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Comparative assessment of costs of household trips to healthcare facilities in contiguous riverine regions in Rivers State, Nigeria

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Abstract

Physical access to neighbourhood facilities for utilization depends on distance, time and cost factors in relation to location characteristics. In this study the costs of accessing healthcare facilities in island riverine contiguous regions of Rivers State, Nigeria were considered. The study employed the survey research design following quantitative approach for data collection and analyses. Furthermore, the multistage sampling technique employed and 30% (66) communities of total communities of 223 in the study area was purposively determined. Also sample size of (56,131) households was obtained from total population of 305, 289 of the study area as provided by 1991 National Population Census data by application of Krejcie and Morgan Model (1970) principle and 5 persons average household considered. Finally, the random sampling technique was used in selection of communities for administration of questionnaires in the study area. A total of 382 respondents (household heads) were interviewed including key informants (government agencies and professionals). Other survey tools used were photographs, observations, Stock-watch and Geographic Positioning System (GPS) Speedometer. 328 questionnaires were retrieved from the field and considered valid for analysis with the aid of Statistical Package for Social Sciences (SPSS). Hypotheses were tested by the application of the multi regression model. It was found in traveling for healthcare, an aggregate of 21.4% of household members in the region monthly made trips in communities with and without PHC facilities with multi-modal transport systems at varied costs.

Keywords: Household; Healthcare; Riverine; Region

1. Introduction

The WHO in 1978 declared at Alma-Ata in Kazakhstan that Primary Healthcare (PHC) system is 'essentially based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination'. The goal was to close the gap between the healthcare of 'haves' and 'have-nots', with a view to achieving more equitable distribution of health resources, and attain a level of health for all the citizens of the world (WHO, 1978).

This was a declaration that urgently echoed the importance of healthcare on all governments, health and development workers and the world community to take action to provide for the health of all peoples of the world. The PHC evolves from the economic, socio-cultural and political characteristics of countries. It is 'based on the application of the relevant results of social, biomedical and health services research of public health experience by mainly addressing the health

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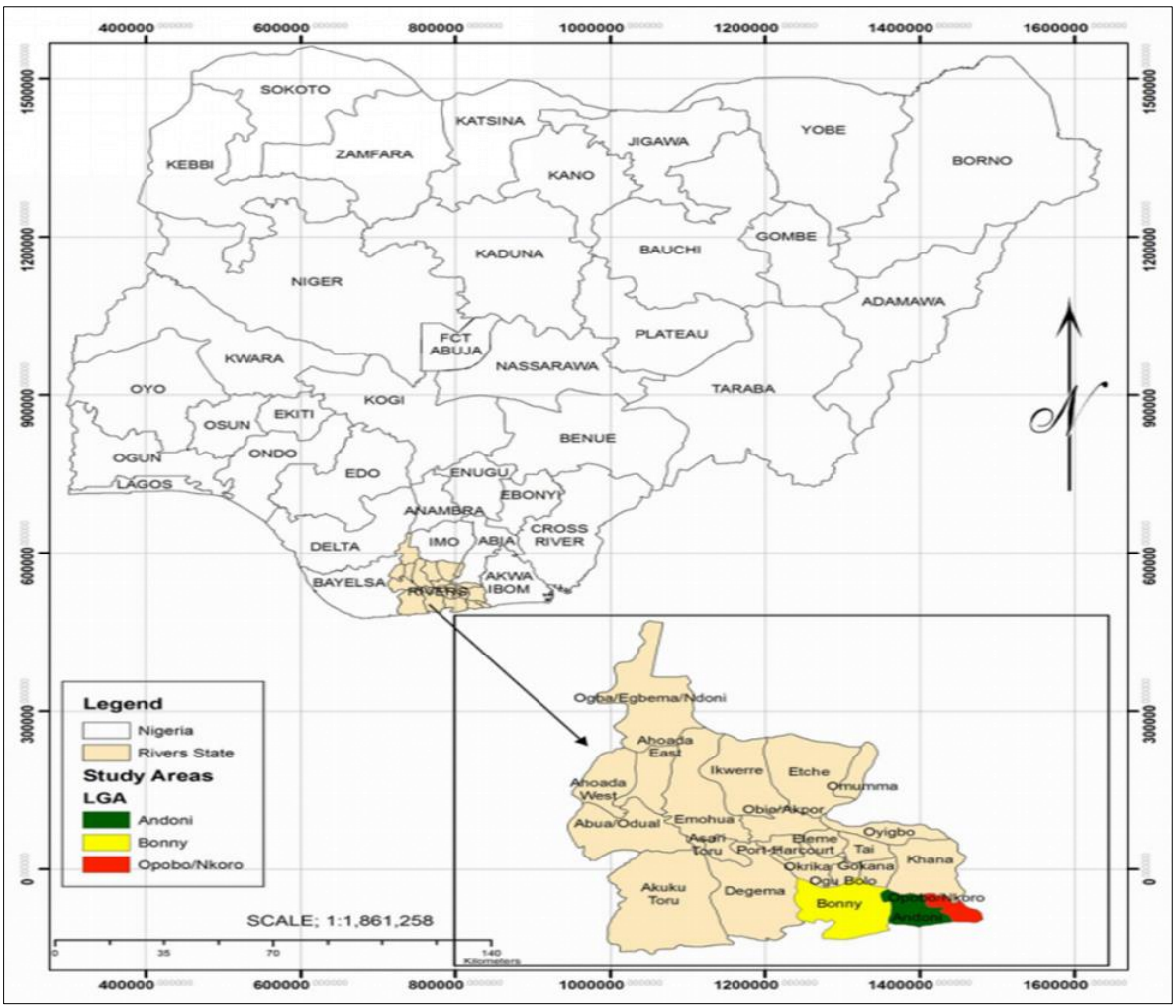
problems in the countries by providing, promotive, preventive, curative and rehabilitative services' (WHO, 1978). PHC was endorsed in 1978 by the WHO member countries as a paradigm designed to reduce inequities in health and partly through enabling universal access to health services (Rasanathan, Montesinos, Matheson, Elienne and Evans, 2009).

