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Women's HealthCare Accessibility and Utilisation Post-COVID-19 in the Niger-Delta Region of Nigeria

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Abstract: Globally, healthcare systems have experienced substantial changes in accessibility and utilization during and after the COVID-19 pandemic. A significant reduction in healthcare utilization has been reported worldwide, particularly in the post-pandemic period. This study examines the impact of multiple determinants on healthcare accessibility and utilization following the COVID-19 pandemic. Quantitative analysis was conducted using data from a household survey of 2,423 rural female participants in Delta and Edo States, in the Niger-Delta Region, Nigeria. SPSS 23 was used for statistical analysis, and ArcGIS 10.1 for map production. Descriptive statistics and multiple regression techniques were applied. The main findings reveal a notable shift in healthcare utilization from primary care to hospitals, largely due to perceived poor quality of rural clinics. The majority of participants were women (84%) with low or no income, primarily engaged in farming or trading. Key services accessed included maternal and child healthcare, such as prenatal care, delivery, and family planning. Twenty-four variables explained 77% of the variance in healthcare accessibility and utilization among rural women, a statistically significant result. Based on these findings, the study recommends increasing women's productivity and livelihoods, improving social infrastructure for gender equality, addressing the socioeconomic impacts of COVID-19, and encouraging both community and government participation in the healthcare system.

Keywords: Women's health; Accessibility; Utilization; COVID-19; Niger-Delta Region

1. Introduction

The COVID-19 pandemic has intensified global attention on healthcare accessibility and utilisation, particularly for women who face longstanding gender-based disparities in health services [1]. While some progress has been made in improving overall population health care, setbacks related to pandemic disruptions have impaired progress toward Sustainable Development Goal (SDG) 3 and heightened barriers to universal health coverage [2]. Inequalities in maternal, child, and adolescent health services have grown since the pandemic, and barriers such as childcare needs [3] and limited access to sexual and reproductive health services disproportionately affect poor women. Economic recovery efforts have also struggled to address these widening disparities in women's healthcare access.

Prior studies [53-56] before the pandemic consistently found that factors such as socioeconomic status (wealth status, income level, education), geographic location (urban vs. rural), and health insurance, health service availability, affordability and decisions significantly influence women's access to and utilization of healthcare, particularly maternal healthcare. Specifically, higher wealth, education levels, and having insurance were associated with greater access and use of services for antenatal and delivery care, while being in a rural area, having lower education, or being unemployed

were associated with lower utilization rates. Other individual and community factors include media exposure, marital status, age, as well as physical distance, cost, or quality of care, which were strongly associated with service use. [4] State women still have an unequal share of problems and agony several years after COVID-19. Several women have undergone changes such as wellness protagonists, digital bloomers, and climate catalysts that have impacted their mental and physical well-being. The transformations span from wellness protagonists to climate catalysts, with women building resilience for current and future global crises. In the United States, [5] findings from the 2020 KFF women's health survey show that lower-income women are in poor health, and some are suffering from chronic health conditions. Over ninety percent (90%) of these women have seen a healthcare provider, mostly at a health centre or clinic. The findings also showed that there are marked disparities between Black, Asian, and White women's healthcare service utilisation and their healthcare experiences. A high percentage of white and black women are on regular medication.

Women's healthcare accessibility and utilisation entail analysing multiple levels of determinants. Education, employment status, and income have been identified as socioeconomic factors [6-8], while age, ethnicity/race, gender, and place of residence are demographic factors [9, 10]. Other factors are related to the healthcare system level, which includes availability of healthcare providers and quality of care, insurance coverage, and transportation infrastructure [11-13]. During the pandemic, access to telehealth emerged due to poor accessibility and utilisation of healthcare delivery services [14, 15]. This has led to the fast-tracked use of technology and digital literacy, which facilitates real-time monitoring of personalized medicine and improves patient outcomes [16, 17]. This telehealth approach encourages consultations, monitoring, and diagnosis in rural areas and offers twenty-four-hour accessibility to healthcare services [50].

In low and middle-income countries, [18, 51] reviews showed that apart from financial and distance constraints, four other levels of determinants affect healthcare services among women. These factors comprise individual, interpersonal, community, and system levels, including variables such as economic status, knowledge and beliefs, social norms, family and community support, transportation facilities, availability of service providers, and health insurance. These studies recommended cost-effective and culturally appropriate approaches to improve women's access. There is evidence of poor access to and utilisation of healthcare information among reproductive women in low/middle-income countries [19]. The study also provided proof of interventions that enable access to health information in the countries compared to high-income countries. Individual evidence was on accessibility, financial accessibility/affordability, connectivity, and challenges in accessing and using healthcare services among reproductive women. [20] A cross-sectional study reports on women's autonomy, which is a function of some of the aforementioned factors, as well as women's empowerment and social networks. In Beijing, [21] analysed healthcare density and spatial distribution of facilities/services among urban women in China. The findings showed that women's healthcare requirements and needs include both physical and psychological treatments, amongst other services. A large percentage of women (64%) have unsatisfactory reports about healthcare facilities, even in urban areas.

