply through by n

$n\Sigma XiYi - \Sigma xi\Sigma Yi + \beta(\Sigma Xi)^2 - n\beta \Sigma Xi^2 = 0$--- vi

$n\Sigma XiYi - \Sigma xi\Sigma Yi = n^2\Sigma Xi^2 - \beta(\Sigma X)^2$

$$\frac{n\Sigma XiYi - \Sigma Xi Yi}{n\Sigma Xi^2 - (\Sigma Xi)^2} = \frac{\beta(n\Sigma Xi^2 - (\Sigma X)^2}{n\Sigma Xi^2 - (\Sigma Xi)^2}$$

$$B = \frac{n\Sigma XiYi - \Sigma Xi\Sigma Yi}{n\Sigma Xi^2 - (\Sigma Xi)^2} \quad \ldots vii$$

The regression model is as follows

$Y = \beta_0 + \beta_1 X_1$

Where β_0 = constant variable

β_1 = distance to health centre

β_1 = affordability

β_1 = availability of medical staff.

4.0 Results and Discussion

This presents the findings from the Econometric Analysis on Health Care Accessibility and Health Care Outcome in Semi Urban Area; Alakia Primary Health Care Centre, Egbeda Local Government Area, Ibadan, Oyo State, Nigeria. The data analysed in this chapter were generated from questionnaires administered to respondents at Alakia Primary Health Care Centre. A total of 385 respondents, and all

were properly completed and returned, while 115 responses were not retrieved. returned, representing a response rate of 77%. The analysis was carried out using the Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequency distribution tables and percentages were used to analyse respondents' demographic characteristics and research questions, while inferential statistics and regression analysis were used to test relationship between health care accessibility and health outcomes.

4.1 Socio-Economic Attributes

The figure 1 showing the bar chart of respondents who answers the required closed-ended questions administered via a well-structured questionnaire indicate that, female respondents have a slightly higher representation of 62 which is (51.7%) compared to male respondents of 58 which is (48.3%), while figure 2, it shows that the age group of 25-34 has the highest response with 68(56.7%), while the 15-24 and 35-44 group has a response of 25 (20.8%) and 45-100 has the lowest response. The figure 3 bar chart shows that the Single has the highest rate of response with 67 (55.8) followed by the Married with 34 (28.3%), Divorced with 16 (13.3%) and widowed with 3 (2.5%).

Also, bar chart in figure 4 above that tertiary level of education has the highest pick with 97 (80.8%), secondary has 16 (13.3%), no formal came up with 4 (3.3%), and primary has 3 (2.5%). Figure 5 show that the largest group, 50 (41.7%) are students, following those Self-employed accounts for 39 (32.5%), unemployed 16 (13.3%) and civil servant 15 (12.5%). This explains that from all indication, students are part of those that visit the centre regularly, after that those that ae business owners also patronise the health centre as well as civil servants and un-employers of labour. This indicate that there are various number of individuals who visits the health centre for health issues, consultation and many other reasons.