According to the World Health Organization (WHO) and United Nations Children's Fund (UNICEF), 2018), PHC is a whole-of-society approach to health that aims to ensure the highest possible level of health and wellbeing and their equitable distribution by focusing on people´s needs and preferences (as individuals, households and communities) as early as possible along the continuum from health promotion, disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment. As part of the consensus, all government were instructed to formulate national policies, strategies and plans of action to launch and sustain primary healthcare as part of a comprehensive national health system and in coordination with other sectors. In another perspective, ' health is associated not only with the physiological functioning but with mental and moral soundness and spiritual salvation'. The health status of the population in any country is important and can be used to determine the level of development of that country over time. Globally, the first five countries that have the best access to PHC as ranked by WHO in 2020 were France (1st), Italy (2nd), San Marino (3rd), Andorra (4th) and Malta (5th) (World Population Review (WPR), 2021). It was observed that no Asian and African countries were in the best 5 ranked countries in terms of access to PHC.



Source: Researcher's Conceptualization, 2024 www.mapsofworld.com – updated (2019)

Figure 1 The Study Areas

The healthcare systems in Nigeria include the tertiary, secondary and primary healthcare systems. The management of these healthcare systems is the responsibility of the federal, state and local governments having ministries of health and local health sector at the various levels. The private sector also renders support healthcare services which are managed by private providers, individuals and corporate organizations. The Primary Healthcare System is the third tripod of the three major healthcare systems and is meant to service the household which is defined as 'an individual, two or group of persons living together, who make common provision for food and other essential for living' (United Nations (UN),

1989). In this case the households in the riverine regions were of primary interest and access is fundamental to the success of the PHC.

Rivers state which is within Latitude $4^{o}45^{1}$N and Longitude $6^{o}50^{1}$E is a state in the Niger Delta region of Nigeria and most towns and villages especially in the riverine areas can only be physically accessed through the creeks and rivers by watercrafts such as canoes and small engine boats (locally called outboard engine boats and speed boats). Access which is geographic in this case, is a measure of travel cost. The study in this regard considered selected contiguous riverine regions namely Opobo/Nkoro, Bonny and Andoni having 223 communities serviced with 43 PHCs (Ministry of Budget and Economic Planning, Rivers State, 2009) (see fig 1. 2 and table 1). Contiguity of communities is a unique characteristic of rural settlement pattern in these regions having their coast lines on the Atlantic Ocean. The regions are bounded on the North by Khana, Gokhana, Ogu/Bolo and Okrika LGAs, to the South by the Atlantic Ocean, to the East by Calabar River and to the West by Degema LGA. They are in the Niger Delta basin crisscrossed by a system of rivers and creeks. Their coastlines form part of the West African coastlines.