Recent studies across Africa have identified determinants influencing access and utilisation of women and maternal healthcare services [22-24]. The factors identified as barriers to access and patronage include age, women's and spouse education, household wealth status, residence (urban/rural), unplanned pregnancy, marital status, and media exposure. East and sub-Saharan Africa have about forty percent (40%) low healthcare access when compared to the SDG 3.8 target of universal healthcare coverage. Healthcare access and patronage in Nigeria are hindered by age, monthly income, cultural beliefs, shortage of healthcare professionals, conducive and clean environment, staff/patient inter-personal relationship, treatment of health problems, prescription of effective drugs, and nature of illness, poor roads, and poor health insurance coverage [25-28]. This leads to poor patronage, self-medication, and the use of traditional/unorthodox medicine remedies, especially among rural residents.

Across Nigeria, most studies measure maternal and child healthcare accessibility and utilisation [29-32]. These studies showed the determinants hindering and improving healthcare patronage across rural and urban areas in the country. Maternal healthcare studies show that reproductive women have low and moderate utilisation of healthcare facilities in the country. These maternal healthcare services are some of the most accessed and utilised forms of healthcare delivery among women. Before the COVID-19 pandemic, similar determinants were identified among reproductive women. The determinants are place of residence, history of birth, maternal education, distance, income, age, maternal autonomy, and quality of healthcare that affect maternal healthcare utilisation [52, 53]. Other determinants identified are healthcare providers and hospital beds increase the usage of healthcare facilities; population density worsens the quality of healthcare services, while female account ownership, education, and female household head enhance access to healthcare. Health services utilisation is a proof of access to healthcare in Africa [33, 34].

Women in the Niger Delta face intertwined socioeconomic, cultural, and environmental barriers that, together, critically impede their access to healthcare. Studies [58-66] across the region highlight these barriers, which manifest in low utilization of formal health services and persistently poor health outcomes, especially in maternal and child health (57-62). Sociocultural barriers reinforce these challenges by limiting women's autonomy and deterring them from seeking qualified healthcare, due to patriarchal norms, traditional beliefs, and negative provider attitudes. Environmental and systemic failures include inadequate infrastructure, geographic isolation, environmental degradation, shortages of trained professionals, and inefficient healthcare systems. The challenging terrain and inadequate road networks in the Niger Delta hinder access to healthcare facilities for women in remote or riverine communities. Many facilities are poorly equipped, lack essential drugs, and do not provide 24-hour services. Oil exploration has caused widespread pollution of air, water, and soil, resulting in serious health risks for women and children. Contaminated water sources and air pollution have increased rates of respiratory diseases and other illnesses. Staffing shortages, low morale, and brain drain contribute to long waiting times and reduced quality of care [57, 61-62]. Systemic issues, including governance challenges, inadequate funding, and poor distribution of medical supplies, are prevalent throughout Nigeria's healthcare sector. Political interference also influences the location and construction of health facilities. In view of the recent pandemic, healthcare access and utilisation are expected to rise due to public awareness of healthcare challenges. With reported poor utilisation of healthcare services across geographical areas, this research examines the factors influencing women's access and utilisation of healthcare after COVID-19 in the Niger-Delta Region of Nigeria.

Objectives of the Research

This research addresses the following objectives:

- To ascertain the social, economic, and demographic characteristics of women in the research area and
- To examine the factors influencing accessibility and utilisation of healthcare services in Delta and Edo States.

Conceptual Framework

The related concepts applied in this research include access and utilisation of healthcare as well as the Andersen behavioural health model. The concept of healthcare access is "having timely use of personal health services to achieve the best possible health outcome" [35, 36]. Based on the complex nature of access to healthcare, five dimensions of healthcare were identified: accessibility, approachability, acceptability, availability, accommodation, affordability, and appropriateness [37]. The concept of access is multi-dimensional, and from the patient's perspective, it is based on the five As: Adequate, Accessible, Affordable, Appropriate, and Available [38]. This perspective in Europe acknowledged access as identifying healthcare needs; utilizing the healthcare services and being satisfied with the met healthcare services.

The use of healthcare is a function of the need for care, the ability to recognize the need for and to obtain care, and the access to that care. The healthcare services needed are strongly correlated with healthcare use. These services can be needed but not accessed, and others are utilized after following the due process. [39] defines healthcare utilization as the "description of the use of services by persons to prevent and cure health problems, promoting maintenance of health and well-being, or obtaining information about one's health status and prognosis". The healthcare utilization concept is the use of healthcare devices, drugs, procedures, and services to preserve human health and well-being, prevent and treat health problems, and obtain information on health status and prognosis [40]. The conceptual model of healthcare utilization by Andersen's behavioural model [41] is used to assess factors influencing individual (women's) healthcare needs (Figure 1). This is based on three main characteristics of an individual in using the healthcare system.