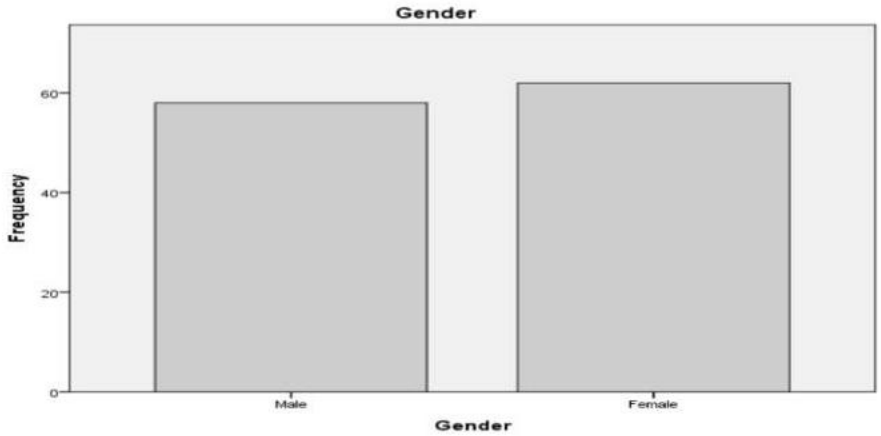


Figure 1: Genger Classification of Respondents

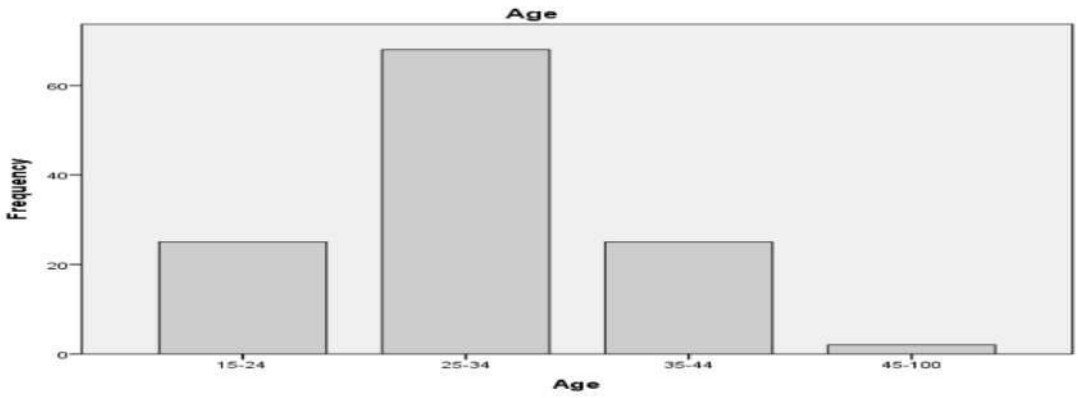


Figure 2: Age Classification of respondents at the Primary Health Care Centre

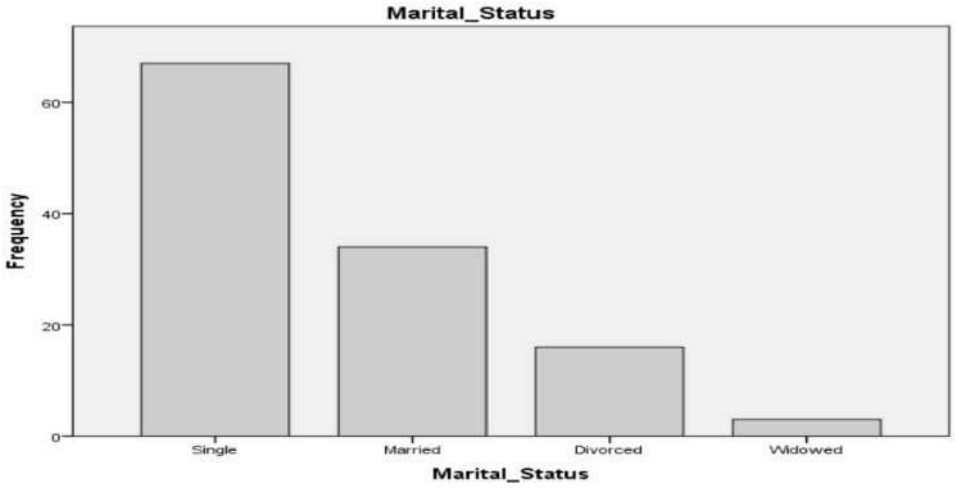


Figure 3: Marital Status of Respondents

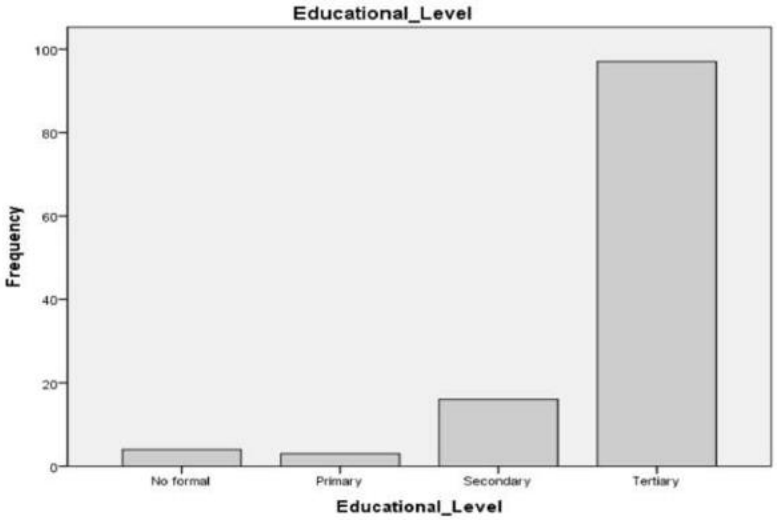


Figure 4: Educational Level of Respondents



Figure 5: Occupation Characteristics of Respondents

4.2 Personal Characteristics

The Table 1 shows that the largest income group are ₦30k-₦70k and ₦70k-₦150k earners, accounting for 123 (31.7%) each, followed by >₦150k earners at 92 (24.2%), while <₦30k represents the lowest (12.5%) 50 of the participants, the table below also shows the distance taken by respondents to get to the health Centre. Also, from the table above 177 (45.8%) of the respondents took <1km to the health Centre, closely followed by 1-5km at 166 (43.3%), then >5km represents 42 (10.8%). From the Table 2, most respondents trekked which had 166 (42.5%) Rate, followed by motorcycle 107 (28.3%), Car accounting for 73 (19.2%), public transport represents 38 (10.0%). From the table, the time taken to be responded to at the health centre was considered as given below; <30mins was the most picked accounting for 63 (52.5%),

followed by 30-60mins which had 161 responses with (41.7%) rate, and >1hour with the lowest response 23 (5.8%). The result in Table 3 indicate that affordable raised 238 (61.7%), followed by very affordable with 116(30.0%), and not affordable accounts for 31 (8.3%). This indicates that respondents can afford to buy for specific drugs for usage.

Table 1: Socio-economic and Trip Characteristics of Respondents

Indicators	Variable	Frequency	Percent
Income level	<₦30k	50	12.5
	₦ 30 - ₦ 70k	123	31.7
	₦ 70 - ₦ 150k	123	31.7
	>₦ 150k	92	24.2
	Total	385	100.0
Distance taken	<1km	177	45.8
	1-5km	166	43.3
	>5km	42	10.8
	Total	385	100.0
Transport means	Trekking	166	43.1
	Motorcycle	107	28.3
	Car	73	19.2
	Public Transport	38	10.0
	Total	385	100.0
Trip duration	<30mins	200	52.5
	30-60mins	161	41.7
	>1hour	23	5.8
	Total	385	100.0

Source: field work (2026)

4.3 Health Accessibility and Affordability