1.1. Issue

The three contiguous regions by geographic locations are vulnerable to physical and environmental constraints that impede movement. Elisa (2020) averred that health equity is about creating a system where all individuals have equitable access to quality health outcomes. The major challenge among others in the study regions is the ease with which the household's access healthcare facilities as an essential public facilities spatially located in the areas for prompt attentions when healthcare services are needed. According to The World Bank (2017) noted that more than three and half billion people lack access to essential healthcare facilities and Sara (2018) affirmed that as many as 57 million currently lived in rural areas in America and remote geographic location, small size, limited workforce, physician shortages and financial resources often pose a unique set of challenges for rural healthcare facilities.

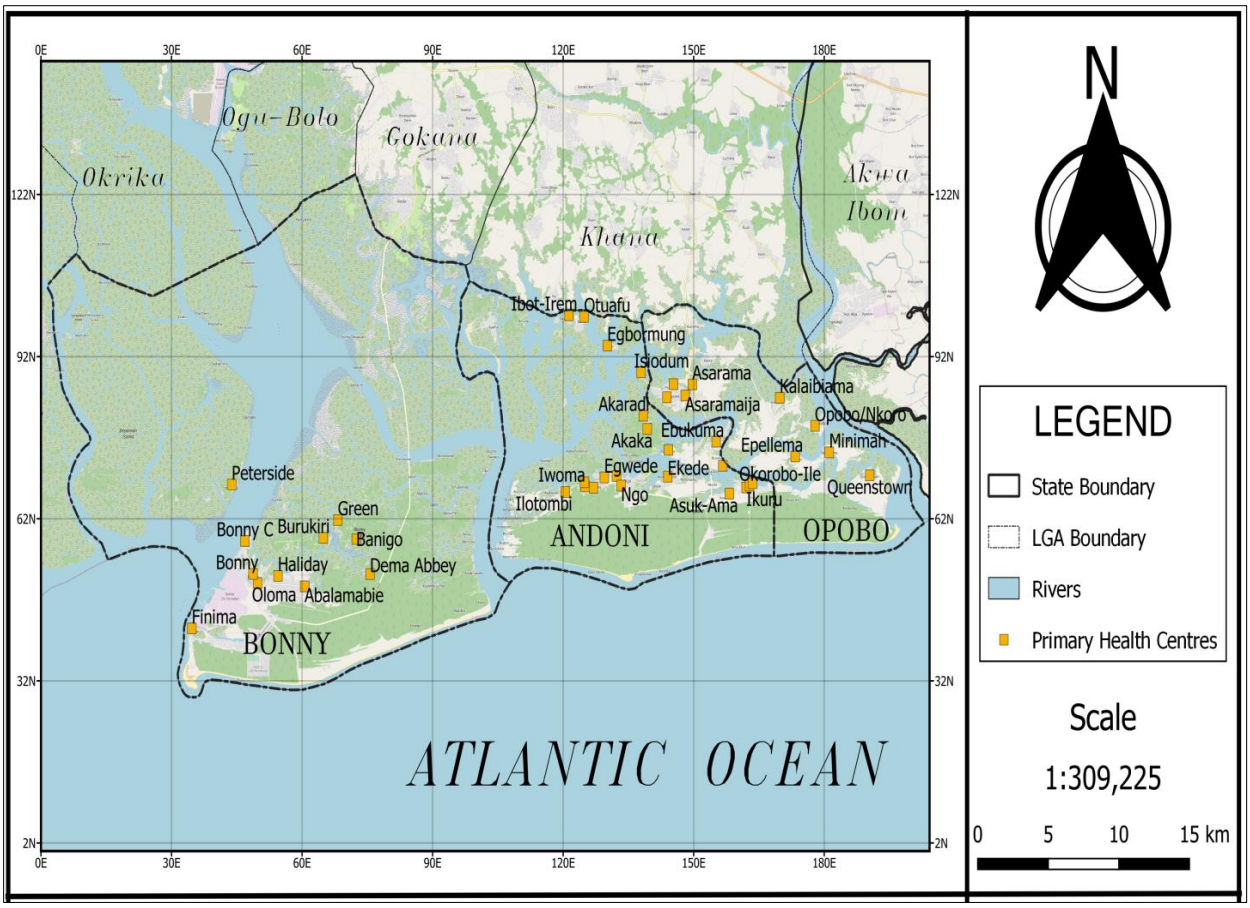
In the study regions, the PHC facilities which were provided in some communities were meant to service other communities that do not have these facilities. However, it was not clear whether the ease of access to these facilities were given appropriate consideration. Households accessing PHC facilities through the water mode seemed problematic in meeting health needs. More apparently difficult was handling health related emergencies and referrals patients in these regions as they depended on the available means and modes of transport to the required healthcare facilities as at when needed. *The right means of transport for trips, time, costs as at when needed* referred to the speed at which an emergency patient arrived at the healthcare facilities for medical attention. It was observed governments (local and state) no longer provide and manage public marine transport services in the state. Communities in riverine regions rely on small private boat operators to meet their needs. These operators are totally responsible for the management of the entire marine transport system.