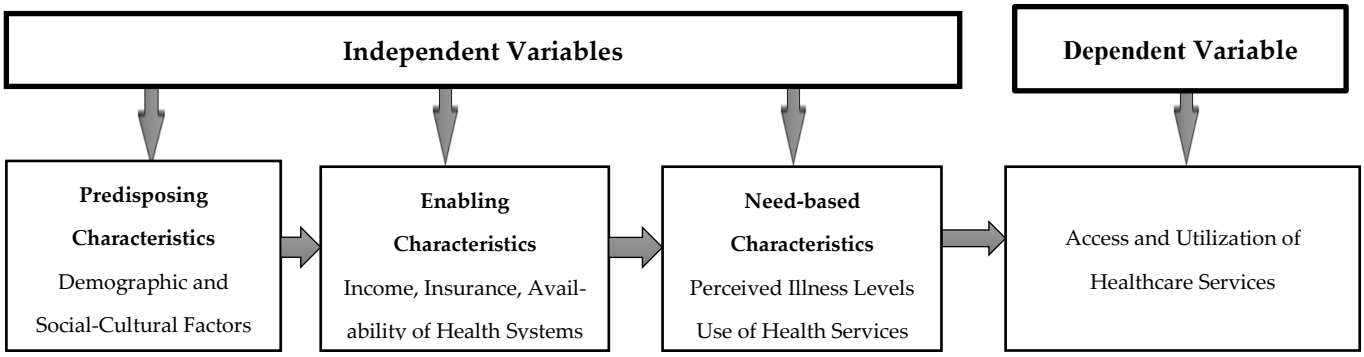

Figure 1: Modified Andersen Behavioural Model (2005)

2. Materials and Methods

The research area comprises Delta and Edo States, which are part of the Niger Delta region of Nigeria. The Niger Delta region is situated between longitudes 5^0E to 8^0E and latitudes 4^0N to 6^0N. It is about 29,900Km^2 which covers the natural delta of the River Niger [42]. This region comprises oil-producing states, namely Delta, Edo, Bayelsa, Abia, Akwa Ibom, Cross Rivers, Imo, Ondo, and Rivers States. Delta state is regarded as one of the restive states in the region. The region has over 300 settlements with over 40 ethnicities and more than 120 languages. The main occupation and trade in the region is farming, fishing, and oil exploration which boost the country's national revenue. This region lacks basic infrastructures (roads, health care facilities, schools, and potable water). Also, the region is characterised by poor life expectancy, high infant mortality rate, illiteracy, unemployment, low-income revenue, extreme poverty, and development [43, 44].

Delta State is located on Longitude $5^0$00′ and $6^0$45′ East of the Greenwich Meridian, and Latitude: $5^0$00′ and $6^0$30′ North of the Equator, covering about 16,842 Km^2. The state has twenty-five (25) Local Government Areas. Edo State is located between Latitude $05^0$44′N and $07^0$34′N of the Equator and between Longitude $05^0$04′E and $06^0$45′E. The land area covers 19,635 Km^2, having 18 local government areas [45, 46]. The land elevation lies between 500 feet (150 m) and 1,800 feet (550 m) from the south and north respectively. Edo State historically is known as the Edo-speaking people in the Benin Empire (Kingdom of Benin).

Six local government areas from both Delta and Edo States were selected for this analysis. They include Ethiope East, Ika South, Isoko South, Esan Central, Estako East, and Ovia South-west (Figure 2). A multistage and random sampling method was applied in household selection. The research selected six Local Government Areas (LGAs)—three in Edo (Esan Central, Etsako East, Ovia South-west) and three in Delta (Ethiope East, Ika South, Isoko South), which represented diverse ethnicities across the six senatorial districts in the region. The Multistage sampling involved dividing the two States into Local Government Areas, then the LGAs were divided into Geo-Political Wards, and the final stage

entailed dividing the Housing Blocks of 10 households each. Households were randomly selected using a Microsoft Excel function, and one adult female was interviewed per household. The research is about women's access to healthcare and utilisation; only female data were analysed. A questionnaire was used to collect data from 2423 female respondents based on the six LGAs projected female population of about 850,000 at a confidence level of 95%.