Table 2 shows the distribution of each response for availability of drugs. From the table above 356 (92.5%) of respondents agreed that there was availability of drugs while 29 (7.5%) disagreed. This shows that there is availability of drugs at the health centre that can easily be access by the patients in the hospital. Also, from the Table 3, 'adequate' is the most picked by respondents with 227 participants (59.2%) rate, followed by 'fair' with 135 participants (35.0%), and 'inadequate' with 22 participants (5.8%), this shows that medical staff are adequately available to response to patients whenever they coming visit the hospital. The table also shows the distribution of each response for Visit Frequency.

Moreover, from Table 2 most respondents visited 'occasionally' with 154 participants (40.0%), and 'rarely' and 'regularly' with 119 (30.8%) and 112 (29.2%) participants respectively, this shows that patients visit the hospital occasionally for medical issues and treatment. The result in Table 5 shows that 'quality' had the highest response rate with 196 (50.8%), while 'cost' raised 100 (25.8%), and 'distance' and 'availability of drugs' had 70 (18.3%) and 19 (5.0%) response rate respectively, this indicate that the reason why patients visit the health centre is because of the quality of service rendered by the staff. The table also shows the distribution health status. From the table most respondents had 'Excellent' health status with 60 (50.0%), closely

followed by 'Good' at 55 (45.8%) and 'Fair' and 'Poor' with 3 (2.5%) and 2 (1.7%) each. This indicate the health status of patients greatly increase after consultation. The result shows that 365 respondents with (95.0%) rate agreed there was improvements after visit while 20 respondents with (5.0%) rate disagreed. The table also shows the distribution of each response for 'Does Accessibility Affect Health Care'. This indicate that there is improvement after every visit to the health centre. From the table, 250 respondents with (65.0%) rate picked 'Yes' while 135 respondents with (35.0%) rate picked 'No'. This indicate that patient's health increases after consultation.