Table 1 Total Numbers of Primary Healthcare Facilities and Locations in the Study Area

Primary Healthcare Centres in the Study Area						
Opobo/Nkoro			**Bonny**		**Andoni**	
Healthcare Facility		**Location**	**Healthcare Facility**	**Location**	**Healthcare Facility**	**Location**
1	Model Primary Health Centre	Opobo/Nkoro	Primary Health Centre	Abalamabie	Comprehensive health Centre	Unyengala
2	Model Primary Health Centre	Queens Town	Primary Health Centre	Haliday	Primary Health Centre	Isiodum
3	Model Primary Health Centre	Nkoro	Primary Health Centre	Banigo	Primary Health Centre	Ebukuma
4	Primary Health Centre	Minimah	Primary Health Centre	Burukiri	Primary Health Centre	Ilotobi
5	Comprehensive Health Centre	Epellema	Primary Health Centre	Oloma	Primary Health Centre	Otuafu
6	Model Primary Health Centre	Kalabiama	Primary Health Centre	Green	Primary Health Centre	Ikuru

7			Primary Health Centre	Bonny	Primary Health Centre	Ekede
8			Primary Health Centre	Dema Abbey	Primary Health Centre	Akakajak
9			Primary Health Centre	Peterside	Primary Health Centre	Agbalama
10			Comprehensive Health Centre	Bonny	Primary Health Centre	Agwut-Obolo
11			Primary Health Centre	Finima	Model Primary Health Centre	Unyeada
12					Primary Health Centre	Oyorokoto
13					Primary Health Centre	Okoroboile
14					Primary Health Centre	Asarama
15					Primary Health Centre	Egendem
16					Primary Health Centre	Egwede
17					Primary Health Centre	Ngo
18					Primary Health Centre	Akaradi
19					Primary Health Centre	Asukama
20					Primary Health Centre	Asaramaija
21					Primary Health Centre	Inyongorong
22					Primary Health Centre	Iwoma
23					Primary Health Centre	Iboritirem
24					Model Primary Health Centre	Ataba
25					General Hospital	Ngo
26					Primary Health Centre	Egbormung

Source: Rivers State Ministry of Health, 2024



Source: Satellite Imagery - Digitized by Researchers, 2024

Figure 2 Locations of Communities with Primary Healthcare Facilities in the Study Area

Aim

The aim of the study was to assess costs of households' trips to primary healthcare facilities in riverine regions in Rivers State.

Objectives of the Study

The study objectives were:

- Ascertain the number healthcare facilities in the study regions.
- Identify the available transportation means to access primary healthcare facilities by households in the selected riverine communities.
- Determine the accessibility needs of households to primary healthcare facilities in terms of travel costs of households in the regions.

1.2. Research Hypotheses

The hypothesis set for this study was as followed:

- H_0 –There is no significant relationship between the regional travel costs and frequency of trips to healthcare facilities in the study area.

1.3. Literature

1.3.1. Households' Healthcare Access Needs - Travel Costs

Economic accessibility is linked to the costs of services in relation to individual's socio-economic status. In healthcare, this can be viewed as the options available for specific groups of people to move and enter to use specific facility for

service in the health sector. These can be interpreted to mean physical, social and economic and may have negative or positive impacts on accessing facilities.