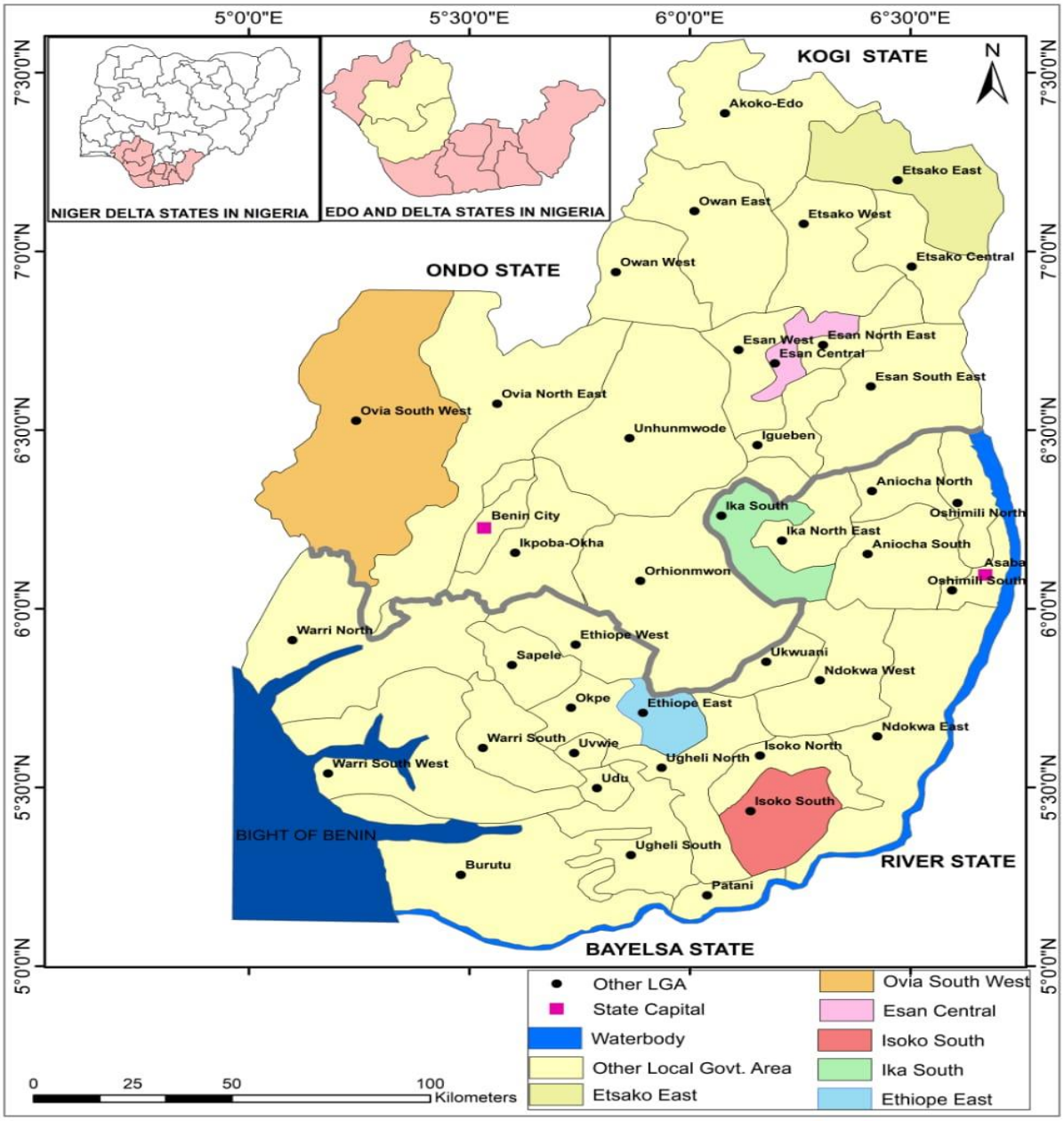

Figure 2: Edo and Delta States in the Niger-Delta Region, Nigeria

The Statistical Package for the Social Sciences (SPSS 23 version) software was used for the research. The research data instruments used simple descriptive statistics, percentages, tables, and multiple regression for analysis. Maps were produced using ArcGIS 10.1 software. Simple multiple regression was used to measure the predisposing, enabling and need variables on women's healthcare utilisation based on the Andersen behavioural model.

$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + bnxn + e$

Where Y = Dependent variable (Healthcare Utilisation)

a = Constant

b_1 b_2…. bn = partial regression coefficient

x_1, x_2, xn = independent variables (demographic, social, economic, cultural, health-related).

Y (Utilisation of Healthcare) = (demographic, social, economic, cultural, health-related).

Where: Y = age, residence, education, marital status, average monthly income, household size, insurance, autonomy, distance, type of healthcare provider, place of child/children healthcare, general family healthcare, common illnesses, mental health, live births, maternal services, prenatal services, delivery services, family planning services, immunisation, perceived illness level for (under-5years, older children, household members) and access to health care during Covid-19. Three of the independent variables (age, income, and distance) had data entry in the regression analysis on a ratio scale, while the other variables were classified on a nominal scale. Healthcare utilisation was measured on a nominal scale. Bivariate analysis included ANOVA to test the association between women's healthcare utilization and selected variables. All statistical analyses were the P = 0.05 level of significance. The distribution of household questionnaires among the 2423 female respondents is indicated in Table 1.

Table 1: Female Respondents in the Selected States of the Niger Delta Region

Research Area	**Respondents**	
	Frequency	**Percentages**
Delta State (1191)		
Ethiope East	371	15
Ika South	410	17
Isoko South	410	17
Edo State (1232)		
Esan Central	349	14
Estako East	443	19
Ovia South-West	440	18
Total	**2423**	**100**

3. Results

3.1. Social, Economic, and Demographic Characteristics among Respondents

The demographic and socioeconomic characteristics of respondents are presented in Table 2. Most respondents (81%) were aged 20–49 years, primarily from Ika South LGA in Delta State and Estako East and Ovia South-West LGAs in Edo State. Seventeen percent were aged 60 years and above, predominantly in Estako East LGA. These findings suggest that women in older age groups are less likely to migrate from the region compared to their younger counterparts.