Table 2: Health Accessibility and Affordability Attributes of Respondents

Indicator	Variables	Frequency	Percent
Extent of affordability	Very Affordable	116	30.0
	Affordable	238	61.7
	Not Affordable	31	8.3
	Total	385	100.0
Drug affordability	Yes	356	92.5
	No	29	7.5
	Total	385	100.0
Medical Staff Availability	Adequate	227	Valid
	Fair	135	35.0
	Inadequate	22	5.8
	Total	385	100.0
Visitation Response	Regularly	112	29.2
	Occasionally	154	40.0
	Rarely	119	30.8
	Total	385	100.0
Facility choice	Cost	100	Valid
	Distance	70	18.3
	Quality	196	50.8
	Availability of Drugs	19	5.0
	Total	385	100.0
Health Status	Excellent	192	50.0
	Good	176	45.8
	Fair	9	2.5
	Poor	7	1.7
	Total	385	100.0

4.4 Model Formation of Coefficients

4.4.1 Hypothesis Testing I

H_0: Distance to health Centre has no significant impact on healthcare outcome.
H_1: Distance to health Centre has significant impact on healthcare outcome.

Table 3 shows that the p-value is 0.190, which is greater than 0.05 then we accept the null hypothesis, thus the model $Y = 0.985+0.039X_1$ is not statistically significant. The model summary in table 10 shows a positive relationship (R= 0.120) between improvement after visit and distance to health Centre. The R^2 value of 0.015 means that

1.5% of the variation in improvement after visit is explained by the predictor. The adjusted R^2 (0.006) confirms the model reliability. The small standard error (0.218) indicates accurate predictions.

Table 3: Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.985	.053		18.521	.000
	Distance_To_Health_Centre	.039	.030	.120	1.318	.190

a. Dependent Variable: Improvement_After_Visit

Source: field work (2026)

The estimated regression model is: $Y=\beta_0 + \beta_1 X_1$

$$Y= 0.985 + 0.039X_1$$

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.083	1	.083	1.738	.190[b]
	Residual	5.617	118	.048		
	Total	5.700	119			

a. Dependent Variable: Improvement_After_Visit

b. Predictors: (Constant), Distance_To_Health_Centre

Source: field work (2026)

Table 10: Predictive Power of the Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.120[a]	.015	.006	.218

a. Predictors: (Constant), Distance_To_Health_Centre

Source: field work (2026)

4.4.2 Hypothesis Testing II

H_0: Healthcare cost has no significant effect on healthcare outcomes.

H_1: Healthcare cost has significant effect on healthcare outcomes.

Table 4 shows that the p-value is 0.352, which is greater than 0.05 then we accept the null hypothesis, thus the model $Y = 0.993 + 0.032X_1$ is not statistically significant. The model summary in table shows a strong relationship (R=0.086) between improvement after visit and affordability. The R^2 Value of 0.007 means that 0.07% of the variation in improvement after visit is explained by the predictor. The adjusted R^2

(0.001) confirms the model's reliability. The small standard error (0.219) indicates accurate predictions.

Table 4: Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.993	.065		15.357	.000
	Affordability	.032	.034	.086	.934	.352

a. Dependent Variable: Improvement_After_Visit

Source: Field Work (2026)

Regression Model= $Y=\beta_0+\beta_1X_1$

$Y=0.993+0.032X_1$

Table 5: Test for linearity of the Model

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.042	1	.042	.873	.352[b]
	Residual	5.658	118	.048		
	Total	5.700	119			

a. Dependent Variable: Improvement_After_Visit

b. Predictors: (Constant), Affordability

Source: Field Work (2026)

Table 6: Predictive Power of the Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.086[a]	.007	-.001	.219

a. Predictors: (Constant), Affordability

Source: Field Work (2026)

4.4.3 Hypothesis Testing III

H_0: Availability of healthcare personnel has no significance on healthcare outcomes.

H_1: Availability of healthcare personnel has a significance on healthcare outcomes.

Table 7 shows that the p-value is 0.000, which is less than 0.05 then we reject the null hypothesis, thus the model $Y = 0.876 + 0.119X_1$ is statistically significant. The model summary in Table 8 shows a strong relationship (R=0.329) between improvement after visit and availability of medical staff. The R^2 Value of 0.108 means that 10.8% of the variation in improvement after visit is explained by the predictor.