1.3.2. Travel Cost

A household is constrained both by its budget which includes a time budget, because time spent obtaining health care can be traded off against competing uses of time, both for labour and leisure and by available medical technology (Harold & Victor, 1996). A trade-off can occur at lighter levels of healthcare demand by household. The Global Health Statistics in Eric *et al* (2018) indicated that private health expenditure (PHE) in 2012 remained as high as 62.4% in low income countries and 66% in lower income countries and in lower middle income countries compared with 40.7% in higher income countries. It noted again that out-of-pocket payment of total PHE for this same period remained as high as 77.6% for low income countries and 86.7% for low middle income countries compared with 38.5% in high income countries. It concluded that the proportion of PHE depicts that the large global population continue to face financial burden to healthcare facilities due to out-of-pocket. In response, WHO in 2015 resolved to tax member states to ensure universal health financing through the removal of out-of–pocket for accessing healthcare facility. To this end, the use of prepayment system was recognized as effective means to remove financial burden to access health facility especially among the poor and vulnerable population.

1.3.3. The Concept of Riverine Region

In a broad sense, riverine is anything that is related to rivers and river systems. This involves the vegetation, islands and wetlands that are contained within a channel of river, creeks or waterways and associated streams giving rise to an interconnected and interrelated functional ecological whole peculiar to a geographic space. It is an inland or coastal area comprising both land and water characterized by limited land lines of communication, with extensive water surface and or inland water ways that provide natural routes for surface transportation and communications (Dictionary of Military and Associated Team, 2005). As 'riverine system is characterized by unidirectional flowing water, erosion and downstream transportation and deposition of sediments and links to flood plains'. Others are catchment areas that are made up of branching network of streams and rivers that are in dynamic equilibrium with the landscape and its climate and finally the catchment areas connect the landscape and the sea.

The landscapes are island areas formed as a result of deposition by the connection two rivers and it is on these islands riverine communities develop. A community is a group of people who communicate and reside in the same geographic area with common basic condition of life (Anyawu, 1981). The group of people may be a village, a household or tribe sharing a common territory, belief and culture as obtainable of the households in the study area. Hence, a riverine community as conceived in this study is a group of people who reside in islands and whose communal lives depend on the river systems of the area.

2. Methodology

The study employed the survey research design following quantitative approach in data collection and analyses. Furthermore, the multistage sampling technique employed and 30% (66) communities of total communities of 223 in the study area was purposively determined. Also sample size of (56,131) households was obtained from total population of 305, 289 of the study area as provided by 1991 National Population Census data by application of Krejcie and Morgan Model (1970) principle and 5 persons average household considered. Finally, the random sampling technique was used in selection of communities for administration of questionnaires in the study area. Other survey tools used were photographs, observations and Geographic Positioning System (GPS). 328 questionnaires out of 400 administered were retrieved from the field and considered valid for analysis with the aid of Statistical Package for Social Sciences (SPSS). Hypotheses were tested by the application of the multi regression model as stated below:

2.1. Multiple Regression Model

The MRM as stated below considered Access as a dependent variable and travel distance and travel time as independent variables.

$$Y = f(X_1),\ i = 1 \ldots\ldots\ldots\ldots n)$$

$$Y = f(X_1, X_2, X_3 \ldots\ldots\ldots\ldots\ldots Xn)$$

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \cdots b_nX_n + e \ldots\ldots\ldots eq\ldots\ldots\ldots\ldots (1)$$

$$Y_i = a + b_1X_{1i} + b_2X_{2i} + b_3X_{3i} + \cdots b_nX_{ni} + e_i \text{.....eq} \ldots\ldots\ldots\ldots\ldots(2)$$

- Y_{1i} = frequency of trips to primary health care facilities.
- X_{1i} = travel Costs in Andoni Region.
- X_{2i} = travel Costs in Opobo/Nkoro Region
- X_{3i} = travel costs in Bonny Region

Where

- $X_1, X_2, X_3 \ldots\ldots\ldots\ldots\ldots\ldots X_n$ were independent variables
- $b_1, b_2, b_3 \ldots\ldots\ldots\ldots\ldots\ldots b_n$ were multiple regression coefficient of independent variables
- a = was the intercept on the y – axis
- e_i = was the error terms.
- y = dependent variable (Access).