Table 2: Social, Economic, and Demographic Attributes in the Research Area

		Delta State			**Edo State**			
		Selected Local Government Areas						
		Ethiope East LGA	**Ika South LGA**	**Isoko South LGA**	**Esan Central LGA**	**Etsako East LGA**	**Ovia South-West LGA**	**Total**
Age of Respondents	Less than 20 years	15	3	4	1	5	8	36 (02%)
	20-39 years	152	104	192	80	139	247	914 (37%)

	40 -59 years	151	225	166	184	197	144	1067 (44%)
	60 years and above	53	78	48	84	102	41	406 (17%)
Educational	No formal							
level	Education	67	46	23	54	233	28	451(18%)
	Primary education	101	145	95	142	129	186	798 (33%)
	Secondary education	153	185	228	111	70	211	958 (40%)
	Tertiary education	50	34	64	42	11	15	216 (09%)
Marital								
Status	Single	54	46	12	1	1	38	119 (05%)
	Married	224	145	326	248	323	345	1741 (72%)
	Widowed	72	185	51	79	111	37	450 (18%)
	Separated/ Divorced	21	22	21	21	8	20	113 (05)
Main								
Occupation	Farming	121	303	164	144	309	137	1178 (49%)
	Livestock Production	5	1	2	13	12	2	35 (02%)
	Trading	147	68	138	135	71	167	726 (30%)
	Public sector Employment	10	9	24	19	9	9	80 (03%)
	Private sector Employment	7	8	19	12	9	50	105 (04%)
	Unpaid Household Activities	31	16	24	22	22	39	154 (06%)
	Others	50	5	39	4	11	36	145 (06%)
Monthly								
Income	Less than N20,000	94	146	107	82	157	166	752 (31%)
	N20,000 – N30,000	134	103	162	129	114	135	777 (32%)
	N31,000 –N40,000	48	57	40	75	112	48	380 (16%)
	No income	95	104	101	63	60	91	514 (21%)
Total		**371**	**410**	**410**	**349**	**443**	**440**	**2423 (100%)**

Fifty-four per cent (54%) of the respondents had secondary and tertiary education in the region. They are found in Isoko South and Ika South LGAs in Delta State, while Edo State records high from Ovia South West. Primary education records thirty-three percent (33%), and eighteen percent (18%) of respondents have no formal education. This shows slight improvement among the people in the region in terms of educational achievement, particularly in Delta State.

The research reports that seventy-two percent (72%) of respondents are married from Ovia South-West and Isoko South LGAs. Those who have lost a spouse (widowed) are eighteen percent (18%) of the respondents, and they are mostly women from Ika South and Estako East LGAs. Those who are single and divorced/separated make up ten percent (10%)

of the respondents in the research area. This further explains the reason for non-migration among the older age groups of women. Almost half of the percentages of respondents (49%) say they are farmers in Estako East and Ika South LGAs. Traders make up about thirty percent (30%) of the respondents found in Ovia South-West and Ethiope East LGAs. Other occupations, such as unpaid housewives, public and private sector workers, and livestock producers, make up twenty-one percent (21%) of the respondents. This depicts an agrarian society where most women are family farm labourers and subsistent farmers. This monitors the level of economic activities and development indicators of the rural areas. Sixty-three percent (63%) of women are poorly remunerated in their main occupation, and twenty-one percent (21%) have no source of income. This implies that more than half of the respondents earn and live on less than $1 daily. Wealth distribution is synonymous with age and employment opportunities; in this circumstance, the type of employment status depicts individual earnings. This comprises women who are engaged in unpaid household activities and those serving as family farm labourers.

3.2. Prevalent illnesses across the research area

In the research area, the prevalent or common illnesses are depicted in Table 3, which was aggregated at the state level. The Niger Delta region has high rainfall and surface water, which makes it a malaria-endemic region. About seventy-six percent (76%) of respondents reported having suffered from malaria twelve (12) months before the research. There is a slightly higher prevalence rate recorded in Delta State than in Edo State in the research area. Most infants and children suffer more from malaria illness, and it could be fatal if not medically managed by health professionals.

Table 3: Prevalent illnesses suffered after COVID-19

Prevalent Illnesses		**Delta State**	**Edo State**	**Total**
Malaria	Yes	935	926	**1861 (76%)**
	No	256	306	**562 (24%)**
Diarrhoea	Yes	58	154	**212 (09%)**
	No	1133	1078	**2211 (91%)**
Accident	Yes	89	76	**165 (07%)**
	No	1102	1156	**2258 (93%)**
Dental	Yes	29	28	**57 (02%)**
	No	1162	1204	**2366 (98%)**
Skin Condition	Yes	36	53	**89 (04%)**
	No	1155	1179	**2334 (96%)**
Eye Condition	Yes	72	70	**142 (06%)**
	No	1119	1162	**2281 (94%)**
Ear, Nose, and Throat (ENT)	Yes	30	21	**51 (02%)**
	No	1161	1211	**2372 (98%)**
Others	Yes	170	207	**377 (16%)**
	No	1021	1025	**2046 (84%)**
Under-5 ill health	Yes	962	843	**1805 (75%)**
	No	229	389	**618 (25%)**
Total		**1191**	**1232**	**2423 (100%)**