The Adjusted R^2(0.101) confirms the model's reliability. The small standard error (0.208) indicates accurate predictions

Table 8: Regression analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.876	.050		17.623	.000
	Availability_Of_Medical_Staff	.119	.031	.329	3.783	.000

a. Dependent Variable: Improvement_After_Visit

Source: Field Work (2026)

Regression model $Y = \beta_0 + \beta_1 X_1$

$Y = 0.876 + 0.119X_1$

Table 9: Test for linearity of the Model

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.616	1	.616	14.308	.000[b]
	Residual	5.084	118	.043		
	Total	5.700	119			

a. Dependent Variable: Improvement_After_Visit

b. Predictors: (Constant), Availability_Of_Medical_Staff

Source: Field Work (2026)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.329[a]	.108	.101	.208

a. Predictors: (Constant), Availability_Of_Medical_Staff

Source: Field Work (2026)

5.0 Conclusion and Recommendations

This study examined the relationship between healthcare accessibility and healthcare outcomes among patients attending Alakia Primary Health Care Centre in Egbeda Local Government Area, Ibadan, Oyo State. The demographic findings revealed that female respondents (51.7%) were slightly more than male respondents (48.3%). The majority of respondents were between the ages of 25–34 years (56.7%), while most were single (55.8%). In terms of educational attainment, respondents with tertiary education constituted the largest proportion (80.8%). Students formed the highest occupational group (41.7%), while the majority of respondents earned between

₦30,000–₦70,000 and ₦70,000–₦150,000 monthly. Findings on healthcare accessibility showed that most respondents lived close to the health centre, with 45.8% residing less than one kilometre away and 43.3% living within one to five kilometres. A large proportion of respondents reached the facility by trekking (42.5%), while more than half (52.5%) spent less than thirty minutes travelling to the health centre.

The majority of respondents considered healthcare services affordable (61.7%), and 30.0% described them as very affordable. Furthermore, 92.5% of respondents confirmed the availability of drugs, while 59.2% rated the availability of medical personnel as adequate. The study also revealed that respondents generally had positive perceptions of healthcare outcomes. About 95.0% reported improvement in their health condition after visiting the facility, while 50.0% rated their overall health status as excellent and 45.8% rated it as good. In addition, 65.0% of respondents believed that healthcare accessibility influences healthcare outcomes. The regression analysis showed that distance to the health centre had a positive but statistically insignificant effect on healthcare outcomes ($p = 0.190 > 0.05$). Therefore, the study accepted the null hypothesis that distance to the health centre does not significantly affect healthcare outcomes among the respondents. Similarly, healthcare cost (affordability) was found to have a positive but statistically insignificant effect on healthcare outcomes ($p = 0.352 > 0.05$). Consequently, the null hypothesis stating that healthcare cost has no significant effect on healthcare outcomes was accepted. However, the availability of healthcare personnel had a positive and statistically significant effect on healthcare outcomes ($p = 0.000 < 0.05$). The result indicated that improvements in the availability of medical staff significantly enhance healthcare outcomes. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

In conclusion, the study found that while distance and healthcare cost did not significantly influence healthcare outcomes, the availability of healthcare personnel played a significant role in improving healthcare outcomes among patients attending Alakia Primary Health Care Centre. This suggests that ensuring adequate healthcare personnel is critical for achieving better health outcomes in semi-urban communities. Based on the findings of this study, it can be concluded that healthcare accessibility and affordability did not significantly influence outcomes among respondents attending Alakia Primary Healthcare Centre. However, the availability of healthcare personnel was found to have a significant positive effect on healthcare outcomes. The study therefore concludes that the presence of qualified and adequate personnel plays a vital role in improving the quality of healthcare services and patient outcomes in semi-urban communities.

Therefore, the following recommendations are made include that government and health authorities should increase the number of qualified healthcare personnel in primary healthcare centres to improve service and healthcare outcomes, continuous training and professional development programmes should be organized for healthcare workers to enhance their competence and efficiency, although accessibility was not found to be significant, efforts should still be made to improve transportation networks and healthcare infrastructure to ensure easier access to health facilities, healthcare providers should continue to implement affordable healthcare policies to encourage utilization of healthcare services by community members, and adequate funding should

be provided to primary healthcare centre to enable them recruit and retain qualified healthcare professionals.

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