To identify the effect of the independent variables on the dependent variable in MRM the coefficient of determination (R^2); the correlation coefficient was ascertained and used to compute for the dependent variable based on the combined effects of the independent variables. Data were also analyzed

2.2. Data

Table 2 Frequency of Trips by Household Members in Communities with and without PHC to PHC Facilities

S/N	Period of Ill-health	Andoni		Opobo/Nkoro		Bonny		Aggregate	
		N	%	N	%	N	%	N	%
1	Daily	8	4.1	5	8.4	-	-	13	4.2
2	Weekly	42	21.8	3	5.1	5	9.3	50	16.2
3	Twice in a week	51	26.4	1	1.7	7	13.0	59	19.1
4	Monthly	38	19.7	18	30.5	10	18.5	66	21.4
5	Twice monthly	9	4.7	3	5.1	9	16.7	21	6.8
6	Quarterly	18	9.3	7	11.9	14	25.9	39	12.6
7	Yearly	27	14.0	4	6.8	9	16.6	40	12.9
8	Others	-	-	18	30.5	-	-	18	5.8
	Total	193	100	59	100	54	100	306	100

Source: Researcher's Field Survey, 2024

Table 3 Monthly Average Cost of Accessing PHC Facility by Households in Andoni Communities with PHC

S/N	Fare in Naira (₦)	Andoni												
		Means of Transport									Total Respondents	%	Total (₦)	Ave. (₦)
		OBE	HPC	MC	OBW	BC	B	T	F	PC				
1	< 1,000 (500)	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1,000	-	-	4	-	-	-	-	-	-	4	10.8	4,000	4,000
3	2,000	-	-	7	-	-	-	-	-	-	7	18.9	14,000	14,000
4	3,000	-	-	-	-	-	-	-	-	-	-		-	-

5	4,000	-	-	6	-	-	-	-	-	-	6	16.2	24,000	24,000
6	5,000	-	-	9	-	-	-	-	-	-	9	24.3	45,000	45,000
7	6,000	-	-	5	-	-	-	-	-	-	5	13.5	30,000	30,000
8	7,000	-	-	-	-	-	-	-	-	-	-		-	
9	8,000	-	-	3	-	-	-	-	-	-	3	8.1	24,000	24,000
10	9,000	-	-	3	-	-	-	-	-	-	3	8.1	27,000	27,000
11	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-
12	11,000	-	-	-	-	-	-	-	-	-	-	-	-	-
13	11+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	37	-	-	-	-	-	-	37	100	168,000	24,000

Source: Researcher's Field Survey, 2024 ***Out board engine fiber Speed boat (OBE), Hand pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F), Private car (PC)

Table 4 Monthly Average Cost of Accessing PHC Facility by Households in Andoni Communities without PHC

S/N	**Fare in Naira (₦)**	**Andoni**												
		Means of Transport									**Total Respondents**	**%**	**Total (₦)**	**Ave. (₦)**
		OBE	**HPC**	**MC**	**OBW**	**BC**	**B**	**T**	**F**	**PC**				
1	< 1,000 (500)	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-
3	2,000	-	2	18	7	-	1	-	-	-	28	48.3	56,000	14,000
4	3,000	-	3	-	-	-	-	-	-	-	3	5.2	9,000	9,000
5	4,000	-	-	11	2	-	1	-	-	-	14	24.1	14,000	4,666
6	5,000	-	7	-	-	-	-	-	-	-	7	12.1	35,000	35,000
7	6,000	-	3	-	-	-	-	-	-	-	3	5.2	18,000	18,000
8	7,000	1	-	-	-	-	-	-	-	-	1	1.7	7,000	7,000
9	8,000	1	-	-	-	-	-	-	-	-	1	1.7	8,000	8,000
10	9,000	-	-	-	-	-	-	-	-	-	-	-	-	-
11	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-
12	11,000	1	-	-	-	-	-	-	-	-	1	1.7	11,000	11,000
13	11,000+	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	3	15	29	9	-	2	-	-	-	58	100	135,500	15.055

Researcher's Field Survey, 2024 ***Out board engine fiber Speed boat (OBE), Hand pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F), Private car (PC)

Table 5 Monthly Average Cost of Accessing PHC Facility by Households in Opobo/Nkoro Communities with PHC