Diarrhoea (09%) is another major cause of illness, especially among infants and children who are susceptible to severe infections, particularly in rural areas. This is also another cause of death among young children and infants. Food or water contamination, viral infection, pollution, and poor hygiene are common causes of child death from diarrhoea. In the region, this is reported more in Edo State than in Delta State. Other illness also accounts for sixteen percent (16%) of prevalent illnesses. Accidents (07%) are notably higher in Delta State than in Edo State in the region. Other illnesses, such as skin, eye, ear, nose, throat, and dental conditions, account for fourteen percent (14%) of illnesses in the research area. Access to and the use of healthcare are vital to the reduction of child and maternal morbidity/mortality in the rural areas of the region. This is evident from the high incidence of reported ill-health amongst the under-5 years in Delta State, which had over seventy-five percent 75% of reported cases by respondents.

A high number of respondents concur with consulting healthcare providers, and this shows a change in healthcare utilisation in the region (Table 4). The type of healthcare services rendered in health centres and hospitals indicates that most services are linked to maternal and child healthcare. Women's healthcare accessibility and utilisation are a function of the health needs of either mother or child. In rural areas, the most common healthcare services are rendered by Nurses/Midwives, who are the healthcare providers available in rural healthcare centres. Services such as prenatal care are cheap and affordable for most women.

Table 4: Type of Healthcare Services

HealthCare Service Delivery		**Delta State**	**Edo State**	**Total**
Maternal Healthcare				
Pre-natal Care	Tetanus Toxoid Injection	50	335	385 (16%)
	Prenatal check	1001	832	1833 (76%)
	Nutrition	95	58	153 (06%)
	Others	45	07	52 (02%)
Delivery Care	First Child	923	1057	1980 (82%)
	Second Child	1042	1135	2177 (90%)
	Third Child	1105	1194	2299 (95%)
	Fourth Child	1179	1219	2398 (99%)
Immunization	First Child	1127	1223	2350 (96%)
	Second Child	1191	1230	2421 (99%)
	Third Child	1189	1227	2416 (99%)
	Fourth Child	1191	1230	2421 (99%)
Childcare	Boy Child	846	973	1819 (75%)
	Girl Child	881	986	1867 (77%)
Family Planning		727	715	1442 (60%)
Total		**1191**	**1232**	**2423 (100%)**

Seventy-six percent (76%) of women in the region have routine prenatal checks during pregnancy. Another prenatal service is the tetanus toxoid injection at (16%); this is administered during antenatal clinics for pregnant women. Malaria check is among the other prenatal services rendered to mothers. Over ninety percent (90%) of women immunize their children under the age of 5 based on the provision of the health services. The girl-child has a slightly higher utilisation

of seventy-seven percent (77%) than the boy-child in the study area. Boy-child represents child healthcare utilisation with seventy-five percent (75%) of care received from government and private health centres and hospitals. Other forms of healthcare utilisation were unorthodox and comprised home treatment, homeopathy, traditional, and spiritual health practices in the region. Malaria and diarrhoea are particularly severe for infants and children, with diarrhoea causing a significant number of deaths in this age group, with poor health care management. Access to and use of healthcare are vital for reducing child and maternal mortality in the region. The high incidence of reported ill-health in children under five highlights the critical need for healthcare access in the region.

3.3: Women's Healthcare Accessibility and Utilisation

The factors influencing healthcare accessibility and utilisation are depicted in Table 5. Factors ranging from common illness, educational level of respondents, under-5years child immunization, child healthcare services, type of health provider, household size, place of childcare health services, perceived illness level of under-5years child/children, mental healthcare during and after COVID-19, decision-maker (autonomy), average monthly income, distance (foot), access to maternal health services during and after COVID-19, health insurance, family planning/sexual and reproductive healthcare services, use of prenatal health care, family healthcare services during and after COVID-19, marital status, residence, frequency of prenatal health care, under-5 years child delivery services, perceived illness level for household member(s) during and after COVID-19, age of respondents, and live births in the last 12 months were statistically significant at 0.05 level.

Table 5: Regression Model on Healthcare Utilisation

Model	R	R Square	R Adjusted Square	Std. Error of the Estimate
1	.880a	.775	.771	.239

*P- value at 0.05 level of Significance.

The twenty-four predictors were able to explain seventy-seven percent (77%) of access to healthcare during and after COVID-19 amongst the 2423 female respondents in the region. The regression Table 5 reveals an R^2 value of 0.777 and R of 0.808, which is statistically significant at a probability level of 0.05 and a good fit model. This implies that the multiple correlation coefficients indicate a strong positive relationship between the variables. A probability level of 0.05 indicates the model is statistically significant, meaning the relationship between the variables is unlikely to be due to random chance. The R-squared value shows that the selected predictor variables (common illness, educational level, child immunization, etc.) account for over 0.77% of the variation in the dependent variable. The R value of (0.808) indicates a strong, positive linear relationship between the independent variables and healthcare utilisation. The ANOVA model presented in Table 6 shows that the degree of freedom (Df) (36, 2386) has an F-value of 228.123, where $P < 0.05$.

Table 6: ANOVA[a]

Model	Sum of Squares	Degree of freedom (Df)	Mean Square	F	Sig.
Regression	468.746	36	13.021	228.123	.000b
Residual	136.187	2386	.057		
Total	**604.933**	**2422**			

a Dependent Variable: Access to Healthcare Services

The ANOVA results are statistically significant, suggesting that the independent variables have a significant effect on the dependent variable. The large F-value and the p-value less than 0.05 support the regression result in Table 5.

3.4: *Healthcare Utilisation Challenges during and after COVID-19*

The main challenge of respondents in the poor utilisation of healthcare services is the long waiting time experienced at these facilities in rural areas of the region (Table 7). This could lead those who do not patronise healthcare centres or hospitals to purchase drugs from pharmacies or medicine shops, leading to self-medication.

Table 7: Challenges for Poor Utilisation of Healthcare Services

Healthcare Challenges	Delta State	Edo State	Total
Unclean Facility/Environment	941	1072	2013 (83%)
Long waiting Time	1179	1182	2361 (97%)
Lack of Trained Personnel	24	30	153 (06%)
Cost of Treatment (Expensive)	127	106	233 (10%)
Lack of Drugs	602	601	1203 (50%)
Unsuccessful Treatment Plan	31	61	92 (04%)
Other Challenges	547	576	1123 (46%)
Total	**1191**	**1232**	**2423 (100%)**

The delay in receiving quality healthcare experienced at health facilities is a major reason for those who do not patronise any health facility. Healthcare facility's patronage is discouraged further by the delays in receiving medical attention from healthcare professionals. Delta State female respondents at ninety-nine (99%) percent and Edo State ninety-six (96%) percent claim that long waiting time is the major challenge they experience at healthcare facilities whenever they seek medical attention. Another challenge faced by respondents is unclean healthcare facilities and the environment, which discourages their patronage level whenever they visit such facilities. Delta State has seventy-nine percent (79%) and eighty-seven percent (87%) of the respondents in Edo State report that the dirty healthcare facility environment is a challenge. Fifty percent (50%) of respondents concur that the lack of drugs at the health facilities further discourages the use of healthcare centres in the rural areas of the region. Other challenges are a lack of money, travel safety, a lack of medical doctors in rural areas, non-functioning health centres, distances, and transportation costs.

4. Discussion

The results from this research depict that most respondents (81%) were between the ages of 40-49 and 20-39 years. These statistics explain that most females of this age group do not migrate out of the region when compared with women of the younger age groups. Fifty-four per cent (54%) of the respondents had secondary and tertiary education in the region. This shows slight improvement among the people in the region in terms of educational achievement, particularly in Delta State. The high number of respondents who claim to be married was over seventy-two percent (72%). This further explains the reason for non-migration among the older age groups of women. Agriculture and trading accounted for seventy-nine percent (79%) of the respondents' main occupations. This monitors the level of economic activities and development indicators of the rural areas in the region. Wealth distribution is synonymous with age and employment opportunities; in this circumstance, the type of employment status depicts individual earnings. Sixty-three percent (63%) of women are poorly remunerated in their main occupation, and twenty-one percent (21%) have no source of income. This comprises women who are engaged in unpaid household activities and those serving as family farm labourers.

Malaria, which is an endemic illness in the country, is the most prevalent illness in this region. Under-5 years ill health is also highly prevalent, leading mothers to seek healthcare services. This agrees with [3] that the absence of child healthcare is a barrier to mothers utilising healthcare facilities. The types of healthcare services identified by the women include prenatal checks for pregnant women. Delivery care services and child immunisation for first to fourth births also had high percentages. This clearly shows a high fertility rate among reproductive women in the research area. Older children's healthcare also promotes high healthcare facility patronage. Family planning was also a notable service for Delta State women than in Edo State.

In analysing the access and utilisation of healthcare services, the identified predisposing variables, such as residence, age, education, household size, and decision-making (autonomy) for most women, contributed to the seventy-seven percent patronage of the healthcare centre or hospital in rural areas of this research. The individual demographic and socio-cultural constraints are related to the predisposing variable affecting women's health care utilisation. The unusually high utilization of healthcare facilities (77%) by rural women in the Niger Delta is likely driven by a complex combination of enabling factors, rather than the deterrents typically observed in similar rural contexts. In this setting, variables such as residence, age, education, household size, and decision-making autonomy may function differently compared to studies reporting lower utilization rates. Age appears to be a significant contributor to increased healthcare service use, potentially reflecting the impact of targeted healthcare programs and health literacy initiatives that reach women across all age groups. Higher educational attainment among women consistently correlates with better health-seeking behaviours and greater acceptance of modern medical practices. Enhanced health literacy among rural women is associated with improved access to and use of healthcare services. The educational level of a woman's husband can also influence her healthcare decisions, with higher education in partners often linked to increased support for formal healthcare use. Although larger households may provide additional support, smaller family sizes are generally associated with better health outcomes for women and greater use of skilled medical personnel, as reduced financial strain allows for more resources to be allocated to healthcare. Greater autonomy in decision-making is a critical predictor of healthcare utilization. Additionally, joint decision-making between spouses regarding household finances or healthcare can further increase the likelihood of facility visits. There is a strong association between a woman's control over her earnings and her ability to access quality maternal care, as financial autonomy removes the challenge to healthcare access. This is similar to the findings by other researchers in low and middle-income countries [6, 9-10, 20].