S/N	Fare in Naira (₦)	Opobo/Nkoro												
		Means of Transport									Total Respondents	%	Total (₦)	Ave. (₦)
		OBE	HPC	MC	OBW	BC	B	T	F	PC				
1	< 1,000(500)	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-
3	2,000	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3,000	-	-	-	-	-	-	-	-	-	-	-	-	-
5	4,000	-	-	-	-	-	-	-	-	-	-	-	-	-
6	5,000	-	-	1	-	-	-	-	-	-	1	14.2	5,000	5,000
7	6,000	-	-	-	-	-	-	-	-	-	-	-	-	-
8	7,000	-	3	-	-	-	-	-	-	-	3	42.9	21,000	21,000
9	8,000	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9,000	-	-	-	-	-	-	-	-	-	-	-	-	-
11	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-
12	11,000	3	-	-	-	-	-	-	-	-	3	42.9	33,000	33,000
13	11+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	3	3	1	-	-	-	-	-	-	7	100	59,000	19,666

Source: Researcher's Field Survey, 2024 ***Out board engine fiber Speed boat (OBE), Hand pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F), Private car (PC)

Table 6 Monthly Average Cost of Accessing PHC Facility by Households in Opobo/Nkoro Communities without PHC

S/N	Fare in Naira (₦)	Opobo/Nkoro												
		Means of Transport									Total Respondents	%	Total (₦)	Average (₦)
		OBE	HPC	MC	OBW	BC	B	T	F	PC	N			
1	<1,000 (500)	1	-	1	-	-	-	-	-	-	2	18.1	1,000	500
2	1,000	1	-	-	-	-	-	-	-	-	1	9.1	1,000	1,000
3	2,000	-	3	-	-	-	-	-	-	-	3	27.3	6,000	6,000
4	3,000	3	-	-	-	-	-	-	-	-	3	27.3	9,000	9,000
5	4,000	-	-	-	-	-	-	-	-	-	-	-	-	-
6	5,000	2	-	-	-	-	-	-	-	-	2	18.1	10,000	10,000
7	6,000	-	-	-	-	-	-	-	-	-	-	-	-	-
8	7,000	-	-	-	-	-	-	-	-	-	-	-	-	-
9	8,000	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9,000	-	-	-	-	-	-	-	-	-	-	-	-	-

11	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-
12	11,000	-	-	-	-	-	-	-	-	-	-	-	-	-
13	11+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	7	3	1	-	-	-	-	-	-	11	100	27,000	5,400

Source: Researcher's Field Survey, 2024 ***Out board engine fiber Speed boat (OBE), Hand pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F), Private car (PC)

Table 7 Monthly Average Cost of Accessing PHC Facility by Households in Bonny Communities with PHC

S/N	Fare in Naira (₦)	Bonny												
		Means of Transport									Total Respondents	%	Total (₦)	Average (₦)
		OBE	HPC	MC	OBW	BC	B	T	F	PC	N			
1	<1,000 (500)	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1,000	-	1	1	-	-	-	-	-	-	2	7.1	2,000	1,000
3	2,000	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3,000	2	-	3	-	-	-	-	-	-	5	17.9	15,000	7,500
5	4,000	-	1	1	1	-	-	-	-	-	3	10.7	12,000	4,000
6	5,000	3	-	2	-	-	-	-	-	-	5	17.9	20,000	10,000
7	6,000	-	-	3	-	-	-	-	-	-	3	10.7	18,000	18,000
8	7,000	-	-	-	-	-	-	-	-	-	-	-	-	-
9	8,000	1	1	-	-	-	-	-	-	-	2	7.1	16,000	8,000
10	9,000	1	-	-	2	-	-	-	-	-	3	10.7	27,000	13,500
11	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-
12	11,000	5	-	-	-	-	-	-	-	-	5	17.9	55,000	55,000
13	11+		-	-	-	-	-	-	-	-	-	-	-	-
	Total	12	3	10	3	-	-	-	-	-	28	100	165,000	20,625

Source: Researcher's Field Survey, 2024 ***Out-board engine fiber Speed boat (OBE), Hand-pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F), Private car (PC)

Table 8 Monthly Average Cost of Accessing PHC Facility by Households in Bonny Communities without PHC

S/N	Fare in Naira (₦)	Bonny												
		Means of Transport									Total Respondent	%	Total (₦)	Average (₦)
		OBE	HPC	MC	OBW	BC	B	T	F	PC	N			
1	<1,000 (500)	-	-	9	-	-	-	-	-	-	9	12.9	4,500	4,500
2	1,000	-	1	11	-	-	-	-	-	-	12	17.1	12,000	6,000
3	2,000	1	4	-	-	-	-	-	-	-	5	7.1	10,000	12,500

4	3,000	-	1	3	-	-	-	-	-	-	4	5.7	12,000	6,000
5	4,000	-	3	-	-	-	-	-	-	-	3	4.3	12,000	6,000
6	5,000	8	1	-	-	-	-	-	-	-	9	12.9	45,000	22,500
7	6,000	-	-	-	-	-	-	-	-	-	-	-	-	-
8	7,000	-	3	-	-	-	-	-	-	-	3	4.3	21,000	10,500
9	8,000	7	2	-	-	-	-	-	-	-	9	12.9	72,000	36,000
10	9,000	6	-	-	-	-	-	-	-	-	6	8.6	54,000	54,000
11	10,000	5	-	-	-	-	-	-	-	-	5	7.1	50,000	50,000
12	11,000	5	-	-	-	-	-	-	-	-	5	7.1	55,000	55,000
13	11+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	32	15	23	-	-	-	-	-	-	70	100	347,500	31,590

Researcher's Field Survey, 2024 ***Out board engine fiber Speed boat (OBE), Hand pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F), Private car (PC)

3. Result

It was found in traveling for healthcare, an aggregate of 21.4% of household members in the region monthly made trips in communities with and without PHC facilities by Out-board engine fiber Speed boat (OBE), Hand-pulled canoe (HPC), Motorcycle (MC), Out-board engine wooden boat (OBW), Bicycle (BC), Bus (B), Taxi (T), Foot (F) and Private car (PC) (table, 2). Specifically in Andoni region, communities with PHC facilities households predominantly used Motorcycle means of transport to make trips to PHC for healthcare at average highest costs of ₦45,000 monthly and in communities without PHC facilities, households spent an average of ₦35,000 monthly.

In Opobo/Nkoro region households in communities with spent ₦33,000 in average monthly to make trips while ₦10,000 was spent by households in communities without PHC monthly to make trips to PHC for healthcare (table,4 and 5). In Bonny region, both communities without and with PHC facilities, households spent an average sum of ₦55,000 for healthcare trips monthly. Generally, it was observed that households trips making for healthcare to an extent were influence by available means of transport as at when needed and apathy.

However, results of the analysis in table 9 explained that travel cost significantly predicted frequency of trips to healthcare facilities by households at $F(1, 39) = 3.269$, $p = 0.048 < 0.05$, $R^2 = 0.177$. This means there is a significant relationship between travel cost and frequency of trips to healthcare facilities by households.

Table 9 Relationship between the Travel Costs and Frequency of Trips by Households

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4357.155	1	4357.155	3.269	.048b
Residual	51960.455	39	1332.832		
Total	56337.610	40			

a. Dependent Variable: Frequency of Trips by Household Members; b. Predictors: (Constant), Costs (₦) of Access Primary Healthcare Facilities by Households Source: SPSS Version 22

4. Conclusion

Travel costs in accessing PHC by households in contiguous regions in Rivers State as assessed in this study has highlighted some salient issues in accessing PHC facility by people living in this peculiar area of the state. The riverine regions in Rivers State are basically islands communities with more of vulnerable population group engage in fishing with less formal education. They use multi-modal transportation system through meandering creeks, rivers and sea in conjunction with land to access PHC facility at all times. It was found that there is a significant relationship between travel cost and frequency of trips to healthcare facilities by households (see table, 2 and 9). It means the more household

embarked on trips to PHC the higher the costs. The costs of distances and time involve in the process sometimes outweigh their income.

The study also divulged information on the means of transportation and predominant modes of transport used by people in accessing PHC facility and finally it revealed the problems encountered by the people of the riverine communities when accessing PHC facilities located in the area in times of need showing that effective access to PHC depends on not only location and provision of PHC facility but also on traveled time, traveled distance and traveled costs as well as means of transport used by the people of the riverine communities.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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