The enabling factors measure women's available resources in accessing healthcare services. Income, distance, insurance, type of health provider, place of childcare, and perceived illness level for under-5-year-olds, older children, and household members. [5, 58-59] deduced that economic status affects women's access to healthcare, especially among low-income earners. The health-related factors among these variables also influence women's access to and use of these rural healthcare centres and hospitals [11, 12]. Availability of quality healthcare centres or hospital facilities is not only present but must also be seen as accessible and reliable. In typical rural areas, distance is a significant barrier. A high patronage rate implies an effective distribution of health services. Improved rural infrastructure with better road networks and transport systems would make it easier for women to reach healthcare facilities, which is a major challenge in many underserved areas. Affordability and reduced costs, which entail programs that offer free or subsidized healthcare services, like free maternal and child health services in some States, are powerful incentives [58-59]. High patronage could stem from initiatives that remove the financial barrier of out-of-pocket payments.

The need factors assess women's perception of the use of healthcare services. The major identified factors relate to women's general health status and the significance of an individual's illness symptoms. This research analysed factors such as the general family healthcare, common illnesses, mental health, live births, maternal services, prenatal services, delivery services, family planning services, immunisation, and access to healthcare during COVID-19. Improved quality

of care, including a good attitude from health workers and adequate medical equipment, can build trust and attract more patients [59]. Targeted health interventions with effective outreach programs, community health promotion campaigns, and the deployment of more skilled health workers in rural areas can significantly improve utilization. Women who are exposed to media are more likely to utilize health services, as they gain vital health information from broadcasts. This could explain a shift towards higher health facility patronage. All three categories of factors (predisposing, enabling, and need) were synonymous with those of other research findings in Africa and Nigeria [30-32. 58-59]. Women require both physical and psychological needs to access good healthcare [21].

This research considers the mental health and perception of illness, as well as access to healthcare during and after the pandemic. This is also supported by [4] report on women's need for mental health and physical well-being, which has increased after the COVID-19 pandemic. Women in the selected research area stated that the main hindrance they encounter in utilising healthcare services is the delay tied to the long waiting time at healthcare centres and hospitals [26, 58]. Medical interventions at healthcare facilities are required to be timely and effective to encourage continuous patronage of such facilities. Before the COVID-19 pandemic, this finding on delay experienced is similar to [33] research on maternal healthcare utilisation in Edo State. The unhealthy state of healthcare facilities/environment and the lack of drugs further discourage utilisation [47-49, 57]. Conducive and timely services positively influence the utilisation of healthcare facilities. Other limitations are those that women encounter before getting to healthcare centres or hospitals, which include distance and transportation costs, finance, as well as a lack of fully functioning healthcare facilities and providers.

5. Conclusions

The challenges of healthcare accessibility and utilisation are still quite numerous, particularly for rural women. After the pandemic, there has been greater awareness and advocacy for timely medical interventions in health-related illnesses. Women face more of the burden due to the constraints they face as rural low-income earners. The social norms and culture still disempower most women who are financially dependent on their spouse's support and low income to better manage their family healthcare needs. The region has a high number of women who earn below a dollar per day, and they are fairly literate, and engage in primary activities resulting in poor remuneration. Over time, there has been an increase in poverty due to unpaid activities and poor economic empowerment. These women are faced with limited healthcare services in rural communities and make selective decisions as regards their health needs. Common in rural communities are nurses/midwives who offer mostly maternal and child health services. Other chronic health challenges are left to referrals to higher-tier healthcare facilities, which are found in the urban areas.

Enhancing women's productivity and livelihood will boost women's earning capability. Improvement in the social infrastructure, particularly in the area of decision-making and insurance registration, will create better utilisation for women on daily medications. The reduction in unpaid household activities will promote gender equality in the region. Prioritising primary healthcare facilities, programs, services, personnel, and coverage is the bedrock of improving rural women's health. Reliance on rural health workers and telehealth/medicine will meet the needs of remote rural women. Overall improvement in the healthcare system is tantamount to mother, infant, children, and household members' utilisation. Healthcare insurance or medical aids and quality healthcare are necessary for improved rural women's health needs. There is an urgent need to tackle the social and economic challenges posed by the COVID-19 pandemic, especially among rural women who bear more of the poor healthcare. Government and community policies/interventions will foster better healthcare at the grassroots (Primary Healthcare Centres). Better women's well-being and mental health promote healthier households.

This study was restricted to two states in the Niger-Delta region; a more comprehensive coverage is needed to assess women's healthcare utilisation in the region. Also, the inclusion of the qualitative analysis will provide better insights

about the pre-COVID-19 and post-COVID-19 pandemic effects on healthcare accessibility and utilisation, and thus, it is recommended for implementation in other publications.

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